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THE PRACTICE OF MEDICINE

THE

PRACTICE OF MEDICINE

5-25-70

BY

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The highest aim of healing is the speedy, gentle, and permanent restitution of health, or alleviation and obliteration of disease in its entire extent, in the shortest, most reliable, and safest manner, according to clearly intelligible reasons. — HAHNEMANN.

SECOND EDITION.

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PREFACE.

THE aim of this book is to present to the physician the most practical way of treating disease by medicinal and hygienic methods. To do this I have drawn upon my experience as a general practitioner for forty years; and upon the experience and observation of my colleagues of all schools of practice, so far as I believed them trustworthy. I entertain the broad belief that while the law of *Similia* is the chief guide in the selection of drugs, there are other methods of cure which should not be neglected. While I believe the application of the law of *Similars* is very wide, I know that it has its limitations; that remedial medicaments which act chemically and physiologically cure some diseases promptly and safely. In the light of our present knowledge of ferments and micro-organisms, we know that many diseases require medicines which destroy the germs which are the cause of diseases; and that unless such agents are used conjointly with strict aseptic measures the most carefully chosen medicines are powerless to cure.

It is my conviction that the physician who selects his remedies in accordance with the law of *Similia*, and by their primary symptoms alone, narrows his therapeutic resources, and deprives his patients of means of cure which it is his duty to apply. By clinging to one and rejecting all other methods of cure, the physician fails in his duty to his patients.

If I have quoted freely from writers of all systems of practice, I have done so because I have desired to give the best information at present attainable, and I have been careful to give due credit to all authorities.

This is an era of preventive medicine. The physician who pre-

vents disease is worthy of equal, if not more, honor than one who cures. Therefore I have made hygiene as prominent as medicinal therapeutics. In relation to dose, I have left the size and repetition to the individual experience and observation of the practitioner, except in cases where my own experience warranted me in giving explicit directions. My conviction is that any dose, from the crude drug to the most minute particle of a drug, may prove curative. There is no fixed law regulating dose, and there never will be.

The best criticism I desire for this book and myself is that I have been honest, liberal, and conscientious.

E. M. H.

CHICAGO, March 1, 1894.

No. 65 East Twenty-second street.

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THE

PRACTICE OF MEDICINE.

CHAPTER I.

FEVERS.

EPHEMERAL FEVER.

THIS fever, sometimes called "simple," is a non-specific fever, either remittent or continuous, which runs its course in a few days, and terminates in a rapid convalescence; presenting no characteristic lesion, and seldom any premonitory symptoms, its access being sudden. It may be caused by mental emotions, by extremes of heat and cold, by excessive mental and physical fatigue. It may last a few days, or a few weeks; and it is impossible to predict, in the beginning, whether the fever is simple, or has a specific cause. Not until indications of some local lesion occur, can we make a diagnosis. It is often remittent, the temperature being nearly normal in the morning, and rising to 103° or 105° F. in the evening. If it occurs in a malarial region, and during the months when malaria obtains, it may be confused with miasmatic fever.

Treatment.—If the patient is robust and strong, little or no food is necessary; only plenty of cool pure water, a cool well-ventilated room, and cool or warm sponging. To weakly patients, gruels, broths, fresh milk, or wine-whey, may be given. If there is a suspicion of noxious matter in the digestive tract, it should be removed by an enema, aided by a simple laxative, like seltzer aperient, congress water, or phosphate of soda.

Aconite is sufficient in nearly all cases, particularly if there is anxiety, dry heat, and a small hard pulse; or if the fever is due to fright or mental excitement.

Gelsemium is equally efficacious if the fever occurs from exposure to rapid changes of cold or heat, and especially if the febrile movement tends towards a distinctly remittent type. Other indica-

tions are a flushed, bright-red face, a hot but moist skin, and a quick, but soft, large pulse. Even if decidedly miasmatic in origin, this drug will modify or arrest it.

Veratrum viride is a potent remedy in robust persons, when the temperature reaches 104° or 105° F., and the pulse is large, hard, and bounding.

Bryonia is adapted to those cases which seem bilious or rheumatic, with acute pains all over, worse on movement, with dull, stupefying headache, but with a temperature rarely above 103° F.

Phenacetin, in doses of two or three grains, will relieve the aches and pains sooner than any other remedy.

Eupatorium perfoliatum is an excellent remedy when the fever assumes a decidedly bilious character, such as is commonly called "bilious fever," occurring in the summer and autumn months, remittent in character, with vomiting and purging of acrid green matter, violent aching, apparently "in the bones." If the fever is miasmatic, it acts equally well.

Mercurius and ipecac, for many years a very successful remedy in my practice, has been a combination of the 2x trituration of these two drugs, especially when the tongue is foul, brown, or "pasty," the breath offensive, the bowels confined or loose, and when there is great nausea or vomiting, but only a moderate fever; then a few grains every two hours will soon effect a favorable change. These remedies can be used in alternation, if that method be preferred.

MALARIAL FEVERS.

I.—SIMPLE INTERMITTENT FEVER.

A paroxysmal disease, due to the action of a malarial poison, supposed to be a bacillus, characterized by the occurrence of febrile paroxysms, consisting of a succession of definite stages, namely, the cold, the hot, and the sweating stage, separated by an apyrexia, or intermission of variable length. According to the length of the interval, the fever may be of different types, hence the names: Quotidian, tertian, or quartan, *i. e.*, a fever every day, every second day, or every fourth day. These are typical forms, but there are many atypical forms; I have seen the paroxysms occur twice a day, every three days, every fifth, sixth, and seventh day, and even every

fourteenth day. More singular still are those forms termed "masked ague," when the paroxysms may assume as many forms as the transformations of the fabled Proteus, forms in which there is no chill, fever, or sweat, but instead, periodical attacks of headache, eyeache, earache, neuralgia of any organ, gastralgia, cardiac disorder, diarrhœa, dysentery, swelling of a joint, imitating rheumatism, ovarian pain, hemorrhages from various organs, and even paroxysmal insanity; all these manifestations, and many more, I have seen occur; not only have I seen them occur uncomplicated with other diseases, but I have seen non-malarial disorders change to malarial, and have seen the malarial paroxysms engrafted upon, and mix and mingle with, non-malarial disorders. There is no form of disorder that it may not assume or imitate. Why the malarial should cause this periodicity,—varying in different cases,—or why it should assume so many different forms, has not been satisfactorily answered. Laveran's hypothesis is that the paroxysms coincide with the development of the bacillus malariæ, but he does not explain why the paroxysms occur without fever or chill, or why these manifestations are often located in some particular nerve, or joint, or organ of the body. What, for example, has the bacillus to do with an attack of hematuria, hysteria, or paroxysm of mania? Again, why do these paroxysms persist long after the bacilli are supposed to have left the system? No fact is better known than that malarial fever is not contracted after the occurrence of frost, or after the temperature remains constantly below 50° F.; yet patients that have been the victims of ague, often continue to have paroxysms similar to genuine ague, all through the winter; these attacks are commonly called dumb-ague. My explanation is that the nervous system is naturally prone to paroxysmal manifestations, as in periodic neuralgia not due to malaria, and that the post-malarial paroxysms are kept up by a habit into which certain nerves have fallen. There is a peculiarity of these post-malarial paroxysms that has created an element of great uncertainty in the therapeutics of ague, namely, that the paroxysms can be arrested by suggestion, by mental shock, change of environment, etc. This accounts for the multiplicity of remedies which are supposed to cure or to arrest the paroxysms; many of these are as absurd as are the alleged "cures" for warts. I have known the setting back the hour-hand of the clock prevent the access of the

paroxysm; the belief of the patient that he has passed the hour of his chill is often sufficient to prevent a paroxysm of "ague from habit."

Treatment.—The treatment of Intermittent Fever has been a bone of contention in the homeopathic school, the extremists contending that we should select medicines according to the totality of the symptoms, ignoring altogether the element of periodicity. These physicians claim success, even in pernicious cases; but I cannot believe it, because for several years I tried faithfully, with painful study, to treat ague after that plan. I did not succeed; sometimes the paroxysms ceased on the seventh or fourteenth day, as they will do even if left to nature; often they assumed a remittent character, but oftener my patients took the case into their own hands, and swallowed quinine *ad libitum*, or employed another physician, who prescribed quinine *ad libitum*. Dr. Kippax ("Lectures on Fevers") gives indications for more than fifty remedies; Bœnninghausen, over one hundred; Allen, many more. This is absurd. Of all these, only ten are of any special practical value; the dogma that *any* remedy, the symptoms of which possess those of intermittent (*excepting the periodicity*), will cure ague, is an illusion. I shall not attempt to argue the question; this opinion is the result of experience and observation; if the individual experiences of others are to the contrary, I shall not try to controvert such experience. Kippax says: "Our sheet anchor in the treatment of simple intermittent is quinine." But when he says that it is "for no other reason than that this remedy is so frequently the *similimum* in cases of ague," I cannot agree with him. I admit that it has a few febrile symptoms which appear to be periodical, but the fact that its chief indication *is periodicity*, is a fact from empirical, not pathogenetic, data, and cannot be disputed. This fact, and why it is a fact, was demonstrated by the experiments of Laveran, Crudelli, and Tomasi, who examined the blood of patients suffering from malarious fever, and found that when quinine was taken into the system, it destroyed the bacillus malariæ; this destruction of the bacillus arrested the paroxysms; but it seems that when it does not destroy them all, then the fever may recur every seven or fourteen days. In a late paper Laveran says that the bacilli begin to accumulate again in the blood within four days, and in seven or fourteen days are in sufficient number to cause a relapse. For this reason he advises to begin the use of

quinine four days after a paroxysm, and its continuance until the time of the next one. This plan is not new or original with Laveran, but was adopted many years ago by all observant and practical physicians, though they knew nothing of the bacillus. That they were not always successful in preventing a relapse, was due to the fact that they gave too much quinine, and caused a condition of the nervous system and liver which led to the habit above alluded to,— a habit of periodical paroxysms simulating ague. I quote from Manquat's summary of the indications for quinine ("Merck's Bulletin," March, 1892). In malaria it is efficacious in all types, besides being a preventive. Laveran shows that malarial microbes disappear from the blood after quinine has been taken for a certain time, and that the addition of a minute quantity of a weak solution to malarial blood destroys them. He believes the white blood-corpuscles are not directly influenced, but enabled more easily to subdue and seize upon the micro-organisms rendered torpid or moribund by the drug. If given during or just before the onset of an attack, quinine has no power to check it, while this may be prevented if taken at a sufficient interval beforehand. Baccelli (according to the "British Medical Journal") made intravenous injections of fifteen grains during the onset, but during the first six hours could recognize no modification in form, number, or movement of the microbes.

As the largest part of a given dose of quinine is eliminated during the sixth hour after injection—while according to Laveran it is during the onset that the microbes are present in blood in greatest number—the drug should be given at an interval of about six hours before an attack. Quinine should be taken eight hours before shivering appears in quotidian ague, twelve hours before in tertian, and from eighteen to twenty-four hours beforehand in the quartan variety. To these figures, however, another hour should be added; half an hour on account of the tendency of the onset of successive attacks to be antedated to that extent, and half an hour as allowance for imperfect absorption from impaired gastric action. For the last reason also, and to obviate its reaction, the required quantity should be given in two or three divided doses at half-hour intervals. Two doses, eight to ten hours before the expected onset of shivering, are almost always effectual. If the result be unsatisfactory, an aperient should be given.

Laveran states that no microbes are found in the blood of malarial patients after quinine sulphate has been taken for eight days in doses of nine to twelve grains, but that if after three or four doses it be discontinued the microbes reappear, and a relapse occurs. Upon this is based his scheme of treatment, namely: During the first three days twelve to fifteen grains of quinine hydrochlorate daily. No quinine during the fourth, fifth, sixth, and seventh days. On the eighth, ninth, and tenth days, nine to twelve grains. None from the eleventh to the fourteenth days. On the fifteenth and sixteenth days, nine to twelve grains. None from the seventeenth to the twentieth days. On the twenty-first and twenty-second days, nine to twelve grains.

In very severe cases recourse should be had to hypodermic medication; fifteen grains of a salt of quinine may be injected subcutaneously, and repeated after a short interval; as a rule, twenty to thirty grains are sufficient. The injection should be made into the deep subcutaneous tissue to avoid complications. The following formula may be used:

℞ Quinine sulphate . . . . . gr. xv.
Tartaric acid . . . . . gr. viiss.
Distilled water . . . . . drm. iiss.

Antipyrine greatly enhances the solubility of quinine; fifteen grains of quinine hydrochlorate with seven and one-half grains of antipyrine will dissolve in one-half fluid drachm of water. When with severe depression there is reason to believe no absorption has taken place, the solution may be injected into the trachea through the cricothyroid membrane.

In continued malarial fevers quinine must be given in larger doses. Laveran advises twenty to thirty grains daily, nine grains morning, fourteen grains evening, till the fever disappears. This nearly always happens by the second or third day. If fever persists with four days' treatment, it may be assumed to be non-malarial. When the temperature falls, nine to twelve grains should be given daily for a short time. In malarial cachexia quinine wine (*Laroche*) may be taken with meals, but not fasting or long before food; otherwise gastralgia and dyspepsia ensue.

As a preventive quinine is not effective in smaller doses than two to four grains three times a day. It should be given also in all

malarial complications and incidental affections (for example, neuralgia, hemorrhage, pneumonia).

There are some rules relating to the administration of quinine that are important: (1) It does not act favorably if it is given when the tongue is coated, foul, and dry; nor if the bowels are constipated. In such cases the liver is generally congested, and the elimination of bile not normal. If you desire quinine to act promptly, and not to derange the gastric functions, give some chologogue, followed by a saline laxative. In most cases one or two grains of blue mass (if the patient has not been salivated) acts well. If this is not desirable, give one grain of euonymin, irisin, or one-fourth grain of podophyllin in the evening, and the next morning give a glass of rubinat water, or hunyadi-janos; this will carry off the unhealthy secretions liberated by the drugs recommended. If these bitter waters are objectionable use the citrate of magnesia, or congress water. You may go on day after day giving quinine or other remedies for the fever, but unless the tongue is clean and moist they will not arrest it. Our school have not realized the importance of removing morbid fermenting matters from the bowels in the beginning of malarious fevers.

Ipecac, in certain epidemics of malarial fever, in which the type is sometimes remittent, sometimes intermittent, or when the two are mixed, seems to be all that is required. When it fails — although seemingly indicated by the symptoms,— I think it is because the tincture is used. Ipecac does not give up all its virtues to alcohol. The trituration of the root is better. Many physicians use a trituration of nux vomica and ipecac mixed, the 1x of each, with good results. As in remittent, I like the action of the double remedy — ipecac and mercurius dulc. It also acts well alternated with gelsemium.

Eupatorium perf. resembles ipecac in its gastric symptoms, but is chiefly indicated by the bone pains, so called. These pains are, however, muscular, and resemble those of baptisia and gelsemium. The "soreness" of the whole body, of the eyeballs, head, and chest, call for it. No remedy is in more common use among the people; and it is probably most effectual when used in a primative manner in infusion. I found that when the tincture or dilutions failed, a weak infusion seemed to act promptly.

Cedron, said to be better adapted to the intermittents of the tropics, I have often found useful in the north. It is indicated by the exact regularity of the paroxysms, and violent symptoms, such as headache, neuralgia, and local pains, which attend the attacks. In masked ague it is of great value, and in chronic cases particularly, where quinine has been used.

Gelsemium certainly possesses some anti-periodic quality. It differs greatly from ipecac and eupatorium, in that the paroxysms are not attended by gastric, hepatic, or intestinal derangements. The fever has a quick, soft pulse, a scarlet redness of the face, and a soporose condition. It is particularly indicated in the quotidian fevers of children, and in fevers excited by a chill in hot weather.

Arsenicum has a high reputation in both schools as a remedy for malarial fever, but I never attained with it the success I was led to expect by the encomiums heaped upon it; it never cured for me a single typical case of intermittent fever of any variety, *i. e.*, when the paroxysms were regular, and consisted of the distinct chills, fever, and sweat. This seems to be the experience of others, for Hughes, Kippax, and Morse say the more widely the paroxysms vary from the typical, the better it is indicated. The chill or sweat may be absent, and the apyrexia of uncertain duration. This means that the development of the bacilli is irregular, and that the malarial poison has a special tendency to attack vital organs. I do not doubt the homeopathicity of arsenic to malarial fevers, or rather to the pathological condition of the vital fluids and nervous system caused by malaria. This is the reason why it is not useful in acute typical cases, or when the malaria is engrafted on a cachetic state. But it is the chief remedy in typho-malarial fevers, in chronic cases of intermittents,— that persist after several weeks' duration, when the general health begins to decline,— or in patients who have contracted malaria, have partially recovered after leaving the malarious region, but cannot entirely shake off the disease. During our civil war it was found useful in the malarial disorders of returned soldiers. The impoverished blood, sallow skin, gastric irritations, and tendency to œdema, are the chief indications for it. Good results have been obtained from the 30x, and even 200x, according to apparently trustworthy testimony, but I have not been so fortunate, nor have I succeeded so well with the triturations of arsenious acid,

as with Fowler's solution, which I have prescribed in the following manner: One drop after each meal in chronic cases, or in the malarial cachexia. If the patient is confined to his house, ten drops in half a glass of water, a spoonful every two hours. The 1x and higher dilutions can be made from this preparation and prescribed on discs. In some cases of chronic ague and malarial cachexia, the salts of arsenic act admirably. The arseniate of quinine is a favorite with many practitioners, when both arsenic and quinine seem indicated; dose, two to three grains of the 1x; arseniate of iron 2x when the anæmia is great, the lips and gums bloodless, the feet œdematous, and sometimes a general anasarca. Arsenite of strychnine, 2x when the spinal and sympathetic nervous systems seem greatly depressed in vitality, and when a general paresis, with complete absence of food assimilation is present.

Natrum muriaticum comes next to arsenic in usefulness in chronic irregular intermittents, with a cachectic condition. It is indicated in morning chills (11 to 12 A. M.) followed by violent, hammering, frontal headache. Herpes of the lips appears on the third or fifth day. Salt is an old and common domestic remedy, but the people have a strange way of using it. A saturated solution of common salt in vinegar is prepared; it is taken in doses of one or two teaspoonfuls just before the chill. I have known from observation that it is often curative. In an epidemic of intermittent fever that occurred in 1858, along the south shores of the great lakes, a physician in western New York found that the 1x trituration of nux vomica in salt (instead of sac. lac.), cured nearly every case. In later epidemics it was not so useful. In "dumb ague" and masked intermittents it will cure even in the 30x. This and arsenic are the only two drugs that are effective in that dose, so far as I have observed.

Eucalyptus globulus seems to me to act like quinine on the bacilli in the blood of malarial patients. Probably next to corrosive sublimate it is the most powerful destroyer of bacterial life now known. It is also a powerful disinfectant and antiseptic. The great success that attended its use in the hospitals of Australia, California, and Algeria proves it to be a rival of quinine, with none of its deleterious effects. In the reports that I collected and published in the last edition of "New Remedies," it cured three-fourths of all cases

of quotidian, tertian, or remittent malarial fevers. In those cases that resisted the drug, while the periodic paroxysm remained, it was much milder; the tongue cleaned, the secretions became healthy, and the remaining symptoms were readily removed by small doses of quinine. The excessive colliquative night-sweats during the apyrexia also ceased. The dose usually prescribed is one drachm of the tincture every three or four hours, or three times a day, during the apyrexia and paroxysm. I have tested its value in Michigan, also in Chicago, where malarial fevers do not originate, but are contracted in the suburban regions, and I find that less than five drops of the mother tincture every two hours does not suffice, and larger doses are often required. It is said on high medical authority that when the trees are planted on the malarial lands of Algeria, France, Italy, and Mexico, their influence prevents the fever of those regions. In the United States, except southern California, New Mexico and southern Texas, the eucalyptus will not grow north of 28°; even in Florida it cannot resist the frosts that occur there every winter north of Tampa.

If my readers desire to consult authorities relating to the many remedies recommended, they will find the theoretical indications enumerated in the works of Bœnninghausen, Allen, and Kippax.

Prophylaxis of malaria. Residents and travellers in malarious districts have taken quinine and eucalyptus with apparent benefit. African explorers have all used quinine, and the results were uniformly good. They found that six grains a day were sufficient.

A recent letter from a Scotch mission near Lake Nyasa gives the information that "ten grains of quinine with five drops of eucalyptol, taken every third day during a journey by river, prevented any attack of fever during the journey or since." This is worthy a trial by physicians who practice in malarial regions, and who are exposed to infection.

II.—REMITTENT FEVER.

A continued fever with daily exacerbations due to the presence of the bacillus malariæ in the blood. It is ushered in, generally, by a chill,—followed by frontal headache, nausea, vomiting, a foul tongue, and signs of biliary derangement; there may be catarrhal or bilious diarrhœa or constipation. At first, there is a decided remission in the morning, when the temperature is about normal, but near the seventh day the remissions become less, and a typhoid state

seems to obtain. The average duration is two weeks. It may change on the seventh day to a quotidian intermittent.

The treatment of Remittent Malarial Fever should be pursued on altogether different lines. Quinine should never be used, nor cinchona, unless there comes a distinct intermission, when the temperature is normal; it will aggravate the fever, and precipitate the typhoid state. In the beginning of a remission, gelsemium is generally indicated, and, if indicated, will sometimes terminate the fever in a few days; the bacillus in this fever is not so virulent as in the intermittent or pernicious type. Gelsemium should be given in appreciable doses of the tincture, but not enough to cause pathogenetic symptoms; usually one to three drops every hour or two is sufficient. If there be much or any marked gastric or bilious disturbance, murcurius dulcis and ipecac are my favorite remedies, given in combination, two or three grains of the 1x trituration every hour. A tablet of that dose is an elegant preparation; under the use of it the tongue becomes clean, the bowels move gently, and the remissions glide gradually into intermissions. When this occurs quinine, in one-half or one grain doses every hour, should be given only during the apyrexia. At the access of the fever, return to gelsemium until perspiration appears; sometimes this drug will suffice, for it seems to have a certain antiperiodic power; it will often cure an intermittent neuralgia unaided.

Eupatorium perfoliatum is often specific when there is violent bone-pain, soreness of the body, occipital headache, bilious vomiting and diarrhœa, and fullness and tenderness of the hepatic region; it will cure when the remission is almost an intermission; the most efficient dose is five to ten drops of the tincture, every hour or two.

Bryonia and baptisia are useful during the second week, when the fever is more continuous, and the symptoms are more typhoidal.

There is a tendency in a remittent, ending on the seventh or fourteenth day, to recur in seven or fourteen days after. Here quinine is indicated; two grains three times a day, or the arsenite of quinine, a grain of the 1x three times a day, until the critical day is passed.

III.—PERNICIOUS MALARIAL FEVER.

This is another fever caused by the bacillus malariæ; it is malignant, and characterized by dangerous local complications. Impor-

tant organs are attacked, and their functional life destroyed, or serious pathological changes caused in them. It may be remittent or intermittent, generally the latter. The pernicious symptoms usually appear with the second or third paroxysm. It may assume several forms; the varieties have been named comatose, delirious, choleraic, algid, colliquitive, icteric, and another, which I shall call convulsive; this latter generally occurs in children. This fever most frequently occurs in the tropics and the Gulf States. Dr. Drake says it occurs along the southern shore of Lake Michigan, from Chicago to St. Joseph, also on Lake St. Clair and Lake Erie; in fact, all the south shores of Lakes Huron, Erie, and Ontario. Between 1850 and 1860, the south half of Michigan was infested by this dangerous fever, but I learn that all the country mentioned by Dr. Drake is now practically free from any but the mildest form of malarial fever. In southern Michigan, where it was most prevalent up to 1880, the pernicious form is actually unknown. Its onset may be as mild as any common form of ague, but on the second or third attack, it may suddenly assume a dangerous character. Whenever my patients had cold fingers or toes during the height of the hot stage, I could safely predict that the next paroxysm would be dangerous.

Treatment.—It is a mistake, most prevalent in the Homeopathic school, that the different varieties above named need different treatment; the same remedy is indicated in the comatose as in the choleraic form, because the same cause is at the bottom of the malady. The remedy must be directed against the cause, and not altogether against its symptomatic manifestations. I would advise my readers to study the differential diagnoses of this disease, that they may not treat it as a cholera morbus, an apoplexy, or a meningitis. (See Kippax, Arndt, and Loomis.) There is no time to be lost, if you are called to a patient who has had two paroxysms of ague, the second one having symptoms of collapse, or either of the above varieties. A delay of an hour in the use of the proper remedy may mean life or death. In many cases, the stomach or the rectum will not tolerate the presence of the necessary remedy; here is where the hypodermatic method shows its unequaled value. During my practice in a malarial district, 1850 to 1860, the hypodermic syringe was practically unknown west of New York City; and I

had to rely on the usual methods of administering medicines. I soon found that such a condition of low vitality as obtains in pernicious fever destroyed the power of absorbing medicine, and that stimulation by the stomach or rectum was almost *nil*. I lost several patients under the use of attenuated remedies, and I lost some under the use of moderate doses of quinine. It occurred to me that if I could stimulate the circulation temporarily at the time of giving the drug, it would facilitate absorption. Of course, the time to arrest the dangerous paroxysm is during the apyrexia, and the three hours preceding is the best time. I therefore adopted the following treatment when I had to deal with an impending pernicious paroxysm. Beginning about three hours before the paroxysm, I gave five grains of quinine in hot coffee, with the addition of one to five drops of a one per cent solution of glonoine (nitroglycerine). This was repeated every hour, and generally prevented the paroxysm. I believe I was the first to use glonoine for its stimulating power. Brandy or whisky seemed to have no more effect than water in such cases, especially during the period of collapse. I tried atropine, but it was not satisfactory; the nitrite of soda in three to five grain doses would be better, as its action is more lasting. The administration of quinine, especially the bi-sulphate of quinine, combined with glonoine or nitrite of soda, in the following formula, injected into the arm or thigh:

℞	Quinine bisulphatis	gr. 5
	Glonoine (1 per cent so.)	gtt. 2
	Aqua dist.	drm. ss.

In the dangerous state which obtains during the paroxysm, if we fail to prevent it, or are not called in time, the remedies must be selected in accordance with the symptoms. I do not think quinine should be used during the paroxysm, except as a stimulant; when given before the paroxysm, we expect it to act on the baccilli in the blood, arresting their vitality; when we use it during the paroxysm we use it for its stimulating qualities. Fifteen grains every hour during a paroxysm might cause death, or a dangerous aggravation. Forty to sixty grains have had this effect in health. We should not inject more than two or three grains, and this should be combined with glonoine if the heart's action is very feeble; with atropine, if there is colliquative sweating; with morphine and atropine in

choleraic discharges; with opium or hyoscine, in the delirious or comotose variety; with euonymine in the icteric variety. Quinine should not be used in the convulsive variety, unless combined with veratrum viride, gelsemium, or passiflora, and then only before the paroxysm, which usually occurs during the acme of the fever. When you have been called during a paroxysm, and have brought the patient "out of the depths," you have to prepare to ward off another paroxysm; it is the third that kills. If the patient's tongue is foul, the skin icteric, the bowels constipated, give ten grains of euonymine 1x trituration, or mercurius dulcis 1x, or leptandrin 1x, in the same dose, repeated every two hours until bilious evacuations occur. Quinine does not act well when the patient is in that condition; it will aggravate the biliousness, and when the toxic elements of bile are in the blood, the paroxysms of any kind of ague are more difficult to control. Begin three or four hours before the time of the paroxysm, and use the quinine as directed.

IV.—TYPHO-MALARIAL FEVER.

This I would define, not as a distinct entity, but as a Typhoid mixed with a Malarial Fever. Both can co-exist in the same organism. During the first ten years of my practice in one of the most malarial spots in the West, I had frequent occasion to treat this type of fever. The village had no sewerage, and the privies in town and country were nearly always in close proximity to the wells or springs. Typhoid fevers were common in the late autumn or winter months, not so common in summer; but when they did occur in that season, many cases were complicated with the various forms of intermittent, remittent, and pernicious malarial fevers. The most watchful care is necessary in such cases to prevent a fatal termination any time during the progress of the malady. Often we have to combat the combined toxic influences of both poisons at the same critical period. After several years' disappointing and often sad experience with the ordinary remedies then recommended in our text books, I had to adopt an original treatment of my own. If, at the outset of the malady, both the typhoid and malarial elements were present, I began with gelsemium or eupatorium, if their well-known symptomatic indications were present. Later on, baptisia and eucalyptus would be

indicated. If the tertian type showed itself, arsenic was found to be the best remedy; if the quotidian form appeared, quinine had to be used. During the apyrexia, or almost complete remission in the morning, one or two grains were given every hour till the fever increased, when gelsemium or baptisia was given until the next morning. This treatment generally subdued the malarial element for seven days, when it sometimes returned. Often eucalyptus alone given in ten-drop doses subdued all the febrile symptoms. Had I known of Dr. Yoe's "Chlorine water and quinine mixture," I should have used it. My success with this treatment was much better than was that of my colleagues who adopted the routine "regular" treatment, or those of my own school who trusted to the symptomatic treatment with highly attenuated medicines. To prevent relapses a change of residence for a few months is often necessary.

TYPHUS FEVER.

Definition.— Gould ("Medical Dictionary") defines this "An epidemic, contagious, exanthamatous fever, due to a specific but not isolated germ, characterized by a peculiar petechial eruption, and depression of the vital powers, without lesion." Kippax ("Lectures on Fevers") gives a very complete and interesting history of this disease. It is rarely seen in this country, is always imported, being brought here by immigrants from Ireland, Italy, Russia, and a few other countries. I have never seen a case, and will not venture to advise any treatment based on actual experience.

The treatment cannot differ to any extent from that of typhoid fever. Not having any intestinal lesion or local foci for the dissemination of the unknown germ, or bacillus, there is no need of intestinal antisepsis. The constipation which attends this disease should not be allowed to persist too long. Fœcal matter accumulated in the bowels when the temperature of the body is high will generate ptomaines. Without irritating the bowels, they should be kept free from fœcal matter.

I refer the reader to Arndt's "System of Medicine," and Dr. Kippax's exhaustive chapter in his "Lectures on Fevers."

RELAPSING FEVER.

Definition.— A peculiar contagious fever; epidemic; due to a specific poison; occurring during famine; not a native of this country, but like typhus has its habitat in the same countries. It has occurred occasionally in this country, but only when imported. No epidemic has occurred in the western States, but I have seen a few isolated cases in Chicago, undoubtedly contracted by exposure to newly arrived filthy immigrants.

The same treatment, diet, and hygiene recommended for typhoid will be suitable for this. I again refer the reader to Arndt's "System of Practice" and Kippax's "Lectures on Fevers."

DENGUE FEVER.

Definition.— An acute febrile affection of short duration, which appears as an epidemic in hot climates. It is due to an unknown, external, specific cause (probably a bacillus), and is characterized by two distinct and essentially different febrile paroxysms, separated by a remission. It is attended by decided rheumatic pain, with soreness and stiffness of the muscles, and occasionally by a cutaneous efflorescence like that of scarlet fever. It resembles some of the varieties of grippe, which often occur without any influenzal symptoms. The lymphatic glands, inguinal and axillary, are sometimes inflamed and may even suppurate. Relapses may occur. The *sequelæ* are similar to those of grippe.

Treatment.— Kippax recommends belladonna, bryonia, eupatperf, gelsemium, hyoscyamus, pulsatilla, and rhus ven. Dr. Falligant of Savannah, who has had a large experience in this disease, recommends aconite, bryonia, arsenicum, mercurius, ferrum, secale, and sulphuric acid. I have never treated this fever, but theoretically I would advise, in addition to the above, salicylate of soda, phenacetine, acetanelid, manaca, cimicifuga, and the hot pack. Hughes advises cactus and jaborandi. The regular school recommends belladonna very highly, which is singular, for belladonna is quite homeopathic to the symptoms of the disease. They advise the bromides for children, to combat the tendency to convulsions, and, of course, quinine, although they are not sanguine as to its curative powers.

TYPHOID FEVER.

Definition.— A continued fever due to a specific poison, the bacillus typhosus, found in certain forms of animal matter. When this bacillus is taken into the system in drinking water or milk, or inhaled from an infected atmosphere, a fever is caused which is characterized by a gradual approach, followed by malaise, anorexia, dull headache, epistaxis, and bronchial cough, a dry and red or brown tongue, diarrhœa, with pea soup or ochre-colored discharges, tympanites and abdominal tenderness, especially in the right iliac fossa; rose-colored spots after the seventh day, appearing in successive crops; stupor and delirium, prostration, and slow convalescence. The morbid changes are chiefly in the lower part of the ileum, and consist of a necrotic inflammatory infiltration of the follicular structures and neighboring parts, commonly called Peyer's patches. This fever is also known as nervous fever, enteric fever, infantile remittent fever, gastric fever, etc. The temperature is characteristic; it is usually one degree higher each successive morning; 99° to 103° in the morning and 100° to 104° in evening, till the seventh day. The second week it remains nearly stationary, with slight evening exacerbations. The third week it declines in about the same ratio as it increased the first week. The temperature may not become normal till the twenty-eighth or thirty-fifth day. Cases that run their course with but little or no rise of temperature are called "walking typhoid," because the patient keeps up and sometimes attends to his daily business.

The complications are congestion of the lungs, intestinal hemorrhage, perforation of the bowels, or fatal peritonitis. The *sequelæ* are dropsy, phegmasia dolens, paralysis, dysentery, periostitis, abscesses, and mental hebetude.

Treatment.— It is the physician's duty, not only to treat the patient, but to take measures to prevent the spread of the disease. So soon as he is satisfied that the disease is typhoid, the cause should be sought after and found, if possible. It is necesssary to boil all the water and milk used by the patient, even when the infection cannot be traced to those fluids. The sewerage of the house must be examined and, if defective in the slightest degree, repaired. The dejections of the patient must be thoroughly disinfected before they

are disposed of, by covering them with a five per cent solution of carbolic acid, or a two per cent solution of chloride of zinc, or a one per cent solution of lysol or creolin. In the country, when the disease is prevalent, the disinfected discharges should be emptied into trenches and carefully covered over, and these trenches should be far away from wells or springs. The patient's body-clothes should be thrown into one of the above-named solutions for disinfection, and afterwards boiled. If the well, spring, or hydrant water is believed to be infected, it should not be used for washing cooking-dishes until after it has been boiled. In the management of the fever, we must remember that it is purely asthenic. The vital forces are taxed to the utmost to contend against the poison. Depressing agents must be avoided, therefore, and physical exertion reduced to its lowest limit. The use of antipyretic drugs, or the application of extreme cold, should not be thought of. Hyperpyrexia, once such a bugbear, is not now feared so much as formerly. Many patients have a temperature of 104° to 106° for weeks, yet make good recoveries. The reduction of temperature by means of antipyrin and its analogues has no permanent benefit; on the contrary, such drugs weaken the muscular structure of the heart, an effect to be avoided. They do not destroy the bacilli or their poisonous products, but on the contrary, according to Drs. Roque and Wiel, of Paris, cases of typhoid fever treated with antipyrin and other similar drugs absolutely prevent the elimination of toxines. They also state that in cases treated with cold baths, the elimination of toxines by the kidneys is enormous during the whole course of the disease. Regarding the use of cold water, Dr. Germain See, of Paris, decides that water at a temperature of 90° to 97° F. acts better than water at a low temperature. My personal experience is that sponging and compresses of warm water give more relief, and conduce more to a modification of the fever, than does cold water. I believe that the application of ice or ice-water to the head, or to the bowels in tympanites is a very reprehensible proceeding; it is not the heat that kills the fever patient, but the toxic products of the bacillus.

Ventilation of the sick room should be thorough, and the temperature kept between 60° and 70° F. At the outset of the fever, or before, if we can recognize it, I believe the administration of baptisia will sometimes abort the disease unless the secretions are greatly

infected. If during the prodromic stage the patient's bowels have been confined, they should be unloaded thoroughly, but in the gentlest manner. I prefer to do this with an injection of two quarts of hot water, containing one drachm of boric acid. A mild laxative like magnesia, or syrup of rhubarb, can do no harm, but a strong irritating purge aggravates the disease, and especially the local intestinal lesion. The medicines used in the treatment may be divided into constitutional, antiseptic, and palliative. A constitutional remedy must be one capable of causing symptoms similar in appearance and duration, and local lesions similar to those occurring in this fever. The antiseptic remedies are those which, when taken into the stomach, pass into the intestines, and either destroy the bacilli or render innocuous their toxic products. Palliative remedies are required to remove or ameliorate transient symptoms which arise during the course of the fever. Some of our text-books enumerate fifty or sixty remedies to be used in typhoid fever. This is confusing and absurd. This fever being a self-limited disease, all we can do is to modify its virulence; evanescent symptoms will come and go, whether we use medicines or not. The expectant treatment adopted in the hospitals of London and Paris, shows a much lower death-rate than the drug treatment of the dominant school; under the homeopathic treatment the death-rate is a little better. There are but few constitutional remedies for typhoid fever. Arsenic stands at the head of the list; whatever other remedies are used, this should be given all through the course of the disease unless the attack is a very mild one. Four doses a day, of the 2x dilution of arsenite of soda, or the 2x trituration of arsenic acid, or arsenite of strychinia, will greatly modify the disease.

Baptisia ranks next, especially during the first week, when the temperature is highest, and we find the characteristic aching and soreness of the whole body, the darkly-flushed face, and the fœter of the breath, sweat, and evacuations.

Veratrum viride is rarely needed, for true typhoids do not have the hard, large, quick pulse which calls for it.

Gelsemium has been of value in my hands in some cases when there was an evident miasmatic or catarrhal complication.

Bryonia and rhus toxicodendron, successfully used by Hahnemann in epidemics of typhoid in Germany, are not as well adapted to

typhoids in this country. The rheumatic complications which indicate them are rarely present. Bryonia resembles baptisia more than it does rhus, and is indicated when there are bilious complications. Rhus is to be preferred when the patient lives in a low and damp locality.

Belladonna, hyoscyamus, agaricus, and stramonium are useful when there is unusual cerebral excitement.

The mineral acids cannot be dispensed with. Phosphoric acid when the mental and physical forces are at a low ebb, with hebetude, stupor, and paresis. Nitric acid, when ulceration of the intestines apparently exists, and there is tenderness of the bowels, ulceration of the mouth, and slimy, bloody evacuations. Muriatic acid compares with arsenicum, but is especially useful in the last weeks of the disease, when there is decomposition of the vital fluids, dry dark-colored tongue, coated or not, difficult speech, and continuous, muttering stupor. When this acid is indicated, beef tea is generally adapted to the case, and I find that the acid acts best when added to the beef tea in the proportion of a teaspoonful of the dilute acid to a pint, and a tablespoonful given every hour or two. Sulphuric acid is only useful in black persistent hemorrhages, with ecchymoses or purpura.

Turpentine, eucalyptol, and oleum erigeron, are indispensable in all severe cases; a red, dry, glazed tongue calls for their use. They prevent fermentation and the distressing formation of gases present in tympanites. They are powerful antiseptics, and probably destructive to the bacilli. Turpentine and erigeron are the best remedies for hemorrhages, and all favor the healing processes in the intestinal ulcers. But they must be administered in a proper manner, or they are valueless. When given by the mouth they should be prescribed in an emulsion containing three to five drops in each dose of a teaspoonful, and repeated every two or four hours until the threatening symptoms are better. Sometimes, as in tympanites, the emulsion with yolk of egg should be given in an enema, in double or treble the dose, mixed with hot boiled water or milk, and thrown high up into the colon. In several cases I used the "sanitas oil" with good results; the oils of peppermint and gaultheria, and possibly sassafras, could be used with confidence when the others are not obtainable, and in the same dose.

Nux-vomica (strychnia), ignatia, and arnica, are indicated when the muscular weakness, with or without irritability, is very great, the cerebro-spinal system is profoundly depressed, and the patient lies as if paralyzed, motionless, or with involuntary jactitations. I prefer in such cases the phosphate or nitrate of strychnia, in doses of one-fiftieth to one-hundredth grain. In two cases the one-thirtieth grain every six hours had a potent curative influence when all hope had been abandoned by the attending physician. In many cases tincture of arnica root, in two-drop doses every hour, acted promptly when all the dejections were involuntary, and the patient could not be aroused from his lethargy.

Muriate of hydrastia (white alkaloid) acts similarly to strychnia, and is indicated when a general catarrhal state of the bronchia, fauces, and stomach obtains. My favorite formula is as follows:

℞	Hydrastin mur. alba	gr. ii.
	Dilute muriatic acid	dr. i.
	Distilled water	oz. iv.

Give a teaspoonful every four hours.

Digitalis and strophanthus should not be forgotten when the heart becomes weak and flagging, and when slight movement causes it to beat rapidly, or to intermit. In such cases it is dangerous to allow the patient to turn over quickly, to sit, or to stand.

This tendency to heart failure often extends into convalescence; and when I observe it, I prescribe digitalis or strophanthus (two to four drops of the tincture) every two or four hours. Each acts better when alternated with strychnia. The former acts directly on the heart muscle and inter-cardiac ganglia; strychnia indirectly through the spinal cord. (Cactus is often indicated.)

Mercury and its preparations I rarely use in typhoid, and never in appreciable doses. Merc. dulc. is sometimes useful when, during the first stages, the tongue is flabby and foul, with edges showing the pressure of the teeth, and the discharges are green or black. Merc. corros. does good service when there appears to be inflammation of the peritoneum; it rivals arsenic and nitric acid when there is ulceration of Peyer's patches. Opium will often rouse the patient from the profoundest coma: I have known a few doses of one-half or one-fourth drop of the tincture to have this effect. *Per contra*, I have found that hyoscine, an alkaloid of hyoscyamus, acted much better

than the latter when the insomnia at night was persistent. Hyoscine acts equally well if the patient has noisy delirium, with illusions or hallucinations. One or two doses of the one-two-hundredth of a grain, or even the one-five-hundredth of a grain, acts with magical effect.

Phosphorus is often better than arsenic, when to the arsenical symptoms there is added a congestion or inflammation of the lungs. In the so-called "typhoid pneumonia" it is the sheet anchor; but it may sometimes need the aid of sanguinaria, or tartar emetic, or, better still, the arsenite of antimony.

Zincum, especially the picrate or phosphide, is a great aid to us when the mental hebetude is profound, and the patient seems almost idiotic. This condition often occurs during tedious convalescence, when the patient has not been sufficiently nourished, or when too much alcoholic stimulant has been given. Ferrum muriaticum is very useful in the anæmia during convalescence.

It may be observed with surprise, perhaps, that I have made no mention of cinchona among the remedies. I have omitted it because I do not consider it of any value in small doses, and because in material doses it rarely agrees with the patient. Its alkaloid quinine is rarely indicated, although there are two conditions in which it may be useful,—(1) when during the last week, or during convalescence, the debility assumes the following phase: the patient, when asleep, sweats profusely, especially on the upper half of his body, has ringing in the ears, and is deaf; (2) when the fever occurs in a miasmatic locality, and is of an intermittent character, instead of typical. This condition, with or without the symptoms noted under the first, calls for quinine. I prefer the bisulphate, or muriate, always prescribed in a watery solution, with the addition of a little sulphuric or muriatic acid, as the symptoms may indicate. One or two grains at a dose in each teaspoonful of the solution, given every four hours, is sufficient. The frightful abuse of this drug in typhoid fever, especially by country practitioners, is greatly to be deplored; it complicates, and renders dangerous, cases which, if left alone or treated only with appropriate remedies, would surely recover.

Salicin, the alkaloid of salix alba (willow), has an advantage over quinine in that it is rarely toxic, even in very large doses; it has all the tonic properties of quinine, and is nearly equal to it in antiperiodic powers. A late authority says: "Besides its antifebrile action,

it has a marked effect on the whole nervous system, and when administered in doses of twenty grains every hour for ten or twelve hours consecutively, the blood becomes so saturated with it as to prevent the multiplication of all sorts of germs or microbes." When used in typhoid fever the dose need not exceed two or three grains every two or three hours. When thus administered, I have seen it greatly modify the fever and other toxic symptoms.

Eucalyptus globulus has antiseptic and disinfecting powers not exceeded by any other drug in the vegetable kingdom. Its active principle is eucalyptol. If I were confined to any one remedy in the treatment of typhoid, I would select this. When taken into the alimentary canal, it mixes with and disinfects its contents, destroys or prevents the multiplication of bacilli, and neutralizes their toxic products. It is taken up by the absorbents, and is excreted by the kidneys, skin, and bronchiæ. In Australia, the home of the drug, it has been thoroughly tested in the fever hospitals and in private practice, and is pronounced superior to all other remedies. In typhoid and typhus, the temperature was reduced to 100° F. or 99° F.; the discharges from the bowels lost their fœtor, the cough was benefitted, and the convalescence was more rapid. The death-rate was the lowest ever known in that disease. The dose was thirty to sixty drops, every three hours. I have treated many cases with eucalyptus alone with very satisfactory results, though smaller doses were used — five to ten drops every three or four hours.

Treatment by Antisepsis. — Since the general adoption of the germ theory of disease, physicians have been looking for some safe drug that would act as an intestinal antiseptic without depressing the vitality of the patient, or acting as a local irritant. No agent has yet been discovered that will completely destroy the bacillus and its toxic products, ptomaines, in the intestines without injury to the patient. But if we can artificially destroy the baccillus, we shall lessen the production of ptomaines, and thus curb the virulence of the fever. To a certain extent, I believe this can be accomplished, and I have tested several drugs with results that were not discouraging.

Napthaline, which I first tried in several cases, did not give as good results as eucalyptus. Salol gave better results; the dejections became quite inodorous, and the temperature was modified. These

drugs were given in capsules of three grains every four hours. They do not interfere with the action of baptisia, arsenic, or the mineral acids. Dr. Yeo, of London, praises free chlorine as the best agent for the antiseptic treatment of typhoid fever. It is prepared as follows: Chlorine is generated in a bottle by pouring pure hydrochloric acid (forty drops) upon one-half drachm of chlorate of potassium; after two or three hours a little water is added to make the whole measure ten fluid ounces. In this manner, the author says, "we obtain an almost pure solution of chlorine." According to the severity of the disease, one or two teaspoonfuls are given three or four times a day; most favorable results are claimed. Dr. Yeo adds frequently thirty grains of muriate of quinine to this mixture, but the chlorine had better be given alone.

Hydronaphthol, beta naphthol, and benzo naphthol, have been used by Dr. M. Clark of London. The last drug prevents the development of the typhoid bacillus when used in the proportion of one to ten thousand. It is tolerated perfectly, even in children, in doses of ten to thirty grains repeated several times a day. Dr. Clark claims that the results were: (1) reduction of the average of the fever; (2) less offensive stools; (3) early cleansing of the tongue and less dryness of the mouth; (4) absence of albuminuria; (5) convalescence more rapid, and the strength conserved; (6) less risk of the propagation of the disease; (7) diminished tendency to secondary complications. It would seem from the above that intestinal antisepsis may some day be safely accomplished, and that we may add to our resources in the treatment of typhoid.

The advocates of intestinal antisepsis, however, meet with opposition from high sources. I am inclined to side with Dr. Simon Baruch, editor of the "Dietetic Gazette," who, in that journal's issue for November, 1892, writes as follows:

"The brilliant achievements of modern surgery, based upon the recognition of a bacterial etiology, have borne results in internal medicine which, sooner or later, must bring the true physician to grief. Since antiseptics have led to such remarkable triumphs in the open field of surgery, why should not the same results be achieved in the hidden field of internal diseases, which have also been traced to micro-organisms? This appeared to be a legitimate corollary. And yet it has already proved so fallacious that it is time to call a

halt in the eager pursuit of parasiticides that are supposed to pursue the microbe to its innermost hiding place, and destroy its vitality ere it jeopardizes life and health. A little reflection must demonstrate that the treatment of infectious diseases by antiseptics is one of the will-o'-the-wisps of the present progressive era.

"First: It is not probable that the action of parasiticides, as demonstrated in the test tube, may be relied upon in the remote recesses of the human body. Conditions exist here which must modify or neutralize their effect. The various acid and alkaline fluids, through which the antiparasitic remedy must pass, the osmotic conditions to which it may thus be subjected, its possible entanglement in mucous or purulent fluids,—all these operate more or less antagonistically against the precision which is attainable in the laboratory.

"Second: A large proportion of the organisms to which are attributed baneful results in many diseases, are usually not accessible to the action of parasiticides. In typhoid fever, for instance, a disease in which superficial reasoning would direct their attack to the main lesions in the intestinal tract, a deeper study would develop the fact that ere the disease is diagnosed, these organisms have already passed into the lymphatic glands, the spleen, and even into the small lenticular spots on the skin, which are the chief characteristics of the disease. How naphthaline, or salicylate of soda, or salol, or sulpho-carbonate of zinc, or bismuth, is to enter the blood and pursue these enemies into their very innermost lairs, 'passeth the understanding.'

"Third: Even if this were possible, the experiments of Koch and others have shown conclusively that certain concentrations are required for certain bacteria. No sane man would venture to apply these concentrated solutions of antiseptics to any large surface of the body, lest their local or general effect resulting from absorption produce the most dire consequences. Nor would it be possible to maintain the integrity of the blood in which they are supposed to be dissolved.

"Fourth: Even if this were possible, we are confronted with the fact that it is not the micro-organisms themselves which are to be dreaded, but the ptomaines and toxines, whose effect is so destructive to the animal economy. Since the organisms are already firmly entrenched in the latter, and have already begun their productive

career when the physician's aid is invoked, the attempt to destroy them would be futile.

"Arguing upon these briefly-stated premises, it may be assumed that the internal administration of antiseptics in infectious diseases is not so promising as many enthusiasts would have us believe. This pessimistic view may be met by the clinical demonstration of the value of the antiparasitic treatment in some diseases. Reports are constantly published of favorable results which are ascribed to antiseptics. Among these we may take as an illustration the application of sulpho-carbolate zinc in typhoid fever, which is advocated by capable and intelligent physicians. As it is impossible to formulate definitely the result of any treatment in a self-limited disease, the simple clinical results cannot be accepted unless the rationale of its attainments appeals to our reason. The destructive effect of sulpho-carbolate of zinc upon the bacillus of Eberth has never been demonstrated, even in the laboratory. Were this possible it would surely have been done. As has been well said in a recent able paper on this subject by Dr. J. N. Berry, in the 'New England Medical Monthly':

"'That germicides, as such, have at times curative properties is undisputed. We can understand how carbolic or salicylic acids arrest fermentation, but to be convinced that five-grain doses of salol or sulpho-carbolate of zinc, both feeble germicides and hardly sufficient to sterilize an external ulcer, after running the gauntlet of the digestive fluids, including an acid and an alkaline secretion, and after passing over twelve or more feet of intestine and many square feet of mucous surface, and escaping absorption, will find their way to the lower third of the small intestine, and promptly disinfect the secretions of twenty or more Peyer's patches, demands that truly sublime confidence in the efficacy of drugs which we have not yet been able to acquire.'

"If the disinfection of the intestinal contents be the object of the so-called antiseptic treatment of typhoid fever, even this object must fail of accomplishment by the usual remedies. In a disease like the summer diarrhœa of infants, in which bacteria have been shown to play an important role, and in which they are really more accessible than in any other disease, it must be accomplished by attacking these organisms. But surely no rational therapy would

countenance the pouring of parasiticidal solutions in the gastro-intestinal tract. Recognizing the fact that food containing bacilli is one of the chief etiological factors, its sterilization is resorted to as a prophylactic agent. Should bacteria, however, accumulate in the intestinal canal, they may be attacked by irrigation.

"Inasmuch as the lesions are usually found in the large intestines, this may be done with some show of success. But clinical experience has demonstrated here, as it has so often done elsewhere, that the more simply we treat these conditions, the greater will be the success. Just as boiling water has proven to be the best disinfecting agent for the surgeon's instruments, and boiled water the best disinfecting agent for fresh wounds (Shimmelbusch), so has the pædriatric physician discovered that plain boiled water is the most useful agent for intestinal irrigation, after adapting it to the sensitive mucous membrane by the addition of a little chloride of sodium. Just as in the pursuit of surgical asepsis, the mechanical element of the agent is regarded as more important than the chemical, so does the intelligent physician regard the simple washing of the diseased surfaces in the bowel superior to any germicidal action of chemical agents. The lesson we should endeavor to enforce by the presentation of these facts, is the import of simplification in therapeutics, to which we have referred in previous issues. Since the prevalent fallacious ideas on internal antisepsis may retard the progress of the simplified therapeusis, we direct the reader's careful attention to the study of this important question of the day, in the light of the facts here presented."

As above observed, it is the ptomaines and toxines, rather than the bacilli, that we should aim to rid the intestines of. This we can do by irrigation, just as the vital forces aim to do by causing a diarrhœa to wash the intestines out. The greater the quantity of toxic ptomaines, the more profuse the diarrhœa. While I believe small doses of naptholine, salol, and benzo-napthol may aid in the disinfection of the intestines, boiled water, used freely, is perhaps all-sufficient. I have sometimes added peroxide of hydrogen to the water. It can do no harm, and may be beneficial.

Diet.— The maintainance of intestinal antisepsis, with or without the use of antiseptic medicines, depends largely on the diet. This is really the most important part of the treatment. The food

should be of such a character as to be readily absorbed, and to contribute as little as possible to fermentation. The quality, also, is most important; no more should be given than can be readily assimilated, for otherwise the food collects in the intestines, rapidly undergoes fermentation, noxious gases and solids are produced, and painful tympanites results. To prevent this, the most complete food is milk, diluted one-third or one-fourth with lime water, and shaken violently. The milk must be fresh, three or four hours at most from the cow, or thoroughly boiled if it is old. Malted milk is also an excellent food. Light watery soups made from Mosquera's beef-meal, or Libby's fluid beef are good. I do not advise any other of the proprietary beef preparations on the market. If the soup or beef tea is made at home, only the best lean beef or mutton should be used, and muriatic acid and pepsin should be added to it. Valentine's beef juice can be used if the stomach is very irritable, and in the stages of debility, as it can be given in cold water. Rice or barley should be boiled with the meat when the soup is made. The strong beef teas once in use I long ago discarded, as they keep up the temperature and increase the delirium. Baked flour may be mixed with the milk when boiled; such a milk gruel is often relished better than milk, and agrees better with the stomach. Copious drinking of pure water to the amount of two or three quarts a day, in addition to two quarts of milk, is now a very popular diet. Wine whey has long been popular, and I always prescribe it during the second week. Sherry is generally used, but I prefer Tokay if there is much weakness. In mild cases a pure white Rhine wine will do. In very severe cases brandy or whisky in milk will have to be used. I have seen benefit in cases of great exhaustion from the use of some of the wines of coca. No rule is so important, and more difficult to carry into effect, than a rigid adherence to a liquid diet for several weeks during convalescence. A little fish, a piece of bread, or a few mouthfuls of fruit, have caused a serious or fatal relapse. A change of climate and surroundings often hastens slow convalescence.

SEWER-GAS FEVER.

Definition.— This fever is caused by inhalation of noxious gases from defective sewerage, in cities, in buildings, and even from neglected

privies in the country. Sewer-gas results from the fermentation of putrescent animal and vegetable matter, fœcal matter, and urine. In the process of fermentation marsh-gas, ammonia, hydrogen sulphide, and other gases are freely given off. These gases may carry with them numerous pathogenenic microbes, especially those constituting the contagion of cholera, typhoid fever, scarlatina, erysipelas, diphtheria, and other diseases.

This fever may be caused by the toxic influences of others besides the typhoid germs, which have not been discovered, and which are capable of causing a fever as specific as typhoid. I am convinced from my observations that scarlet fever has been contracted by breathing the gases arising from defective sewers. I believe also that typhoid fever may be contracted in that way, and if other toxic germs are inhaled at the same time the results will be a continued fever of a very mixed character.

Dr. Quain ("Dict. of Medicine"), writing of the causes of typhoid fever, says: "The occurrence of typhoid fever is traceable to the absence of proper sanitary arrangement in individual houses. Not to speak of the cess-pools and leaking drain-pipes allowing the basements to be sodden with sewerage sinks, or water-closets may be imperfectly trapped and sewer-gas diffuse itself through the apartments, or be drawn into the living-rooms by fires, or be forced into the house by pressure in the main drains, where the poison *probably enters the system through the lungs.*" I italicize the above, because the writer overlooks the fact that the bacillus typhosis, or any other, need not necessarily enter the system through the lungs; for when air (sewer-gas) impregnated with typhoid or other germs is breathed, many of these germs are arrested on their way by the surface of the pharynx, and especially is this so if the air be breathed through the mouth. Here they become entangled in the mucus, are swallowed in the saliva or with food, and may thus pass into the intestinal canal. It has been denied that this bacillus can be carried in the air; but recently Dr. Bordas ("Therapeutic Gazette") has undertaken a series of researches which appear to show that the bacillus of typhoid fever should be classed among the aerobic micro-organisms. It remains inactive in dry air, but lives and multiplies in air charged with vapor. Finally, he says there is nothing impossible in the belief that the bacillus is capable of directly penetrating

the air-passages and thus starting the typhoid infection. But, as I have shown, this is not at all necessary.

In my experience, sewer-gas fever is never typical typhoid fever. There is something in this deadly gas that more severely affects the nervous system and causes a virulent contamination of the blood, even when there is no fever. Witness the headaches, the insomnia, neuralgia, mental despondency, melancholia, and even insanity; the eruptions on the skin, boils and carbuncles, the sore throat, ocular and aural symptoms.

Dr. Kippax, in his excellent "Lectures on Fevers," says of typho-malarial fever: "It is a miasmatic disease due to the combined action of a malarial and septic poison." I cannot agree with him; his "septic type" is the real sewer-gas fever. It is almost impossible to imagine a typhoid, septic, and malarial complication,—*i. e.*, all three poisons affecting the same persons at the same time. If he meant that the septic or sewer-gas poison alone was united with the malarial poisons, a better name would be septo-malarial fever. I believe a typical sewer-gas fever can exist without either typhoid or malarial addition. It assumes all degrees of severity, from a "walking" fever, where the temperature rarely goes above normal, to a high daily temperature of 103° F. or 105° F. In the epidemic of this fever which occurred about 1880 in the old Matteson House in this city, and in several other dwellings in the same block, all grades of severity were observed. In many cases the temperature was sub-normal; in the third and fourth week, paralysis, dementia, and other severe nervous *sequelæ*, were common. The cause was found in a sub-basement flooded with sewerage, although the water supply had not been contaminated. The poisonous germs were in the atmosphere of the house.

Treatment.— As soon as the physician is satisfied that the fever is caused by sewer-gas, the patient should be removed from the house, no matter how ill he may be. It is better to run any risk than to allow him to remain in the poisonous atmosphere. Removal into pure air may not arrest the disease, but it will greatly modify it, and allow our remedies better chance for favorable action. The body should be sponged several times a day with chlorine water, thymo-hydrastis diluted one to ten, eucalyptus water, or other disinfectant. The diet should be the same as directed under typhoid fever.

The medicines which I have found most useful are, eucalyptus, baptisia, arseniate of strychnine, agaricus, iodide of arsenic; and in addition I would strongly advise the use of hydrogen peroxyde, which bids fair to assume a very important *rôle* in the treatment of all infectious and contagious fevers, especially those which are caused by septic poisons in the system. It is better adapted to sewer-gas fever than to typhoid fever, although several physicians have reported excellent results from its use in the latter. Enough should be administered to saturate the contents of the intestinal canal. The efficient dose is from one teaspoonful of a fifteen-volume solution every hour, to one ounce every three hours. It should be largely diluted with water, one to ten. It is supposed to be perfectly innocuous; it cannot antagonize any medicine above mentioned.

If the fever is typho-septic, the medicines recommended for typhoid fever will be indicated. The same care should be taken in disposing of the excretions and the clothing of the patient. I am of the opinion that this kind of fever is not only infectious, but may be contagious. Medicines must be given in appreciable quantities in order to act in the presence of this pervading poison. I would advise the use of a decoction of eucalyptus leaves, one drachm to four ounces of water, a teaspoonful every two hours. The tincture of eucalyptus may be given in five-drop doses every two hours, alternated with arseniate of strychnia 2x or 3x, tablets (one-hundredth or one-thousandth grain), according to age, one every four hours all through the course of the fever. Iodide of arsenic is useful if the glandular system seems to be suffering particularly from the poison. Enemata of antiseptic agents, if thrown high enough to reach the lower portion of the small intestines, ought to be of great value, not only for their local but for their general constitutional action.*

The preparations mentioned under typhoid fever would be appro-

* All of the above intestinal antiseptics, from some cause, seem at times to disappoint us; and in this case we may try the bromide and lactate of strontium, lately introduced into therapeutics by Drs. Dujardin-Beaumetz and Germain See, who declare that the "toxic alkaloids, ptomaines, and leucomaines, in the human organism, do not form in the presence of the lactate." They assert that the bromide, when given in ten to thirty grain doses, causes a notable diminution of the gases of the intestines. It prevents the acetic and lactic acid fermentations, and destroys the gases of decomposition. It is safer than napthol, or the sulphite or salicylate of soda, and less irritating; besides, it exerts a calming influence in low fevers, and favors sleep.

priate; also thymol, one to one thousand, using one or two quarts three times daily. Most of the medicines I recommended for typhoid are suitable in septic fever.

One of the most distressing symptoms of this fever, as well as of typhoid, is the persistent dryness of the tongue, which often extends to the whole buccal cavity and pharynx, making deglutition and speech impossible. If neglected, the tongue cracks, bleeds, and ulcerates. A wash of glycerine and lemon juice is grateful, but needs to be constantly applied. In several distressing cases, I have prescribed pilocarpine muriate, one-twentieth of a grain (a hypodermatic tablet of that quantity, dissolved in a teaspoonful of water, or used hypodermatically). The effect was excellent; without causing a copious flow of saliva, it kept the tongue and mouth moist. The relief was very grateful to the patient.

ROCKY MOUNTAIN FEVER.

Definition.— A continued fever occurring in the Rocky Mountain region at high altitudes, or in valleys and at the base of mountain ranges. By some this is considered a malarial fever, but it is doubtful if the bacilli malariæ are found in the mountainous regions. Typho-malarial fever is equally a misnomer. The theory that it is purely a typhoid fever has not been proved by the discovery of the bacillus typhosus. I have no doubt that at the present time the drinking-water of the mountain streams is sometimes contaminated with the typhoid poison, but it could not have been before that region was settled unless it was contracted from ice or snow water. It is now known that freezing does not kill all bacteria. Those who frequently examine ice, and have followed Tyndall, Cramer, Leone, Fraenkel, Engelmann, Prudden, and others in their investigations, know that water is only partially purified in freezing. The freezing process removed for Pengra only from twenty per cent to fifty per cent of the organic matter, forty per cent of the inorganic salts, and about ninety per cent of the micro-organisms. The diminution of bacteria in water in freezing is owing largely to their destruction, instead of expulsion. But some species of bacteria have great power of withstanding cold, and the bacillus of typhoid fever has been found in ice several months after its formation, and there are many other

classes of germs that cannot be destroyed by freezing alone. When such impure ice is melted the living germs regain their activity, and, if pathogenic, are capable of producing disease.

Impure snow-water is also sometimes detrimental to health. Some years ago Dr. Charles Smart, of the United States Army, traced the cause of the mountain fever to the melting snow of the Rocky Mountain streams, and inferred that the germs of this typho-malarial fever were brought down from the atmosphere by snow, remained frozen during winter, and then passed into the streams in an active condition when the snow melted in May, June, and July.

Having seen but few cases myself, in persons who were attacked on the way from the mountains to Chicago, I do not feel competent to decide as to its nature. It seems to me a modified typhoid. For fuller information I wrote to Dr. L. D. Ordway of Denver, asking his opinion as to the nature of the fever and the most appropriate treatment, to which he replied as follows:

"This so-called 'Mountain Fever' in every respect so closely resembles typhoid that it might without much impropriety be termed false typhoid. Quite a number of cases of combined fever have come from other hands to my care (labeled typhoid fever) in which there has been no true iliac lesion or typhoid eruption. In fact, we have very little typhoid fever in the state of Colorado. I have seen and treated a few well-marked cases. Mountain fever may occur in isolated cases at any season, but the time when it is most prevalent is in August, September, and the first of October, this being the time of year when our mountain streams are the lowest, and thus the large quantity of mineral they carry in solution is the least diluted. This form of fever is not contagious, but prevails in these months, becoming thoroughly epidemic in our dry years. By dry years I do not especially refer to the amount of rainfall during the summer months, but to the small amount of snow that fell during the previous winter in the mountains, melting during the summer, and serving as a reservoir to keep up our streams. From these statements you will see that I attribute the cause to inorganic or mineral substances in solution in our drinking-water, instead of organic, as in true tpyhoid fever.

"There is also some resemblance to the Pernicious Malarial Fever of the South, seen in the severe aching of back, limbs, and

head, character of tongue, especially at first, and the remission of the fever. The attack is not quite so insidious as in typhoid. The first symptoms usually noticed are lassitude of mind and body, soon followed by aching, in most cases of the whole body; in all, some aching of the legs, back, and back of head. The fever usually is at first a little higher than in typhoid fever, but not running so high.

"At the commencement the tongue is not so thickly coated as in typhoid; it is yellowish, with red spots (pin-head), indicating congestion of liver and stomach; it has more the general appearance of bilious remittent fever. The remissions of fever are quite marked, of course varying some, usually from 100° F. in the forenoon to 104° to 105° F. in the afternoon in severe cases. Mornings you will often think from touch that there is no fever, but the thermometer soon dispels that idea. If remedies do not soon control the disease the tongue assumes a decided typhoid look; in cases that get very low we have sudamina, but I have never seen the typhoid eruption on abdomen. At the first, along with the general aching, oftentimes the whole abdomen will become painful and sore to the touch, which never settles in the iliac region, and soon passes off the third day, sometimes sooner. About fifty per cent, during or at the close of this soreness of the abdomen, have several freely loose bilious stools, the others being constipated, with a history of having been so from two to ten days. In the cases treated homeopathically from the start, I have seen very little delirium. The kidneys, when not diseased before, are not more affected than in bilious fever, but when the kidneys are already weak or diseased they add serious complications.

"Mountain Fever also differs from typhoid in this, that if taken early it may nearly always be aborted. As to its duration when not checked, it again resembles typhoid, passing through similar stages, and with about the same limitations and terminations. When it has been treated homeopathically from the first, results have been favorable. As with most other diseases, it differs considerably with different years. Three years since (a very dry season) it was much more severe, and with prolonged cases there was frequently hemorrhage from the bowels; but this hemorrhage seemed to me not to be

from any particular spot of ulceration, but an outpouring from the capillaries, as in remittent fever of a low form.

"In the first stage, when lassitude and aching are the leading symptoms, gelsemium and nux, both low, will abort many cases,— some will persist in aching until you will think of trying some other remedy; but don't do so, except possibly in a few cases where the pain and soreness of the bowels predominates; here bryonia and colocynth will control. Gelsemium continued throughout the case is the fever remedy *par excellence;* occasionally, and perhaps the only other fever remedy, veratrum viride. During the continuance of the disease the other remedies indicated are: iodide of arsenic, arsenic album, rhus tox., baptisia, cinchona, and ipecac,—the last two controlling promptly the hemorrhage. There is a remedy indigenous to the Rocky Mountains: Sierra salvia, commonly known as mountain-sage. Among the Indians and old Spanish settlers this has a great reputation for curing mountain fever. Hearing so much of the mountain-sage, I obtained it, made a tincture, and tried it with some success; but finding the drug picture of gelsemium so constantly present, and getting such uniformly good results from it, I soon quit experimenting with the sage."

YELLOW FEVER.

Definition.— A continued fever produced by the introduction into the human system of a specific poison. It consists of a single paroxysm of indefinite duration, but always tending to terminate in two or four days, or a multiple thereof. Its symptoms are: Epigastic tenderness; nausea; projectile vomiting; redness of the eyes; violent frontal headache; pains in the back and calves of the legs; a slow, uncertain, easily compressed pulse; a deep yellow or bronzed skin after the third day; black vomit a few days previous to death; suppression of urine, and albuminuria. It has an average duration of six days. It is contagious.

For a complete description of this fever, its etiology, diagnosis, and treatment, I refer the reader to Dr. Louis A. Falligant's exhaustive article in Arndt's "System of Practice." Dr. Falligant writes from personal experience,— and quotes such excellent author-

ities as Holcombe, Orme, Belden, Stout, and other physicians of our school in the Southern States. I never have treated a case, and therefore can add nothing to their successful method of treatment. Kippax gives the symptomatic indications for all the remedies likely to be useful.

CHAPTER II.

INFECTIOUS ERUPTIVE FEVERS.

THESE fevers are all contagious. They are specially characterized by an eruption. They are all propagated by a distinct morbific agent, reproduced within the body, and are characterized by a definite period of incubation. They run a clearly defined course, and are attended by an eruption which passes through a regular series of changes and then disappears. They rarely attack the same person twice. This description applies to their natural course. They are often quite erratic in their manifestations, and their variations render them more dangerous.

SMALL-POX — (VARIOLA).

Definition.— A highly contagious fever, lasting from two to four weeks. The eruption is pustular, and attacks both the skin and mucous surfaces. It has four distinct stages: (1) An initial stage, with chill, nausea, vomiting, headache, pain in the back, sore throat, active fever, rapid pulse, and sometimes an erythematous rash. (2) An eruptive stage, about the third day, when a reddish, millet-seed, or pin-head eruption appears, and a subsidence of the fever; the eruption becomes dark-red and papular on the fourth day, slightly vesicular on the sixth day, pea-sized and umbilicated on the seventh day. (3) A stage of suppuration on the eighth or ninth day, when the pustules are fully formed; then a secondary fever sets in, with very high temperature, the face swells, the itching is intense, and a loathsome smell emanates from the patient. (4) A stage of dessication, on about the eleventh or twelfth day, when the pustules burst, crusts and scabs form, which on falling off leave pigmented cicatrices or pits.

There are several varieties named: the distinct, confluent, and hemorrhagic. The stage of incubation varies from ten to thirteen

days. For a complete description see "Kippax on Fevers," or Arndt's "System of Practice."

Small-pox patients are rarely treated in private practice. In city and country they are relegated to the pest-house. If vaccination were universal, made with pure vaccine matter, and repeated as often as every five or seven years, it would disappear forever. Yet there are presumably conscientious physicians, particularly in England, who denounce vaccination, and assert that its effects are worse than the small-pox. Admitting that occasionally blood-poisoning does result when the operation is performed with impure implements, and with impure matter, it is inconceivable how sane men can make such a statement, and believe it.

Treatment.— My experience has been limited to a few cases. In the early part of my practice, a gentleman went from the town where I practiced to New Orleans. A few days after he returned he was taken ill with what appeared to be the first stages of malarial fever. On the fourth day the eruption appeared, and on the fifth day I diagnosed small-pox. The town authorities, at my suggestion, built a high fence all around the house, and diverted the road that ran by it to a distance of one-eighth of a mile. It was a week or more before I could procure any vaccine virus that was humanized; bovine virus was not then being used. All the six inmates of the house were vaccinated. On the twelfth day from the exposure to the fever all came down with the incipient symptoms except an old gentleman who had been vaccinated twenty years before. The others had never been vaccinated. They had the fever, and a scanty eruption appeared, which dried up about the time the vaccine pustule was ripe. They were not very sick, and recovered in a few days. This taught me the wonderful efficacy of vaccination. The first patient was very ill, and passed through all the loathsome stages of the disease, leaving him badly scarred, but otherwise in good health. Since that experience I have treated perhaps a dozen cases. This, and the testimony of our school, leads me to believe that the chief remedy in all stages of the disease is tartar emetic. It should be prescribed in doses of one-one-hundredth (2x) of a grain, or its equivalent, in aqueous solution, and administered every two hours. It is the true similimum of the whole disease. Only when the primary, and especially the secondary high temperature is excessive, may gelsemium or

veratrum viride be more useful. If the pain is very intense, cimicifuga or phenacetin may relieve. I never could understand or verify the recommendation for thuya in this disease. Sarracenia was at one time recommended, but experience has not confirmed its value. The complications must be treated according to their pathology and symptoms, if they become severe enough to call for interference. I have found turpentine useful in the hemorrhagic variety.

The sick-room should be large, well ventilated, and darkened moderately, with equal temperature of 65° to 70° F.; it should be heated by a fireplace or grate, and no carpet or upholstered furniture should be in the room. The skin should be bathed with diluted thymo-hydrastis fluid. During the suppurative stage, a one-tenth solution of peroxide of hydrogen should be applied to the skin by means of compresses of cotton or lint; this destroys the malignity of the pus, and prevents pitting, if the pustules are not rubbed or scratched. A powder called "calendula-borine" may be used by dusting the surface thoroughly with it. If the mucous surfaces are much pustulated, administer the peroxide of hydrogen, a teaspoonful in an ounce of water every two hours. The diet should vary with the stages of the fever; cold water and buttermilk may be allowed; ice-cream is very grateful, eaten slowly, and is safe. If stimulants are used, the red wines are to be preferred.

VARIOLOID.

An acute contagious disease, due to the small-pox contagion, occurring only in individuals that have been successfully vaccinated, or who have had variola. It runs through the same stages as small-pox, but is of shorter duration, and may abort at any period. The treatment is the same as for variola.

VARICELLA — (CHICKEN-POX).

This is an acute epidemic contagious disease, occurring generally in children. The eruption consists of oval, isolated, hempseed-sized vesicles, appearing in successive crops. It occurs only once in the same individual. The period of incubation is eight days; it lasts from four to seven days. It is likely to be mistaken for varioloid. I have seen cases that were almost as severe, but the period of invasion of varicella is longer, the fever more intense, the erup-

tion appears later, and shows on the face first, while varioloid shows on the body first. Kippax says that the eruption of chicken-pox is not umbilicated, but my observation is different. Usually a few pustules on the face are umbilicated, and leave pits; very few children escape without some pits on the forehead or cheeks. The treatment, when any is necessary, is the same as for varioloid. There is no need for isolation; it is such a trivial disease that no one should dread it.

SCARLET FEVER.

Definition.—An acute epidemic infectious fever, characterized by a scarlet-red rash on the body and extremities, accompanied by sore throat. It runs its course in seven or ten days, and ends by desquamation, which usually lasts two weeks. The period of incubation varies from two to eight days. Eustace Smith says twenty-four hours in some cases, and that six days is the average. The patient may give the infection during the first days, but the most infectious period is during the time of desquamation, and does not cease until the skin has entirely peeled. Sporadic cases are met with, and there are cases which doubtless arise from filthy surroundings alone. The epidemics vary greatly in severity. Some are so mild as to be called scarletina or scarlet rash, being very mild and transient. Epidemics of scarlet fever are made worse by filthy sewerage. Open cess-pools and sewer-gas in residences aggravate the disease terribly. Scrofulous and ill-cared-for children suffer badly from it. The rash appears as scarlet points not elevated above the surface; these are closely set, and their borders, which are paler than the centre, unite so as to produce a uniform pink ground, dotted over with scarlet points. The color of the rash disappears on pressure with the finger. The eruption may be confluent or not; when not confluent it may be mistaken for measles. In bad cases it may be dusky or purple. There is often a good deal of irritation and some œdema, making the fingers look stiff and clumsy. During the eruptive stage, which lasts about six days, the temperature runs as high as 105° or higher, the pulse being from 120 to 160, hard and vibrating. Vomiting is severe, the thirst intense, the skin hot and dry. When the rash fades, the fever usually declines. During the

eruptive stage, the tongue, which at first is dry and coated, becomes red, and presents the "strawberry" or "cat's tongue," so characteristic of the disease. The throat is red, tumefied, and often ulcerated. In malignant cases all these symptoms are exaggerated. The eruption may not appear at all, but, instead, convulsions; or the rash may appear on one part of the body, or on one extremity, or having appeared for a short time, suddenly disappears, and coma or convulsion sets in. The complications are: (1) œdema of the glottis; (2) abscesses about the throat; (3) diphtheria; (4) endocarditis, which is the most common complication, and is generally ulcerative; (5) pericarditis, not so common, but I have frequently met with it; (6) rheumatism often occurs during the desquamative period, and is sometimes associated with suppurative synovitis (sodium salicylate is regarded as specific for this rheumatism, in small doses, 1 to 2 grains every hour, until improvement sets in); (7) otitis, when it occurs, is more destructive than after measles, and often ends in mastoid abscess; (8) ozena, from caries of the nasal bones; (9) chorea, complicating, or a part of, the rheumatic endocarditis; (10) catarrhal and parenchymatous nephritis, presenting all the characteristics of acute Bright's disease, leading to dropsy; and finally, (11) inflammation of Peyer's patches, as in typhoid.

Treatment.— If there were really a prophylactic treatment that would absolutely prevent the disease, or arrest it in the stage of incubation, it would be a great boon to humanity. Hahnemann's recommendation of belladonna has been partially verified by physicians of both schools. Eustace Smith says: "It has now been proved to be useless"; while Dudgeon and Bayes, of our school, declare that it has protective virtues. But the truth is probably as Hughes states it, namely, that Hahnemann had reference to the scarlet fever of Sydenham, with bright red *smooth* skin, not the discreet, nor the confluent, nor the dusky and mottled eruption. The old school experimentors who gave belladonna did not follow Hahnemann's directions —to give a drop of the third dilution every three days; instead, they gave the mother tincture in quantities enough to cause its physiological effects. My conviction is, that when given in an epidemic of the smooth red scarlatina, even in doses of the 1x dilution, it may act as a prophylactic. I know to a certainty that it will modify all cases of non-malignant scarlet fever if given during the prodromic, or inva-

sion, stage. Eustace Smith ("Diseases of Children") recomm arsenic as a remedy of great value; but with singular inconsis he combines it with sulphurous acid, and then gives all the c to the arsenic. His formula for a child is:

℞ Fowler's Solution q. s., as much as the child will bear, probably . . . . . 1 to 3 drops.
Sulphurous acid . . . . . gtt. xv. to xxx.
In a little syrup of poppy, three times a day.

He quotes an authority who gave it to one hundred children had been exposed to the infection of scarlatina, and in only twc the fever occur, and both cases were very mild. Now, if the ar or sulphurous acid had been used *alone* the testimony woul worth something. I think the arsenic is worth a trial when the vailing type of the epidemic is malignant. Sulphurous acid is worth a trial. The sulpho-carbolate of soda, so highly lauded one of our school several years ago, proved utterly worthless. icylic acid, in one-fifth grain doses, is said to be an efficient pro lactic. If we could find some microbic poison which bears the s relation to scarlet fever that vaccine does to small-pox, its intro tion into the system by inoculation might prevent or modify intensity of the former. It has been suggested that in the "f and-mouth disease" of cattle such a preventive poison has b found. Milk from such diseased cattle, when drunk, causes sy toms very similar to scarlatina; it has therefore been suggested t the lymph of the peculiar vesicles that appear on the feet of ca could be so modified as to be fit for inoculation, but I am not aw that any conclusive experiments have been made.

Isolation must be carried out in every case. The patient is be put into an upper room, or one separate from the living-roon this room must be large and well ventilated, and kept at a tempe ture of 65° to 70° F.; all woolen fabrics on the bed, and all fur ture, should be removed from the room and the carpets taken u sheets should be hung up in the doors and windows, and kept v with some disinfectant, as the eucalyptus water, made from Sand eucalyptol. The skin should be rubbed thoroughly every day wi mild carbolized vaseline, or eucalyptol vaseline, (one drachm to t ounces); inunctions with benzoated lard is very popular with so physicians. The discharges of urine and fœces must be destroye

and all discarded clothing thoroughly disinfected; nurses must not mingle with the family until the desquamative stage has passed. If the physician handles the patient, he must disinfect his hands and his thermometer. I would recommend that a steam atomizer be kept going in the room day and night charged with eucalyptol water. Some very favorable results have followed this plan. This preparation can be prepared by any one, as follows: One drachm of eucalyptol is triturated with two drachms of carbonate of magnesia and one drachm of alcohol; then add one quart of water and filter.

After recovery, or death, the room should be thoroughly disinfected with the fumes of sulphur or chloride of zinc, or sanitas; and all the clothing and bedding subjected to boiling in one of the above liquid disinfectants. Even with all these precautions, a child sleeping in the room may contract the disease years after. Another method mentioned in "Science" should be adopted: "Infective germs or spores float as impalpable dust in the air. Wet gauze, by evaporation, becomes colder than the surrounding air. Dust is attracted from a warm air to a cold body. If the substance is wet, it adheres. By canopies of mosquito netting over the sick-bed, kept wet with bichloride of mercury solution (one to five thousand) containing glycerine, no dust can pass through the meshes in either direction. The cooled threads attract across the narrow space of mesh all dust that reaches there. The glycerine and water fix it; and the corrosive sublimate sterilizes it. Two layers of netting are required, so that the outer one can be removed every day and wrung out in a fresh solution. This isolates the patient perfectly, even from persons occupying the same room."

Mild cases in an ordinary epidemic do not need all these disinfectant measures, and but little medicine. Aconite and belladonna will conduct the malady to a favorable ending. But severe cases tax the skill of the physician to the utmost. The similimum should be carefully selected, and continued as long as it is indicated. Great harm is done by frequently changing the medicine, because it does not seem to remove the symptoms. We should remember that all we can do is to modify the aspects of the case, not arrest it. If the high temperature and external heat call for aconite, gelsemium, or veratrum viride, use them boldly, until an impression is made on the fever. Each one can be alternated with belladonna, hyoscyamus,

stramonium, or ailantus. Chloral hydrate, when taken to excess, causes an eruption on the skin exactly simulating that in scarlet fever. I have had several cases of chloral poisoning in which the stupor, bright red eruption, and general appearance, bore a close resemblance. The high temperature only was wanting to complete the picture.

Singularly, Professor Wilson, of the old school, has written several articles recommending chloral. He says: "The treatment of scarlet fever by the use of chloral has given me better results than any other; it seems to be almost a specific for the disease. From the beginning give chloral in doses of two to five grains, according to the age of the child, and at intervals sufficient to keep the patient constantly in a slightly somnolent condition. Give the chloral in syrup of lactucarium, and it will be taken very readily by the child." If this experience should be verified, it will be a strong proof of the principle of similia. In some cases, when the œdema of the cellular tissue, face, hands, and feet were prominent, I have used apium-virus with the happiest results. It not only modifies the eruption, but acts favorably on the kidneys, so as to prevent nephrites. I prefer the 1x or 2x trituration in water, repeated every few hours. Next in importance I have found arsenicum and rhus tox.; the former when the eruption was dusky, purpuric, or mottled, and a malignant type threatened. Rhus tox., like quinine, may be useful in certain cases if the idiosyncrasy is favorable, as I mentioned under measles.

In the hemorrhagic variety, turpentine is invaluable. The red glazed tongue, the dark eruption, and the passive hemorrhages, especially from the kidneys, fully indicate this potent remedy. When there is fœtor, and acridity of all the secretions, phytolacca, eucalyptus, and iodide of arsenic, will modify the condition. When the throat ulcerates, and the glands swell and threaten to suppurate, use mercurius iodide, or cyanuret, alone or alternated with phytolacca. These are also good remedies for a diphtheritic complication. There is a phase of scarlatinal malignancy, when the blood loses its plasticity and becomes disorganized, in which the ophidian poisons are valuable. Some of the worst cases in my practice were cured with lachesis; and I have seen crotalus and naja remove very threatening symptoms. In cases of non-appearance, or retrocession of the

eruption, if the patient's vitality was not too depressed, I have had good results from pilocarpine. Under its use the eruption will sometimes appear. The treatment of cardiac complications requires close attention and high diagnostic skill. They require the careful use of bryonia, cactus, strophanthus and digitalis. This rheumatism does not require the remedies for ordinary rheumatism, because it depends on a different morbific cause. I have had the best results from eucalyptus, iodide of arsenic, and iodide of lithia. Post scarlatinal dropsy can be treated only through an action of the kidneys by well chosen renal remedies, such as are indicated in Bright's disease. Apis is a splendid remedy when there is parenchymatous nephritis, when only albumin is found in the urine, and there is general anasarca, benzoate of ammonia, when the urine is a dark, mahogany red, has an offensive ammoniacal smell, a smoky appearance, and is very scanty. Benzoate of lithia and benzoic acid are useful in the same condition, but are not so active. Arsenic has never appeared to be of benefit in my experience, in the anasarca following scarlatina or any other dropsy. I have long ceased to use it for that purpose. I think it has been greatly overrated, probably because the œdematous condition caused by arsenic is due to a faulty condition of the blood rather than to a nephritic origin. Cantharis is indicated for a stage of renal disease in advance of that caused by apis, namely, when with the albumin there is found blood and fibrinous casts, and an almost complete suppression of urine. Turpentine is useful in a condition still further advanced, when there is a passive hemorrhage from the kidneys, showing as a black, "sooty" sediment; the urine is very scanty, loaded with albumin and casts, and the heart becomes poisoned by retained toxic material. The oil of hedeoma is a close analogue of turpentine, with very similar symptoms. Apocynum, when it can be borne by the stomach, will rapidly relieve anasarca when the kidneys are not seriously affected. It is better for cardiac than for renal dropsy, and ranks with digitalis and adonis. I have found that the bitartrate of potassa (cream of tartar), if pure, dispels scarlatinal dropsy when other medicines fail. I cured my own son with it, when the dropsy seemed to assume a dangerous character, no urine having been passed for several days. The dose found effective was ten grains every three hours, in sweetened water. After six or eight hours, evacuations occurred from

the kidneys and bowels, which continued until the anasarca disappeared. In many other instances I have used it with as good results.

RUBEOLA — (MEASLES).

Definition.— Measles is an acute epidemic contagious disease, lasting about seven days. It occurs mostly in early life; is generally unattended with danger, but is especially liable to complications and *sequelæ*. The eruption first resembles red spots like flea-bites, that coalesce into crescents. Measles rarely recurs in the same individual, but Eustace Smith ("Diseases of Children") asserts that "of all the eruptive fevers, measles is, next to typhoid, the one most liable to return." The period of incubation lasts from nine to twelve days.

Symptoms.— The complaint begins with signs of a severe cold; the patient sneezes, coughs, his eyes look watery and red, there is fever, headache, the nose may bleed, there is soreness in the chest, and hoarseness. If the fever is high, there may be delirium and convulsions. The skin is generally moist, even when the temperature is 103° F. or higher; the eruption usually appears on the fourth day, when the fever and catarrhal symptoms are aggravated; it is first seen about the chin, temples, and forehead, and spreads downwards on the trunk to the feet. The rash begins to fade in twenty-four to forty-eight hours, leaving the face quite free while it is still visible on the feet. The rash varies in appearance from the simple crescentic form, to nodules of a dark purple hue, hard and scattered, almost resembling variola. The catarrhal inflammation often extends to all the mucous surfaces, the throat, eustachian tube, middle ear, bronchia, stomach, and bowels. At the last, a fine desquamation of the skin occurs, often unnoticed — unlike the shedding of the skin in scarlatina.

There is occasionally an epidemic of so-called "black measles," or ordinary measles may assume that character in delicate children during a mild epidemic. The fever in such cases assumes a typhoid character. The eruption comes out in irregular patches, and is of a dark-red or violet hue, and the skin is thickly spotted with petechiæ. The pulse is small, feeble, and quick; respiration rapid; tongue dry, brown, and quickly furred; temperature high, with

muttering delirium, coma, and convulsions. Such cases generally prove fatal. The complications of measles are convulsions, which sometimes usher in the attack, and may appear several times during the first day, but are seldom dangerous. If they occur during the eruptive stage, they should cause some anxiety. Hemorrhages from the nose, kidneys, and bowels occur in bad cases. Diarrhœa and dysentery often render the disorder dangerous. Laryngitis is frequent, and leads to croupous cough which alarms the parents, or leads to a hoarseness which becomes lasting. Ophthalmia and otitis are very common, and leave permanent irritation of the lids, and deafness. Pneumonia and capillary bronchitis often lead to a fatal issue. Eustace Smith says: "Tuberculosis is an undoubted and fatal consequence of measles."

Treatment.— In all the self-limited eruptive fevers we should not try to interfere with their normal progress. To do so would be to create unnatural conditions. The fever, the catarrhal discharge, and the eruption, the three characteristic processes of measles, are efforts of the vital principle or force to eliminate the poison of the malady. Our aim, then, should be exerted to aid the vital force in its work, and make the patient as comfortable as possible under the circumstances. The room in which the patient lies should have a good ventilation, without draughts, with a uniform temperature of 70° F. The patient must not be kept dirty; the skin should be frequently sponged off with warm water, rendered alkaline by means of borax or soda. There is no danger from bathing if only a portion of the body is exposed at a time. Neither should the patient be made to swelter under thick clothing. It only increases the liability to catch cold. Use woolen covering altogether; cotton quilts, which do not allow bed-ventilation, should be banished from every sick-room. There is a traditional fear of cold drinks in measles; this is unfounded so long as the patient is feverish. Ice-water or very cold water should be withheld, but the water may be cool enough to be agreeable. If the patient be chilly, and the eruption does not appear, or if the surface of the body is cool, then hot beverages should be given. Hot weak tea and hot lemonade are very agreeable and beneficial. In such cases the appearance of the eruption is favored by increasing the temperature of the room to 80°, and in some cases packing the whole body in sheets wrung out of hot mustard-water.

In mild, normal cases no medicine is really needed, but it i
cult to educate the laity to the safety of a purely expectant
ment. Those medicines should be selected whose effects
human body approach most nearly to the manifestation of the
of measles, namely, those which cause catarrhal symptoms
irritation of the skin. In no other way can medicine aid the
of the *vis medicatrix naturæ*.

The medicines that most closely imitate the action of the
coccus of measles are, for mild cases, pulsatilla, euphrasia, kal
and gelsemium; for severe cases, arsenic, iodine, belladonna,
phorus, and bromine. There are some drugs that would be
in measles were their action on the human system always the
I refer to quinine, antipyrin, copaiva, cubebs, and rhus.
drugs all cause catarrhal symptoms, fever, and eruptions on th
similar to measles, but only in a few persons. Those affect
them in that way are so because they have an idosyncrasy for
drugs. To give these drugs to all persons when indicated is i
cal, because probably not ten in every one hundred patients w
affected by them. It is well known that rhus tox., so often
in various cutaneous and rheumatic diseases, is often very d
pointing in its action. For many years I have found that it
most favorably on those who know they are susceptible to its po
ous effects. Many persons know that they are not susceptibl
it, because they can handle and even chew the leaves with impu
To such it is useless to give rhus tox. It simply has no influ
whatever. The same may be said of the other medicines. We
not prescribe them with a certainty of getting curative results u
the patient is susceptible to those peculiar effects that resemble
poison of measles. My plan of treatment has been to presc
aconite, gelsemium, or veratrum viride, in alternation with pulsat
euphrasia, or iodide of arsenic, according to their specific indicat
in the beginning of the attack, and make no change unless they
to ameliorate, or some complication occurs. Aconite is only us
when its peculiar anxiety, restlessness, and wiry pulse is pres
gelsemium, when the patient is indifferent, drowsy, with scarlet
face, puffy and hot, with a soft, large pulse, and a tendency to
vulsions; veratrum viride when, with large, hard, bounding pu
convulsions are imminent. Pulsatilla has a large sway over

catarrhal and aural pains and conjunctival affections, and presents a good picture of measles. The catarrh is bland, and the discharge soon changes from watery to thick yellow mucus.

Euphrasia has eye and nasal symptoms, more decided than pulsatilla. The eyes are redder, the tears scalding; there is an eruption on the skin like the first stages of measles, but the ears are rarely affected. It should be used oftener than it is, for it is superior to pulsatilla in many cases. Our indigenous pulsatilla (*p. nutalliana*) acts better in many cases than the foreign plant.

Iodide of potash, or, better still, the double iodide of mercury and potash, presents a graphic picture of the most aggravated manifestation of the catarrh of measles. Both have violent sneezing, acrid profuse discharges, excoriating the skin when it comes in contact with it. The catarrh extends to the bronchiæ, larynx, and trachea; there is aching, burning, and throbbing in the frontal sinuses, and in the antrum of the malar bone. Iodide of arsenic causes a catarrh that is more irritating and malignant, and one only equalled by that of kali bichromicum. In some cases phosphorus, hepar sulphur, sanguinaria nitrate, spongia, and arum triphyllum will be indicated.

If the ophthalmic and aural complications threaten disorganization, send your patient to a specialist, when convenient. Otherwise, consult Winslow, Norton, and other authorities. For the treatment of other complications and *sequelæ*, I refer to the special mention of those affections. Patients should be watched carefully for several weeks, in order to ward off sequels, especially the tendency to tuberculosis. In the so-called "black measles," the purpuric and hemorrhagic forms, prompt and heroic treatment is required. The patient will need stimulants, of which an egg-nog, or brandy beaten up with egg, or a good dry champagne, are the best. The chief medicines are arsenic, ailantus, turpentine, eucalyptus, and quinine. The indications for arsenic are well known. It is especially called for when there is dirty, offensive diarrhœa. Ailantus has been of value in some cases. The eruption is livid, petechial, with low delirium, great prostration, small weak rapid pulse, fœtid discharge from the nostrils, cracking of the corner of the mouth, a watery, offensive, excoriating diarrhœa.

Terebinth is often indispensable. It has a petechial and pur-

puric eruption, hemorrhages from the kidneys and bowels, dry red glazed tongue, retention of urine, rattling cough with mucus in the bronchi which the patient cannot expectorate. The general state imitates a certain stage in typhoid for which terebinth is almost specific (dose, one to three drops of the 1x every two hours). Phosphorus has many symptoms in common with turpentine, but it has not the peculiar appearance of the tongue. Quinine in large doses has caused petechial eruptions, with hemorrhages, deafness, prostration almost to collapse, in some persons. In some cases I found it of great value. The arsenic of quinine is probably the best preparation in such cases (dose, one grain of the 3x).

Bronchorrhœa is one of the most obstinate of the sequels of measles. It may last for years, and lead to humid asthma, and prepare a good soil for the tubercle bacilli. I had indifferent success until I adopted the following treatment: If the cough was "rattling" and coarse mucous rales could be heard all over the chest, the quantity of mucus caused an asthmatic or "wheezy" breathing, and if the expectoration was yellow or greenish, I gave copaiva balsam, and a marked improvement soon set in. The dose varies with the age. For adults, one or two drops of the pure balsam, every three hours; for children, the 1x to 3x dilution. Porous discs will absorb one drop of the balsam, or dilutions. When the bronchial catarrh was attended with some hectic fever, eryodiction (yerba santa) is equal to copaiva for the same symptoms. I found five drops (1x) to be the curative dose for children, and ten to twenty drops for adults. When the asthmatic respiration was quite marked but the expectoration was glairy transparent or white, grindelia robusta was the remedy. Dose same as yerba santa. Sometimes the expectoration becomes purulent. Then if the tubercle bacilli are found in the sputum, kreosote or myrtol are the specific remedies. I find they act best when given in syrup of balsam Peru; to each ounce of which add 8 drops of the 1x dilution, and order a teaspoonful every three hours. In cases of sudden retrocession, or non-appearance of the eruption, prompt measures are required. Besides hot packs I have found jaborandi, or one-twentieth grain of its alkaloid, pilocarpin, will cause the skin to flush, become hot, and cover with sweat. That is just what we desire in such instances. Under the influence the eruption will soon reappear. When the patient

influence the eruption will soon reappear. When the patient is verging on collapse, with coldness and feeble pulse, I have brought about reaction with glonoine aided by phosphide of zinc. We should not fear to use palliatives in order to conduce to the comfort of our little patients. The cough, particularly, is so persistent and irritating that it prevents sleep, and excoriates the mucous surfaces of the air-passages, that are already in a high state of irritation. When drosera, rumex, and hyoscyamus do not alleviate, use one tablet of Dovers powder 1x every hour; or a teaspoonful of syrup lactucarium every half-hour; or one grain of codiene 2x, until the cough ceases to annoy. I never saw the slightest injury from these palliatives, and I believe it is our humane duty to use them.

EPIDEMIC ROSEOLA.

Definition.—A mild infectious complaint, called sometimes rotheln, or German measles, having a close resemblance to measles, and is probably frequently confounded with it. The two diseases are, however, not the same, for rotheln does not protect against measles, and often occurs soon after a person has had measles. It has been mistaken for scarlatina, and has been called a "hybrid scarlatina." The stage of incubation is said to last a week. A violent back-ache often attends the first day of the disease. There are very few catarrhal symptoms, but the eyes are often red. At first the tonsils may be swollen, and this sore throat may return on the fifth day. This secondary sore throat is characteristic of rotheln. The eruption is composed of dusky-red slightly elevated papules, first appearing on the cheeks and sides of the nose. The wrists and ankles are attacked almost as soon as the face. It then spreads all over the body. The eruption differs from measles in that the spots do not group themselves in crescentic patches; but large patches of confluent redness may appear on the cheeks, wrists, and fore-arms. There is some itching and a fine desquamation. The temperature on the fourth and fifth days may reach 104°, and the voice may be thick, owing to a sticky mucus in the throat. Sometimes the glands of the neck are enlarged and tender, as are the post-cervical, inguinal,

and axillary. Some epidemics are much milder than this description and some much more severe.

Treatment.—The same hygienic measures as for measles. Sometimes belladonna and gelsemium may be required; also mercurius, iodine, ammonium muriaticum, and phytolaccan. Often no medicine is needed.

CHAPTER III.

SPECIFIC INFECTIOUS DISEASES.

DIPHTHERIA.

An acute specific infectious disease, highly contagious, of a low type, of which the chief local manifestation is a deposit of fibrin on the pharyngeal and naso-pharyngeal mucous surfaces, and on those of the upper air-passages. Exceptionally the exudate appears upon the mucous membrane of other regions and upon the skin. Without giving the history and etiology of this disease, which has been so exhaustively treated by Dr. Jacobi, Dr. J. S. Mitchell, and many other authorities, in the libraries of all physicians, I will make a few observations, the result of my own experience. (1) I believe that pseudo-membraneous croup and diphtheria are two essentially different diseases. There is certainly a diphtheritic croup caused by an extension of the membrane downward into the larynx, if it has not attacked the larynx first. It is just as certain that there is a croupous laryngitis, which does not arise from any specific poison, but is an aggravated catarrhal process. I have treated many such cases when there was no diphtheria in the same village or township, and when neither the child nor any person in the house had been exposed. These cases supervened on a common cold that affected all the members of the household, only one of whom had membraneous croup. (2) I do not believe that diphtheria can arise from filth alone, but the presence of filth, especially the gaseous form (as sewer-gas), greatly aggravates all cases subjected to its influence. I am sure, however, that cases of diphtheria do arise from sewer-gas containing the microbes of that disease. In a discussion on diphtheria, published in the "British Medical Journal," Dr. Russell cited several instances in which steam had seemed to be an active factor in the propagation of the disease. Hot water and steam from a brewery were introduced into some old cesspools, and evidently

wakened into activity germs which, if undisturbed, would
mained dormant. An epidemic of diphtheria soon develope
vicinity, and was not checked until the steam was turned in
channels, when it quickly ceased. If, as we now believe, th
lus of diphtheria develops with special rapidity in the pres
warmth and moisture and absence of light, it is not u
able to suppose that the introduction of hot water or ste
cesspools or sewers may be a most dangerous procedure. (
it is contagious as well as infectious, the case cited by
("Arndt's Practice") seems ample proof, as I can substantia
personal observation. (4) My observations convince me t
disease may occur twice or more in the same individual.
my patients had genuine diphtheria several winters, and final
of it. (5) As to the nature of the contagion, the conclus
Wood and Formad appear most reasonable: "The contagio
terial of diphtheria is really of the nature of septic poison, w
locally very irritating to the mucous membrane, so that when b
in contact with that of the nose and mouth it produces an i
inflammation without absorption by a local process. Whilst a
tion is not necessary for the production of the angina, it i
probable that the poison may act locally after absorption, by
carried in the blood to the mucous membrane." The claim
by some pathologists that diphtheria is always a purely local di
before auto-infection from the locality affected, seems to me i
sible. What physician in large practice has not seen violent c
tutional symptoms and death occur without a local lesion any
discoverable? In such cases the septic material absorbed
without poisons the whole system, especially the nerve-centres.
strange unsusceptibility of physicians, and of some children, t
infection of diphtheria under the worst circumstances is yet a
solved problem, as is the whole subject of susceptibility and idi
crasy as much a mystery as ever. (6) The statistics of mort
relating to diphtheria are notoriously fallacious. Hospital rec
are, or should be, trustworthy, but they are not. As for the re
to societies giving the results of private practice, the majorit
them are worthless. What do we think of physicians who re
treating one or two hundred cases with but five or ten deaths? T
were probably nearly all cases of follicular tonsilitis. The t

masses of white or yellow mucus which hangs from the naso-pharynx are often mistaken for diphtheritic membrane, and such cases are frequently reported as diphtheria. It is sometimes very difficult to diagnosticate diphtheria from scarlatina, for in the former we often see a scarlatinal rash, and in the latter the exudation closely resembles some forms of diphtheritic membrane.

Treatment.— I advise the same isolation and antiseptic methods as recommended for scarlet fever. It is essential that the temperature of the room be kept equitable between 75° and 80° F. The food question is a difficult one, on account of the great repugnance of the child to swallow anything. Milk must be given in some form, for it contains all the elements of nutrition. Malted milk, buttermilk or koumiss may be substituted. Meat juices are, in malignant cases, imperatively necessary. Domestic beef tea or broth is best, but Libby's beef juice, given in cold water, is excellent, and some of the peptonized beef preparations are good. Wine-whey made with Tokay is the best stimulant. Some physicians claim unusual success with alcohol or brandy. Dr. R. N. Tooker, who has had a large experience in this disease, is a strong advocate of hyperstimulation in bad cases.

Local Applications.— No one agent gives general satisfaction. One that seems efficacious in one case will fail in others. Alcohol diluted with equal parts of water, or more, or equal parts of aquæ eucalyptol, which I prefer, will in many cases arrest or decrease the exudation, and modify its malignant character. Chlorate of potash has a wide reputation, but has been abused. It has doubtless poisoned many cases, causing disease of the kidneys from which the patients never fully recovered. Jacobi, who is emphatic in his warning against it, says not more than thirty grains should be used (swallowed) during one day. I have discontinued its use except in mild cases. The liquor calcis chlor. advised by Neidhard is effective in mild cases, but is of no value in malignant cases. Permanganate of potash is of great value. It removes the fœtor better than anything else, and is a most powerful germicide. Bromine and iodine never seemed to me to remove it. I have had signal success in several cases from gently brushing the throat, wherever the membrane was present, with a mixture of equal parts of tincture, ferr. chlor. and glycerine. It is very efficacious in preventing the recurrence of the

exudation after it has sloughed off. I think I saved my daughter's life by this means.

Boric acid, while soothing and cleansing to the throat, is not powerful enough to destroy the septic poison, or disinfect the membranes. Eucalyptol is, I believe, one of our best agents to apply to the diseased surfaces. The methods of applying the selected agents are various, but, whichever is adopted, it should not be harsh. The sponge probe is not to be thought of. A soft camel's-hair brush can be used with safety. Gargling, except in adults, can rarely be effectively practiced. In post-nasal cases it is of no value. The spray is gentle enough, but it cannot always be effectively used. Dr. Jacobi strongly recommends injecting through the nose, and in my experience it is the only thorough and rational plan. An Alpha syringe that throws a continuous stream is the best instrument; with this, and a small nozzle or acorn-tip, a gentle douche of the whole post-nasal cavity and pharynx can be thoroughly accomplished. An atomizer throwing a continuous coarse spray is next of value. The antiseptic lotion should not be irritating, for the child will fear it and struggle so that the application can only be made by force and great expenditure of the patient's strength. For this reason, thymol, although a powerful antiseptic, is objectionable; salicylic acid, etc., are equally so. The bichloride of mercury solution (1 to 8,000) has many friends who claim that it is very effectual as a douche, but the quantity used should be small. The cyanide and biniodide could be used, but in less strength (1 to 5,000). When the membrane is sloughing there is probably no remedy so powerful an antiseptic as peroxide of hydrogen. It utterly annihilates the septic principle in pus as soon as it comes in contact with it, and prevents eroded surfaces from inoculation. It can be used in fifteen-volume solution, but if large quantities are to be used it should be diluted with equal parts of distilled water, and injected through the nose. All applications should be made every few hours.

The internal treatment should be based on the law of similia. The proof of this can be deduced from the results of the treatment of both schools, for all the medicines which have been found of any real value internally are capable of causing a similar condition, and nearly all are destructive to Loffler's bacilli. Although many cases begin with high temperature, neither aconite, gelsemium, veratrum

viride, nor any of the chemical antipyretics should be used. In a few cases only have I used veratrum viride, a few doses, with pleasant results. The fever is caused by septic material in the blood, and does not require antipyretics. Nor is belladonna useful except for a brief period before the exudation appears. Eucalyptus in material doses (one drachm to four ounces of water, a teaspoonful every hour) will do much to reduce the temperature safely.

The mercurial preparations are equally praised by both schools, and both claim excellent curative results, with widely different doses. The "regulars" report a great many cases treated successfully with the bichloride in doses of one-tenth to one-sixtieth of a grain, repeated every few hours, until the membrane is detached. They also report great success with the chloride (calomel) in doses of one to five grains every hour till its characteristic purgation appears. They have lately taken up mercurius cyanide, which they administer in doses of one-thirtieth to one-sixtieth grain, "until the membrane is detached." They deny any dangerous or even depressing effects from such doses. What shall we say? In law courts one man's testimony is considered as good as another's unless he can be proved to be untruthful. Now, there are probably as many truthful men in each one hundred of the old school as in the same number in ours. We cannot ignore their testimony, or call it untrustworthy. I see but one explanation of this matter. It must mean that if a medicine is really indicated for a certain diseased condition, it will cure in any dose short of toxic. This conclusion is inevitable, for our school claims just as great success with the same mercurials in doses ranging from the one-hundredth to the thirtieth attenuation. Now, the "regulars" have no more right to deny the testimony of the homeopathic school than we have to deny their own, provided that those who testify know to a certainty that the disease they treated was diphtheria. Although the toxic effects of all the mercurials, particularly the iodides and the cyanides, present good pictures of the ravages of diphtheria, I prefer the cyanide, which I usually prescribe in doses of the hundredth of a grain every hour until I see some favorable change. If such change does not appear in thirty-six or forty-eight hours it should be discontinued. The iodides are best indicated in "strumous" patients when contiguous glands are early affected. Next to the mercurials is kali bichromicum. The chief

diagnostic difference is that under kali the exudate is more tough and fibrous, and there is a tendency to croupous complications. I usually dissolve one grain of the crude drug or 1x, in four or eight ounces of water, according to the age of the patient, and order a teaspoonful every hour or two. Muriatic acid is useful in nearly all cases. When given strong enough to make water pleasantly acid it always affords relief to the patient, and exerts an excellent influence over the mucous surfaces. The "regular" school do certainly get favorable results from the tincture of perchloride of iron, but many of them believe that the benefit is mainly from the acid, and such is my conviction. Phytolacca has always been a favorite remedy, ever since I first recommended it in the first edition of "New Remedies." It is useful in mild forms, when a stiffness and pain attends movements of the tongue or neck, and when the disease begins as a follicular amygdalitis, which, as Jacobi teaches, often forms a soil for the Loffler bacillus. I prefer the 1x in frequently repeated doses. Year after year the newspapers teem with wonderful cures of diphtheria by means of crude sulphur applied to the membrane, but there has never yet appeared any favorable testimony for it from the medical profession. The laity always want to use it, and I always allow them to, but I have never been able to discover any beneficial action. If the heat of the body could evolve sulphurous acid from it we might expect benefit, for it is the acid alone that could be beneficial. This acid has been used with good results, according to several reports in the "Therapeutic Gazette" of 1889 or 1890. Apis mel. is certainly useful if rapid and extensive œdema of the throat and contiguous tissue appears, and I have seen good results from lachesis in some bad cases.

The plan of applying to the membrane some digestive agent has been tried, and some success claimed for it. Trypsin was first suggested, and at that time I tested it in several cases. The membrane disappeared rapidly under its influence, but the patient died from auto-infection. Papayotin, the digestive principle of the papaya of the tropics, has lately come into use, and some good results have been reported. It may digest the exudation and the dead tissue, but it does not destroy the septic poison so as to prevent its absorption. I will suggest that its use be combined with that of the peroxide of hydrogen or eucalyptol. I have tried this method only

in one case, but it was one so fearfully malignant and rapid in its progress that I do not consider it a test.

Next to diphtheritic croup, the complication most to be dreaded is heart-failure. In my early experience with diphtheria, before the importance of guarding against this accident was known, I lost several patients after convalescence was established. They were allowed to sit up and run around the room, when suddenly they would fall to the floor, and were dead before they could be taken up. This experience led me to always caution the attendants not to allow the child to be raised up in bed, or sit up, or to stand upon the feet, until I became satisfied that the heart was strong enough. Heart-failure occurs in diphtheria from various causes. Pericarditis and endocarditis are complications, and may lead to hydro-pericardium or valvular obstruction; or a thrombus may form in the heart, a large clot, which may cause sudden death, or if small, may be preceded by anxiety and dyspnœa. The heart should be examined every day, and if the pulse is feeble or irregular, cactus and nux vomica should be given. My own recent experience with tincture of cactus has taught me that in threatened heart-failure the dose must be larger than we have heretofore used. Recent experience with the tincture, and cactina (the active principle) have shown that heart-failure from paralysis is a secondary effect of the drug, as it is with digitalis and stophanthus. Primarily it causes death by contraction of the heart; give then in feeble and irregular heart one drop of the tincture for each year of the child's age, and repeat it every half-hour, until the danger is past. In pulseless collapse give one-hundredth grain, or drop, of glonoine before giving the cactus; one dose will arouse the almost dead heart, and allow time for the cactus to act. Nux vomica should be alternated with it — one-tenth to one drop every two hours. Cactina is more powerful than the tincture. A grain of the first centessimal trituration is equal to one drop of a good tincture. Digitalis and strophanthus are close analogues of cactus, and can be given in similar doses, but they are not as well borne by the stomach, being bitter and nauseous, while cactus is quite tasteless. Cactina is prepared by Professor Sultan of St. Louis, Mo. It can be used in tincture, or trituration, or can be injected hypodermatically. A condition of vaso-motor spasm of the pulmonary arterioles may set in suddenly, and threaten

life. This condition was first described by Dr. Richardson as "want of blood in the pulmonary circulation." The breathing is labored, although the lungs are full of air, and may be even distended with it sufficiently to produce in younger subjects a peculiar prominence in the anterior part of the chest. There is no sign of imperfect aeration of the blood, but all the symptoms indicate obstruction to the circulatory current. The lips and cheeks are blue, the jugular veins distended, the heart's impulse quick, feeble, and irregular. The body is cold and pale; it may be marbled, especially at the extremities, and there is intense anxiety and constant movement. The heart ceases to act before respiratory movements come to an end. In this condition, if urgent, a drop or two of amyl nitrite should be given by inhalation, or a drop of glonoine (one per cent) be placed on the tongue. This will relax the spasm of the arterioles. Then cactus 1x or digitalis 3x should be alternated with veratrum album, with intercurrent doses of glonoine if the circulation again becomes obstructed. Arseniate of strychnia 3x, a grain every six hours, should be given to prevent heart-failure, all through the disease. It will act as a prophylactic agent against the local paralyses of the pharynx, soft palate, or muscles of accommodation of the eyes. If, however, these paralyses set in, gelsemium 2x will cure the majority of cases. If the limbs are paralyzed, strychnia phosphate 2x, a grain three or four times daily, must be given until they regain their power.

Cures of diphtheritic croup are so rare that it is worth while to put them on record when they do occur.

Master D. S., ten years of age, was attacked on the 19th of November, with sore throat. I saw him in the evening, and found the swollen tonsils covered with a loose, shreddy membrane. It had not the firm appearance of real membrane. Temperature 100°. Pulse 80. Prescribed phytolacca and wash of boric acid. Twenty-four hours after, the throat looked very different. The posterior fauces, uvula, and arch of palate were partially covered with a pearly gray, firm membrane. The nose discharged an acrid secretion, and the nostrils were lined with a thin membraneous exudation. The voice was nasal, and he could not breathe through the nose; no swelling of submaxillary glands. Mercurius cyanide was prescribed as follows: a solution of one-sixtieth grain to one drachm of water, one

teaspoonful every four hours. The throat and nose were ordered sprayed with two per cent solution of Johnson's papoid; and the five per cent solution in glycerine and water, equal parts, to be applied with a brush every half-hour.

Nov. 21. The nose was more pervious, the membrane on the tonsils appeared looser, showing the digestive effect of papoid.

Nov. 22. All day the throat seemed to improve, but in the evening a suspicious croupy cough set in, with hoarseness. Kali bichromicum 1x was given in alternation with mercuric cyanide 2x, and the spray of papoid was used every half hour.

Nov. 23. The symptoms all indicated that the diphtheritic membrane had invaded the larynx. The inspirations and expirations became difficult; the temperature increased to 102°. At 10 P. M. the breathing became so labored that I called in Dr. Pierce to decide on the operation of intubation. It was decided to wait until next morning.

Nov. 24. Dr. A. B. Hale and Dr. Pierce saw him early, and the tube was placed. It gave much relief, and was worn until evening, when it was expelled during a fit of coughing, and with its expulsion came a large semi-tubular membrane, appearing to be partly disintegrated. A long, bent camel's-hair brush, soaked in a fifteen per cent solution of papoid, was pushed into the larynx in the hope of digesting the membrane, and the boy was made to inhale the papoid spray. All day he expelled pieces of loose membrane from the larynx. A tent was made to envelop the upper portion of the body, and into this tent was run a rubber hose, the outer end connected with the spout of a tea-kettle which was filled with lime-water. A constant vapor of this boiling lime-water was thrown into the tent.

Nov. 25. The tonsils, fauces, and palate were free from membrane, the cough was loose and rattling, and the expectoration bloody and muco-purulent. The temperature did not rise over 101°; appetite good.

Nov. 26. Continued improvement; aqua eucalyptol was added to the lime-water. The cyanide of mercury and kali bichromatum were suspended, and sanguinaria nitrate 3x was given every hour.

Nov. 27. Continued improvement. No membrane to be seen

on the vocal cords or in the larynx. The laryngoscope showed only a raw-looking surface.

Nov. 28. From this date the improvement was rapid, but for several days the patient was kept in the tent inhaling the steam of eucalyptol in lime-water. One factor in this case greatly aided us in our treatment: the unusual and intelligent docility of the patient, who allowed us to do as we pleased with his throat. Had he been obstinate, and repulsed the applications, the case would probably have terminated fatally. Milk, beef extract (Libby's), and whisky were given freely. His voice is at times hoarse and whispering, at times clear. If no post-paralysis occurs, this case can be recorded as a marked cure of this most dangerous of all diseases.

The conclusion seems warranted that most cases of diphtheria, when dismissed from treatment, still possess the capability of transmitting the disease. To determine whether this inference was actually realized or not, twenty-one of the twenty-four cases were personally investigated with the view of learning if any, or how many, had been the focus of an epidemic. In only one instance was it found that a case had been the means of communicating the disease to others. While, perhaps, the likelihood of spreading diphtheria after convalescence from the disease is not great, the practical lesson taught by the study here outlined is that the greatest care should be exercised during this period, that the cases be not permitted to mingle too soon with other persons, and that for a long time after the disappearance of the membrane and of all the symptoms of the disease, the patients be instructed to continue the employment of antiseptic gargles.

The question as to how long after the disappearance of the membrane the danger of contagion exists is one at once important and difficult of solution. In this connection, Tobieson (*Centralbl. f. Bakteriologie u. Parasitenkunde*, xii. 17, p. 587) calls attention to the observation of Roux and Yersin that the bacillus of diphtheria may be found in the pharynx of persons that have suffered from the disease as long as five weeks after the disappearance of the membrane. The accuracy of this observation has been confirmed by the investigations of other authorities. To determine in what proportion of cases the presence of the bacilli persists after the disappearance of the membrane, Tobieson made examination in forty-six cases of

diphtheria in which the diagnosis had been established bacterioscopically; and found that in twenty-four the presence of bacilli could be demonstrated in the pharynx at various periods of time after the disappearance of the membrane. It was not found that the intensity of the attack bore any relation to the persistence of the bacilli in the pharynx, or to the lateness of the period at which they were found; neither did the existence of albuminuria exercise any influence in this connection; the existence of laryngeal involvement, and especially of nasal involvement, did, however, exercise a notable influence. In five of the cases, the presence of the bacillus was demonstrated microscopically and by cultivation; in the remaining nineteen, guinea-pigs were inoculated with pure cultures of the organism obtained. Sixteen of the animals died, and presented characteristic manifestations. Two presented local swelling and pain, followed by necrosis; one of these died, but did not present the lesions of diphtheria; the other recovered. One animal presented local manifestations; after six weeks, paralysis of the hind extremities occurred, together with diarrhœa and emaciation.

ERYSIPELAS.

Definition.—"An acute inflammation of the skin, almost always involving the cellular tissue, originating for the most part in the neighborhood of wounds or sores; attended with much redness and infiltration and severe febrile disturbance, and characterized by a marked tendency to spread over the surface and (especially in the presence of wounds) to become contagious. Erysipelas is either traumatic or idiopathic, *i. e.*, it occurs in connection with wounds, or arises apparently spontaneously, on surfaces which were previously sound." I doubt if it is ever really idiopathic, *i. e.*, arising *de nuovo* from within, when there is no lesion of the skin. Some authors say erysipelas of the face is generally idiopathic. I do not think so. Several years ago I had occasion to treat an unusual number of cases. It was during an epidemic of influenza in which the nasal discharges were acrid, and in many cases left a small crack or ulcer just inside the alæ nasi. This crack was generally situated near the tip of the nose, and could be found only by opening the nostril and examining the fossæ. In every case of erysipelas of the face, no mat-

ter where located, I found this lesion. Since that time I have carefully examined the nose in every case of erysipelas of the face — and have always found it. This lesion is the gateway through which enters the streptococcus of this disease. I have known it to originate in an excoriated external meatus of the ear; in a crack of the lips; and in an excoriated canthus of the eye. I do not deny that the coccus may enter the system through the mucous surfaces, as does the bacillus of diphtheria, and it seems to me that the explanations given under diphtheria are applicable here, namely: that the poison of erysipelas may fall upon mucous surfaces, be absorbed into the blood and cause the specific fever peculiar to the disease; or, that it may enter some wound, or lesion of the skin, and cause a local inflammation confined to the region contiguous to the lesion. I therefore reject the division of traumatic and symptomatic. Hebra and Bristowe have the same opinion: that it is not a specific fever, but a local disease. The late Dr. Meiggs asserts in his "Midwifery and Diseases of Women," that puerperal fever is a true erysipelas, like the erysipelas of hospitals. This opinion is not now held by many. Yet it is well known that in hospitals where erysipelas is prevalent, the women in confinement have puerperal fever. This disease was once divided into vesicular and phlegmonous, but now the divisions are: simple, when only the cuticle is affected; phlegmonous, when the subcutaneous connective tissue is involved; œdematous, suppurative, or gangrenous, as the case may be, when it takes on either of those characters. It sometimes attacks serous membranes: thus erysipelas of the trunk may extend to the peritoneum, pleura, pericardium; and to the cerebral meninges. It may extend to mucous surfaces, as into the ear, nose, fauces and vagina; the veins, absorbents, and sympathic glands are often affected. When the infected area is on the skin there may appear, at short distance, isolated inflamed spots of the size of a quarter of a dollar, scattered here and there on the normal skin. These are sensitive to pressure, and are the foci of a new infection.

I will not go into the ætiology, morbid anatomy, etc., of this disease, but proceed to the principles of treatment.

Treatment.— The fever, in case of local infection and inflammation, does not set in until the blood has become poisoned; then it is like any other septic fever. If it is taken into the system, as it

is in epidemic erysipelas, the fever begins before any local inflammation appears. The treatment will, therefore, depend upon the method of manifestation. If the constitutional symptoms appear first, we cannot always predict that they will lead to erysipelas, for the symptoms are such as usher in many diseases, namely: chills, fever, vomiting, headache, pain in limbs, high temperature, and quick, hard pulse. These symptoms would call for one of the fever trio: aconite, gelsemium, or veratrum viride. Veratrum viride seems to have some specific value in intensely inflammatory erysipelas, aside from its influence in reducing the febrile heat. Dr. Wilkinson and Dr. Drummond of England report many cases of extremely violent character which were arrested by its use, internally and topically; thirty drops were added to a half-pint of water, and constantly applied to the inflamed surfaces. At one time I used it locally, but stronger, and on antiseptic cotton or lint. It might be of benefit to add veratrum viride to an ointment of ichthiol. When locally applied to inflamed surfaces veratrum reduces the heat and redness. Dr. A. N. Banarji of India reports curing an erysipelatous inflammation of the calf of the leg with the gtt i. every two hours. As soon as the local inflammation appears, belladonna is called for in alternation with the fever-remedy selected, until the violence of the fever is subdued. Belladonna is almost the only remedy indicated in the red, smooth, phlegmonous variety. If it assumes a distinct vesicular character rhus tox., rhus radicans, or rhus venenata are better indicated. In phlegmonous cases accompanied by œdema, apium virus (apis mel.) should be given alone or with belladonna. Sometimes cantharis, euphorbium, or lachesis may be found useful. I consider it important always to see that the bowels are unloaded, for I believe it is dangerous to allow fœcal matter, saturated as it is in fever with ptomaines, to remain in the body. A few grains of merc. dulc 1x followed by a bottle of congress water, or a few ounces of rubinat, or Hunyadi, is always advisable, except when diarrhœa has occurred. Lemonade, lime juice and water, buttermilk and skimmed milk, are the best beverages. Gruels made of wheatena, granum, sago, or gluten flour are sufficient food unless typhoid prostration calls for egg-nog, wine whey, beef tea, etc.

Local Treatment.—When the inflammation enters through a lesion of the skin, or appears localized from general infection, top-

ical treatment is important. The early dogma of our school, that no local application should be made, has been virtually abandoned. There are two kinds of local treatment: one confined to the inflamed surfaces and its immediate surroundings; the other to the surrounding zone. Both have for their object, not a cooling or soothing influence alone, but destruction of the coccus in the tissues. In the first method many drugs, as nitrate of silver, tincture of iron, and iodine were once used, but have been, or should be, abandoned, because they obstruct the pores of the skin. The application should be one that can be absorbed. Lotions of borax, boric acid, and pure alcohol will answer in mild cases. Alcohol (absolute) has been found to arrest the inflammation. A weak (one per cent) lotion in water or alcohol, of creoline, ichthiol, resorcine, carbolic acid, and the bichloride of mercury, have each been highly praised. So have mild ointments of the same substances. I have had the best success with a one per cent of creoline, or a two to ten per cent of ichthiol-ammonia. In one case where an angry erysipelatous swelling appeared on the cheek of a child two years old, this latter ointment arrested it in three days. I consider ichthiol the best, though it should not be used strong enough to cause an eczema. Aqua eucalyptol is excellent in the œdematous variety. When pustules begin to form, after the surface has vesicated, or if suppuration occurs, borated-calendula lotion, or "calendu-boric" powder should be applied. Gilcrist (Arndt's "System of Medicine") objects to carbolic acid and iodoform, when suppuration has occurred, and says: "Experience has amply proved that calendula possesses these (antiseptic and germicide) properties in an eminent degree." Now, I object to this assertion, for experience has not proved it. As one eminent surgeon, Dr. J. C. McClelland, once stated at a meeting of the American Institute: "Calendula has not antiseptic properties enough to keep itself." An aqueous lotion of it, if allowed to stand in a warm place, will swarm with infusoria in a few hours. If used at all it should be combined with boracic acid, when it becomes the best application to wounds we know of. The other local treatment consists in applying something that will cause compression on the zone around the inflammation in order to limit the migration of cocci into the surrounding tissues. Strips of adhesive plaster will do this. I have applied them to the forehead tightly, and prevented inflam-

mation from spreading into the scalp. Collodion is useful. If the collodion is made with two per cent ichthiol it is more efficacious. Methyl blue has lately been advised as even more effective. When isolated red spots — new foci — appear, the ointment, or collodion, should be made to cover the whole of each spot and an inch beyond, or as far as the tenderness is shown on pressure with the finger. In surgical erysipelas some authorities recommend scarifying the zone only skin deep, then after washing the surface with some antiseptic lotion, applying the ointment to the scarified surface, rubbing it well in.

I have not mentioned many of the medicines recommended for erysipelas in our text books, because I believe the symptoms given are of little value. Comocladia is but little used, yet it is a more virulent poison to the skin than rhus. Ledum is of some value when the bites of insects cause an erysipelatous swelling; also arnica. I have cured a few malignant cases with lachesis. Pulsatilla is of little value. Terebinth is useful when large bloody bullæ appear. Graphites and ptelea are of real value in chronic erysipelas, when the slightest irritation of the skin makes one liable to an attack. We get this curative action by an influence they possess to alter the constitution of the blood.

LA GRIPPE — (EPIDEMIC INFLUENZA).

Definition.—Dr. Julius Althans of London, whose opinion seems to me the nearest correct, asserts that this disease is "not a catarrh but an infectious neurotic fever." He refers all the symptoms to "irritant poisoning by a grippal toxine on different centres of nervous force in the medulla oblongata." He attributes the peculiar fever to congestion of the thermolytic (heat) centre in the bulb, by the irritant effect upon it of this "grippal toxine." The other symptoms of the nervous form of grippe were similarly referable to various centres in the bulb. Grippal catarrh with pneumonia is due to congestion and inflammation of the nuclei of the fifth pair and the vagi accessorii in the bulb. The hemorrhagic tendency is caused by a congestion of the vaso-constrictor centre in the bulb, and is occasionally transmitted to the splanchnic nerve by anastomoses in the cardiac plexus, and might then cause symptoms of dysentery or

choleraic diarrhœas. Dr. Pfeiffer of Vienna, and others, claim to have discovered the bacillus of the grippe. The one chief characteristic is that "it is the smallest bacillus yet discovered." Pfeiffer has inoculated animals with the cultures, which caused in them all the prominent symptoms of the disease.

The infection is supposed by some to arise from the secretions of the nasal passages, but this can hardly be, for many cases have no discharge whatever. The grippe bacillus must enter the blood as does the bacillus of malaria. In fact these two bacilli have many effects in common. Both are protean in their manifestations; hardly an organ or tissue escapes their ravages; they poison the brain, spinal cord, and the whole nervous system; the whole extent of the mucous surfaces; the lungs, liver, heart, uterus, ovaries, muscles and glands; and Dr. Savage ascribes to them many forms of mental alienation. Like the cholera, the grippe had its origin in Central Asia; some say in Afganistan. Thence it spread to Persia, Russia, and other continental countries, then to England, and finally to the two Americas. The symptoms are so multitudinous that I will not attempt to enumerate them. We have all witnessed them during three winters, 1889, 1890, and 1891, and shall probably see them for several years yet, for the disease has now come to stay. There is no special or unvarying treatment. We know of no specific, and so we cannot destroy the pervading bacillus by any known drug; we can only treat its various manifestations. I can give but the principal remedies that have been found most useful in the practice of both schools, and add thereto my personal experience and observation. Among these drugs are gelsemium, iodide of arsenic, napthaline, camphor, belladonna, hyoscyamus, phenacetine, salicylate of soda, salicine, nux vomica and strychnia, manaca, eupatorium perf., rhus, and zinc. Gelsemium has probably been oftener and more successfully used by homeopathists than any other drug, in the usual or commoner forms, when the catarrhal and influenzal symptoms were prominent. I will quote an old school authority, and while he doubtless gained his information from our works, his testimony is valuable. Dr. John Aulde declares it superior to all other remedies. He says: "Gelsemium arrests profuse nasal secretions, quiets headache and neuralgia, subdues cough and pain, favors the re-establishment of the secretions through its influence on the skin, kidneys, and gastro-intestinal

tract. It reduces temperature and pulse rate, promotes sleep, and creates a feeling of comfort and well-being without in any way approaching narcosis, or destroying the oxygen-carrying capacity of the blood corpuscles, . . . and the recovery is prompt, perfect, and satisfactory in every particular." He advises ten drops put in three ounces of water, a teaspoonful of this every ten or fifteen minutes for an hour, then at less frequent intervals. I will add that it removes the intense aching and soreness all over the body, and in children prevents all spasmodic symptoms.

Eupatorium perf. is excellent for similar symptoms, when there is added to them acute bilious derangement. Iodide of arsenic is specific when the catarrhal symptoms are intense, when the nose, eyes, and throat are most affected, and the discharges are very acrid and irritating; phosphorus, when the bronchi and lungs suffer most; nitrate of sanguinarina, when the trachea and larynx are affected; napthaline, when the symptoms simulate hay fever, and the discharges are profuse and unirritating. Merc. iod. and kali iod. often do good service, when ars. iod. does not control the intense coryza and other influenzal symptoms; camphor, when the virulence of the poison causes a collapse of the vital forces, with or without choleraic symptoms. Phenacetine is invaluable when pain, general or local, is the symptom most complained of. It is almost indispensable, and there are but few manifestations of pain that it will not alleviate. In children doses of a fraction of a grain will suffice. In adults it may require three, five, or ten grains every hour or two to give relief. In such cases it is not dangerous. I have never seen unpleasant effects.

La grippe often simulates rheumatism very closely. Then the salicylate of soda in doses of three grains every hour relieves quickly. Salicine comes next in order, and is highly praised by some who claim that by "saturating the system" with it, giving ten to fifteen grains every hour, salicine destroys the bacilli of grippe, as does quinine those of malaria. In the few cases in which I used it, it acted favorably. Manaca is indicated when the chief suffering is in the head and joints, which "feel as if bound tightly by an iron band." A teaspoonful added to a glass of water, a spoonful every half-hour, is the proper dose. Rhus tox. is the remedy in many cases when given for its well-known indications. Nux and strychnia are useful

in the paralyses which sometimes follow. Aurum, especially the bromide, relieves many of the mental disorders, particularly despondency, melancholia, suicidal mania, and in children, epileptiform attacks; anacardium, for the mental hebitude, which is often a sequel. In a few cases, when the local pain in the stomach, bowels, ovaries and uterus was unbearable and obstinate, I have injected a combination of morphia and atropine (one-eighth grain of morphia and one-hundredth of atropia) as a temporary relief. It is sometimes necessary to use it.

During the winter of 1892 there seemed to be, judging from the reports of the Chicago Board of Health, an unusual number of cases of typhoid fever. From my own experience I did not believe that the reports were correct. In a communication to a morning paper I explained that a large proportion of the cases reported were grippe fever. I said: "Typhoid fever is always due to a specific bacillus found in drinking-water. The patient is infected by drinking impure water in which this bacillus is found. As there are no wells in this city, it must be in the lake water contaminated by sewage or surface water. Grippe fever is a neurotic form of the grippe, and if it is a bacillus it must contaminate the public through the medium of the atmosphere, as in case of measles and scarlet fever. Typhoid fever is due to the presence of a poisonous bacillus in the intestines, where it causes a specific ulceration of Peyer's glands. The blood finally becomes infected. The fever itself, or the abnormal heat of the body, is due to a septic material in the circulation. The heat in grippe fever is due to a specific poison, affecting the heat-producing centres in the medulla. Typhoid fever comes on gradually with prostration, generally diarrhœa, with little or no pain except a dull pain in the head. Grippe fever attacks the patient suddenly with violent pain all over, at least for a few days. There is rarely a diarrhœa and no intestinal lesion. The duration of both fevers is about the same, fourteen or twenty-eight days. In typhoid fever the pulse is always in accord with the febrile heat, *i. e.*, if the heat is 105° F., the pulse is 120 or 130 per minute. The pulse in grippe fever is usually below the rate which we expect the pulse to be at that temperature. I have often seen the pulse 80 or 90 when the temperature was 104° or 105°. The pulse has this peculiarity in brain fevers and cerebro-spinal fevers, and in no other except the

grippe. I suspect there is a family relationship between grippe fever, meningitis, and cerebro-spinal fever. I am informed that in Indianapolis this winter the grippe has assumed the form of cerebro-spinal meningitis, many cases of which were fatal. A few such cases have occurred in this city. I found that this form was best treated with belladonna and zincum. Among the *sequelæ* of grippe none are more obstinate than the profound nueræsthenia, with great physical prostration. This is best treated by hydrastia mur. (white alkaloid) combined with hypophosphite of soda. The obstinate vertigo is relieved by ergot (ten to thirty drops three times a day; or zinc phosphide tablets of the 2x four times a day).

For the aphonia, especially of singers and public speakers, give causticum, or use the mild faradic current. Impotence in both sexes is removed by sabal serrulata, aurum mur. et sodii, and the faradic current.

La grippe sometimes leaves the patient with a sub-normal temperature which may last several weeks. I had several cases in which it ranged from 96° to 98°, rarely reaching normal; yet the patients did not feel ill. Cocculus and zinc phosphide cured. In many other cases one of the *sequelæ* was a slow pulse. In one case under my care it remained several weeks at 42. Another had a pulse of 40 lying, 50 sitting. My own pulse for a week was 56. In all cases it was regular. Cactus 1x, ten drops every four hours, restored the heart to the normal rate. Some required strychnia, and one sanguinaria.

A physician at the head of one of the largest hospitals in Chicago reports that this disease seemed to increase the severity of all our epidemic maladies. He observed, following the epidemic, many cases of continued fever which had been admitted to hospital classified as typhoid. He soon began to doubt the diagnosis. A study of fifty cases had afforded the following data: No common cause could be assigned. Previous history was negative. Some had had grippe, but the majority not. The prodroma lasted four days, with extreme muscular soreness. The onset was gradual, no chill being noticed, but the fever was continuous without intermission. The average duration was twenty-three days. Relapses were common, but could be attributed in many cases to dietetic errors. There were no head symptoms or coma, and no subsultus. In four cases there was pro-

fuse sweating, lasting over ten days. The stomach was not troublesome. Secretions were all diminished, and there were not cutical discharges. The mouth was rarely dry, tongue not fissured, and no sordes. The dorsum was milk-white. There were no tympanitis or abdominal tenderness; no peritonitis, while the bowels were bound up. In only three cases did the stools suggest typhoid. No bacteria were found in the stools. The urine did not respond to the Ehrlich test, nor were any albumin, sugar, or casts found. There was no rash. He did not believe that the disease was typhoid. In treating the cases main reliance was placed on sponging and packs. Three cases died, one from pneumonia and two from exhaustion. No intestinal lesions were found at any of the autopsies.

WHOOPING COUGH.

Definition.— An infectious specific disease, chiefly of childhood, in which catarrh of the air passages is combined with nervous symptoms. It is divided into three stages, not very sharply separated from each other: the catarrhal stage, lasting from ten to twenty days; the spasmodic stage, sometimes lasting thirty to forty days; and the stage of remission, or decline, which may last three weeks or three months. The complications are bronchitis, pneumonia, emphysema, collapse of lung tissue, convulsions, hydrocephalus, apoplexy, laryngismus stridulus, hemorrhage, marasmus, strabismus, and remittent fever. The stage of incubation varies from five to ten days. Sporadic cases in isolated regions often occur. The exact nature of the contagious principle is not yet placed beyond a doubt. Letzerich supposed it to be fungus; Bouges believed it to be a micrococcus. Dr. Afanasief has lately succeeded in cultivating what he believes is the bacillus of whooping cough. Injected into animals, it developed symptoms closely simulating this disease — even the post mortem appearance was the same. Although generally confined to children, I once treated two cases in old women aged respectively seventy and eighty. It must have been more fatal formerly, for, according to Hirsch, "72,000 persons perished from this disease in England and Wales, between 1848 and 1855, or 1 in every 40 who died." Even now the rate of mortality is too high.

If a bacillus is really the cause, an inoculation of the proper culture ought to prevent or modify the disease.

Treatment.— As it now stands, the treatment for this disease is the opprobrium of all medical schools. It is not an exaggeration to say that hundreds of drugs have been used for it, and not one can be said to be specific. One may seem to be curative in one epidemic, while it will fail in others. Drosera, so highly praised by Hahnemann, especially in the convulsive stage, and in the thirtieth, has disappointed me in any attenuation. Eclectics lately claim good success with it in doses of five drops of the tincture every three hours. It is an excellent remedy for a night cough, worse on lying down, and of a shaking character, but I have never known it to "cut short" the convulsive stage. Neither have I seen such magical effects as Teste claimed for corallium rubrum, in either the 30th or 3x, although I have been assured by mothers that wearing coral beads will modify the severity of the paroxysms. I am sorry to record this experience, but I am not writing this book to repeat parrot-like the recommendations of others. I wish to record actual results. In the first or catarrhal stage, especially if attended by a remittent fever, gelsemium has acted satisfactorily. It shortens this stage, and modifies the convulsive. Belladonna certainly is of benefit in some epidemics. When the convulsive stage begins, the throat is red and dry, the congestion of the head is notable, and causes the eyes to be blood-shot and the pupils to dilate. There is no expectoration, and the cough is worse nights. The old school a few years ago considered belladonna almost specific; they gave it to the verge of toxicity; then they praised atropine for a time; but rarely is either mentioned now. I have to record that I have had more satisfactory results from ipecac and hyoscyamus, alternated or combined, than with any of our remedies. A drop of the tincture of each gives the best results, repeated every two hours. However, if this does not modify the cough in a week, it should be suspended. One of the best palliatives for the harassing day or night cough, which precedes, attends, or follows the convulsive stage, is Aubergier's syrup of lactucarium (lettuce). A chemist recently asserts that this plant contains hyoscyamine. On referring to the pathogeneses of lactuca virosa, you will find that the symptoms closely resemble drosera and hyoscyamus. A good tincture of the fresh

plant acts well in doses of five or ten drops. The virtues reside in the milky juice. The dose of the syrup is a teaspoonful every two hours. I have seen good effects from cuprum when convulsions threaten and the fingers and feet contract forcibly, with stiffness of the whole body, and suffocative attacks caused by spasms of the chest.

These are the chief remedies of our school which I have found of value. I do not ignore the fact that drosera and corallium may have been useful, but the genius of epidemics change; and these drugs may again be useful in future epidemics. About the time Dr. McGruder recorded his experience with Gold (quoted by Dr. Wood, from "Journal of Obstetrics"), I had several cases in which the "whoop" ended in laryngismus stridulus. I found the exact similimum in the pathogenesis of aurum, and gave it in the 3x with good results. In another epidemic I have lately had excellent results with the bromide of gold in the 3x, giving two grains three times daily. I believe this preparation will be found the best. In obstinate cases I have not hesitated to try other drugs. The oxalate of cerium, has been of value when the spasmodic cough so irritated the stomach that all the food taken was vomited. It certainly arrested the symptoms when given in doses of one to five grains several times a day. In a few cases when the paroxysm came only at certain hours of the day or night, quinine seemed to effect a favorable change. Dr. Griffith's favorable experience with antipyrin is worthy of attention. Sonnenberger had the same favorable results. Both report that in several severe epidemics they began its use in the catarrhal stage and continued it into the spasmodic, giving from one-seventh grain in young children to five or ten grains in older children or adults, three times a day. The paroxysms were reduced to five or six a day, and the disease was entirely cured in three to five weeks. Other observers have lately confirmed this experience. In a few cases I used the 2x trit. in five-grain doses with good results. It must be borne in mind that in certain persons small doses of antipyrin cause unpleasant symptoms, and it should be used with caution. Sonnenberger, however, did not observe any bad effects in any case. Other authorities report similar good results with acetanelide, used, however, in smaller doses, varying from one-tenth to three grains every six hours. I have not used it, but I have used phe-

nacetine with favorable results, not only modifying the neurotic element of the cough, but acting as a general sedative. It is much safer than either antypyrin or acetanelide. It controls the nervous erethism that often precedes convulsion, prevents irritation of the brain, and causes the child to sleep naturally. The dose is from two to ten grains of the 1x for young children and three to five grains of the crude drug to adults, repeated every three or four hours. Terpene has been used by Talamon ("Mèdicine Moderne," 1890), with gratifying results. "Children can take five grains three or four times a day. It diminishes the violence and duration of the paroxysms, and hastens the cure of the concomitant bronchitis. It acts as a calmer of the nervous system, modifies and removes the bronchial secretions. It has also antiseptic properties which enable it to act, not only on the symptoms, but on the whole cause of the cough." I have found it to act best when the bronchial secretions were very profuse and clogging, but smaller doses should be used. A few grains of the 1x trit., or one grain in syrup every three or four hours, is sufficient. Acting on the theory that it is a bacillus which causes the cough, vapors, sprays, and powders containing antiseptic agents have been used with varying results.

Bromoform has been sucessfully used. It lessens the violence of the paroxysms, and shortens the duration of the disease. It has anæsthetic powers like chloroform, from which it differs only in that the three atoms of chlorine are replaced by three of bromine. The dose is one or two drops for each year of the child's age, repeated every two or four hours. It is best administered in syrup and glycerine, the dose diluted with a teaspoonful. During the treatment there is a marked absence of bronchial irritation. Some of the most violent cases complicated with pneumonia are quickly benefitted by it. One of the most remarkable claims is that made by Dr. Mohn (in "Maladies de l'Infance" May, 1888). He states that he has in a number of cases produced immediate and permanent cures of whooping cough by fumigations with sulphur. He proceeds as follows: "In the morning the children are clothed and removed from their sleeping rooms in which are hung all the clothing, toys, and everything the children use. In this room about four ounces of sulphur for every cubic yard of space is ignited, and the sulphurous acid allowed to remain in the room about five hours. The room is then

well aired, and the next evening the child sleeps in the room and bed, which is completely disinfected." It is said that a cure is at once produced. Others recommend burning small quantities of sulphur on live coals in the room while the children remain there. The fumes should be strong enough to irritate but little the throat and nasal passages. The vapor of cresoline has been quite popular. Turpentine embrocations to the chest, a spray of two per cent solution of resorcine, and, latest of all, a draught of an infusion of thyme, are highly recommended. All these may be useful in some cases. Even change of air, if only to a few miles in the country, often cures the cough. Various methods have been recommended to arrest the paroxysm itself. Drs. Simpson and Churchill used chloroform, and claimed good effects in modifying the spasms, and even the whole malady. But in the "Journal de Médicine," Paris, 1890, Dr. Naegeli says that in more than five hundred instances he has apparently arrested the spasm of whooping cough by pulling the lower jaw downward and forward. He states that the result of the procedure is not due to psychic influence, for this method succeeds even during sleep. He asserts that the suppression of the paroxysms exerts a good effect on the progress of the disease.

PAROTITIS.

There are two forms of parotitis, the idiopathic and symptomatic.

IDIOPATHIC PAROTITIS — (MUMPS).

Definition.— An acute, febrile, contagious disease, characterized by an inflammation of the salivary glands, especially the parotid, with a marked tendency to secondary inflammation of the testicles in the male, and of the vulva, ovaries, and mammæ in the female. It is said to be communicable before the glands are affected. The period of incubation varies from eight days to three weeks; the disease occurs but once in the same person.

The above is generally accepted as correct, but I object to the term "secondary," because there are cases in which the testicle is affected before the parotid. No mention is made of a possible metastasis or extension of the inflammation to the brain or its membranes.

I am confident that in two children I saw the hard red swelling of the gland subside, and meningitis followed soon after with convulsions, coma, and death.

J. Lewis Smith mentions the curious fact, which I have twice observed, that a person may have the disease on one side only, and after several years have parotitis on the opposite side. The submaxillary and sub-lingial glands may be the sole focus of the infection. In severe cases there is swelling of the tonsils, and œdema of the sub-mucous tissue of the pharnyx. Sometimes the pain and suffering is very great, and deglutition almost impossible. In rare cases an abscess forms, discharging outwardly or into the auditory meatus. I was cognizant of one case in which enormous enlargement and permanent induration resulted. In some instances, during the interval between the subsidence of the swelling and the secondary inflammation, alarming symptoms of collapse and cerebral irritation may appear; the face is pale, the pulse greatly accelerated, with high temperature; delirium, vomiting, and purging may occur. Laird does not think this is due to metastesis to the meninges "because the symptoms promptly disappear when the external swelling is redeveloped." But if it does not, and the patient dies?

Treatment.—The diet should consist of liquid food, milk, and gruel during the fever, and broth after. Warm, never cold, applications should be used. An ointment of belladonna or phytollacca externally, and the same medicines internally, are the most efficient remedies in nearly all cases. If the pain in the gland extending into the neck, shoulders, and head is very severe, phenacetin in doses of three to five grains every hour or two will give relief, and prevent meningitis. If pain and distress in the heart occur give cactus and spigelia. If collapse sets in, glonoine will quickly bring about reäction. In scrofulous children, merc. iod. may be needed, followed by hepar sulph. silica, or calc. hypophos. As soon as fluctuation appears, use the lancet. In cases of induration, conium, baryta iod., and inunctions of an ointment of uvedalia will generally soften and reduce the swelling if recent. For metastisis to the testicles, ovaries, and breasts, aurum, conium, and phytolacca. Salol, in doses of five to ten grains every two hours, has been highly recommended in parotitis on account of its supposed relation to rheumatism. I have not used it.

SYMPTOMATIC PAROTITIS.

Definition.—A secondary affection, not communicable, and has no tendency to involve the mammæ, testicles, or ovaries. Unlike mumps, it generally ends in suppuration. It is generally a sequel of typhoid, diphtheria, dysentery, pyæmia, and the eruptive fevers. It may attend erysipelas and ulcerative diseases of the throat. In many respects it resembles a form of mastitis, which is supposed to be caused by toxic bacteria entering the gland through the nipple.

Treatment.—If seen in the early stage, we may be able to secure resolution by means of phytolacca internally and externally applied. If suppuration threatens, give hepar sulph. and silica. If pus forms, use the lancet, under antiseptics.

Since the above was written I have treated a case of mumps which possessed peculiar interest. A well-developed girl of twelve had a not large swelling of the right parotid, which subsided on the fifth day. On the seventh she was attacked with intense nausea, vomiting, and headache, with swelling of the maxillary glands on both sides. This lasted for four days, when she complained of severe aching pains in the lower abdomen, not specially located in the uterine or ovarian regions. Pressure on the ovaries caused no pain; two days after, the menses appeared (for the first time), scanty on the first day and natural after, both in quantity and duration. As soon as the flow appeared all the other symptoms subsided. The left parotid was not affected. The medicines used were phytolacca and pulsatilla.

CARBUNCLE.

Definition.—A local phlegmonous inflammation with deap-seated pain, terminating in abscess, or a nest of abscesses, and leaving a cicatrix. It differs from the boil in that there is generally a number of openings. Simple carbuncle differs from anthrax, which originally attacks cattle, and is known as "murrain" and "charbron," and is caused by a specific bacillus, while the former is caused by a micrococcus.

Carbuncles in most cases attack the back of the neck, but they sometimes appear on the shoulders, back, and buttocks. I have

known several on the back of the head. I believe the collar, irritating with its rough edge, is the cause of the location of carbuncle on the neck. Women rarely if ever have them there.

Treatment.—Internally the same treatment as for boils, except when the inflammation is extensive and erysipelatous or œdematous, when belladonna, arsenic, apis, lachesis, and mygale are useful. Arsenic is probably the best constitutional remedy. The real anthrax is a very dangerous disease, and carbuncle often kills the old and debilitated, especially those who have long indulged in alcohol and malt liquors. If absorption of pus occurs, the most vigorous tonic treatment is required. The local treatment is to be conducted on the same principles as for erysipelas and boils. The carbolic acid should be injected in every nodule, or pustule, on or around the central inflammation, and the needle should be pushed deep into the swelling. This, in an early stage, will prevent suppuration. If we do not see the case until suppuration has occurred, the pus should be drawn out by an aspirator, or evacuated by the knife, and the cavities and honey-combed tissues thoroughly syringed out with hydrogen peroxide, five or ten volumes, and then with carbolic acid (ten per cent) or a saturated solution of pyoctanin. This treatment is better than poulticing or incisions. Compresses of lint, saturated with borated calendula, a solution of pyoctanin, or permanganate of potash are better.

In a paper read before the Academy of Medicine at Paris, Dr. Allison of Baccarat recommends the simultaneous internal and external employment of boric acid as a simple and efficacious treatment of furunculosis. He considers the carbolic acid spray, corrosive sublimate baths, and analogous means, well enough suited to hospital use, but difficult of application in private practice. The author's method, as reported by Sem. Med., consists in administering, for a week to a fortnight, eighty centigrammes (twelve grains) of boric acid daily, in two wafers. At the same time he applies externally, by gentle friction, a four per cent aqueous solution of boric acid, warm, four or five times a day. In the intervals between the frictions, compresses saturated with the same solution are applied to the affected parts. It is claimed that this treatment will abort furuncles yet in the commencement of developments, rapidly cure those already arrived at maturity, and prevent new eruptions. The

author considers the boric acid medication equally efficacious in anthrax. He has obtained a great improvement both in the local and general condition; the pain, peripheral redness, and hardness of the anthrax diminish; numerous apertures rapidly form for the elimination of the core; the fever falls, excitation and insomnia abate; and the anthrax heals, in the majority of cases, without surgical interference.

TETANUS.

Definition.— This disease is now believed to be caused by a bacillus, which has been isolated, cultivated, and has caused tetanus when injected into the blood of healthy animals. Breiger separated from the culture of this bacillus and from subjects dead of tetanus, three poisonous substances. They are ptomaines: one, tetanin, causes all the characteristic symptoms of tetanus; another causes tremors, convulsions, and subsequently paralysis; and a third causes at once intense clonic and tonic spasms. The tetanus bacillus is found in most kinds of dust and dirt, and in the manure of stables. Pathologically, the malady is supposed by a few authorities to be an inflammation of the gray matter of the cord — a central myelitis. There are two varieties, the idiopathic and traumatic, but as the symptoms are the same, and the same bacilli present, there is no need of separating them. Several drugs have the power of causing tetanus, or a condition very closely simulating it.

The first sensations of tetanus are felt about the throat, causing difficulty in swallowing; then a pain in the epigastrium, extending to the back, owing to spasms of the diaphragm; the muscles of the jaws are affected, causing trismus. Then it extends to the trunk, causing opisthotonus, emprosthotonus, and general stiffness. Spasm of the glottis may occur, causing asphyxia. One variety, Rose's head tetanus, resembles hydrophobia, and is caused by injury to the fifth nerve. One notable symptom is always present, caused by an intense hyperæsthesia of the reflexes — namely, that the slightest contact, the shutting of a door, or any jarring noise, the touch of the bed-clothing, even the contact of the air, as in fanning, will excite the convulsive paroxysms. The mind is usually clear till death. The temperature is very high, reaching 110° or higher. Death

usually takes place from apnœa. A slight wound, a foreign substance, a needle or a nail, forced into the tissues, may cause an attack of tetanus. It was once supposed that an injury to a nerve, causing inflammation, was transmitted back to the spinal cord, but this has been abandoned for the theory that the bacilli is introduced into the blood through the wound. Next to the traumatic causes, exposures to cold and wet are the most common causes. This is the exciting cause of nearly all the cases of idiopathic tetanus. A kind of tetanus is supposed to be caused by intestinal parasites; another to be excited by labor, abortion, and operations on the womb. In newly-born infants it is caused by inattention to the severed umbilical cord.

Hammond gives an excellent *resumé* of the old-school treatment. By this it appears that calabar bean, chloral, bromide of potassa, Indian hemp, and chloroform are the most successful. Dr. Yandell, commenting on the treatment of a large number of cases of which he has collected the data, says: "No agent has yet established its claim as a true remedy in tetanus."

Hammond says he has treated three cases successfully with large doses of cannabis indica and ice-bags to the spine. He expected to find in "woorara" a curative agent, but it failed.

"Hypodermic injection of one-sixth grain of carbolic acid every two hours for seventeen days cured a case of traumatic tetanus after chloral and bromide of potash failed." ("Archive de Médicine," 1891.)

Hypodermic injection of antifebrin has cured several cases of tetanus traumaticus. Two cases of traumatic tetanus have been cured by paraldehyde; dose, one hundred and fifty minims a day. Pilocarpin injections cured three cases due to a wound. Urethan is supposed to have cured one case. These citations are from European sources. Dr. J. Martin Kershaw, of St. Louis, in his article in Arndt's "System of Medicine," narrates a case of traumatic tetanus cured by gelsemium, fifteen drops in one-half glass of water, a spoonful every two hours. In my monograph on gelsemium written in 1862, I predicted that tetanus could be cured by it, but the above is the only one yet recorded in which it was used alone. Kershaw recommends belladonna, cicuta, conium, lachesis, physostigma (calabar bean) phytolacca, and stramonium; but no cures

have been reported by any of the above except lachesis and calabar. Veratrum viride has cured tetanic opisthotonus in cerebro-spinal meningitis. It is so antagonistic to strychnia that I am surprised it has not been used in tetanus by the dominant school.

The true remedies for tetanus according to the law of similia should be all those drugs which contain strychnia — namely, angustura, ignatia, nux vomica, and arnica, but we have but few cases on record in our literature of cures by their use. Bœhr says, "If there is any truth in the homeopathic law, nux vomica ought to cure tetanus." I said in my monograph on strychnia: "Until we can cure tetanus with strychnia we should be careful about boasting of the universality of the law of similia."

As I observed many years ago, "a remedy that seems exquisitely homeopathic, somehow often fails to cure." I also suggested that traumatic tetanus in which strychnia would fail to cure might be different from the idiopathic. I did not then (in 1878) know of the bacillus of tetanus.

But strychnia has cured tetanus, for Dr. Fell of New York, an old school physician, in 1847 reported seven cases treated with it, six of which it cured. One other case, reported by Dr. Kalloch, was cured by strychnia. They used doses of one-eighth to one-sixteenth grains every two hours, but observed aggravations after each dose. (Such doses would cause tetanus in a man.)

These cases were all traumatic in their origin. No cases of idiopathic tetanus has yet been cured by strychnia. How can we account for these cures by large doses? Is it possible, as a noted Canadian physician teaches in his writings, that tetanus is partial paralysis, and that the spasms are contractions of muscles because the opposing ones are paralyzed? There is abundance of proof that the secondary effect of strychnia is paralysis of the voluntary motor nerves of the whole body or a part of it, consequently of the muscular tissues. According to my law of dose, if the secondary effects are present, material doses can be used. Still, I cannot account for the seven cures made by Dr. Fell with large doses, unless, as he gave it by the mouth, only a minute quantity was absorbed. I do not dare advise larger doses than the one-thousandth of a grain in tetanus. Our school has not yet tested it sufficiently to give any satisfactory evidence as to its power in this disease.

Caffeine is nearly as homeopathic to tetanus as strychnia, but no cases have been reported showing its curative effects.

Passiflora incarnata has cured tetanus in horses and men, but it is antipathic, and must be given in massive doses. It has been found useful in tetanus neonatorum by Dr. Lindsay and Phares of Louisiana. In the tropics this disease carries off a large percentage of infants, chiefly blacks. If, as it is supposed, inattention to the umbilical cord and neglect to make it asceptic is the cause of this disease in those regions, passiflora alone will not cure. In the tetanus of horses it was found curative by Dr. Phares, who used the expressed juice of the roots, leaves, and flowers, mixed with water.

In view of the discovery of the ptomaines of tetanus, it remains for some such brilliant observer as Dr. Burnett, of London, to prepare and use these ptomaines clinically in the treatment of tetanus, and the other variety of spasms caused by them. Tetanus is epidemic in stables and in cavalry horses, but it is asserted that horses who have not been attacked are given immunity by inocculating them with the blood of those having tetanus.

Hypericum perf. is reported to have cured: "After running pins in right foot; pains run up the limb through the spine to neck and face; muscles of neck and jaw become rigid, and also muscles of chest and abdomen." (W. F. Hocking.) "Piercing wounds from pointed instruments should always be treated with hypericum to prevent any untoward symptoms." (Raue.)

Lachesis, according to Dr. I. Heber Smith, cured the following case: "One week after frost-bitten toe, which had been ulcerated, rigors, shooting pains in back, opisthotonus and trismus; remission midnight till noon; after midnight, profuse sweat and agitated sleep; throat sensitive to contact; swallowing fearful." I cannot find Dr. Smith's report of the case, which was doubtless written in more intelligible language.

SYPHILIS.

It is not intended to write extensively of this disease, as my experience has not been sufficient to warrant me in so doing. My clientel has not been of the class in which the disease is common, yet I have some very decided opinions as to its treatment.

I wonder how many of our school in modern times have read Hahnemann's masterly monograph on Syphilis, which is to be found in his lesser writings, collected and arranged by Dr. Dudgeon? It is worth while to read it even at this later day. I have lately re-read it, and compared it with that latest and most complete work on the subject by Dr. Keyes, and I find many remarkable resemblances in the two treatises.

Hahnemann declares that there is but one specific remedy—and that is mercury. Keyes has words to the same effect.

Hahnemann recommends his own preparation, the mercury solubilis — a black oxide — because it is more soluble than any other, and can quicker saturate the whole system, thereby antidoting the virus of the malady and destroying the poison. He advises that it be used in small doses, sometimes as minute as one-tenth grain, given for a long time.

Keyes advises principally the iodides of mercury for the same reason, and his treatment mainly consists in giving it in minute doses, one-sixtieth to one-tenth of a grain, continuing it for months at a time.

Compare this simple treatment with that advised in the late text-books of our school, which recommend nearly one hundred medicines for syphilis and its various complications and manifestations! I have no hesitation in pronouncing this multiplication of remedies as illogical and absurd. Not more than six of all these one hundred medicines are really indicated in syphilis, for syphilis is not an aggregation of diseases, it is one disease due to one cause, and mercury in some form is the specific for it. All other remedies which have any decided and lasting effect on the disease are similar in their action, and can act only as aids to the one grand specific. These auxiliary remedies are iodide of potash, phytolacca (which contains a large amount of potash, and acts very nearly like kali biniod.), aurum, and its salts (close congeners of mercury), bichromate of potash (which resembles mercury), nitric acid (which is an analogue of mercury), and possibly sarsaparilla and stillingia. With these few remedies I have succeeded in relieving permanently every case of syphilis that I have been allowed to treat continuously. With this I shall leave the subject, adding that the only treatment I consider of value for congenital syphilis in children is the use of mer-

cury by inunction, the officinal unguentum hydrargyri, freely and persistently, until the disease is eradicated. Even in adults, the inunction treatment sometimes gives the best results, especially in delicate women and broken-down men. I do not hesitate to recommend the physician to follow Keyes in nearly every particular

In the treatment of secondary and tertiary syphilis, iodide of potash, combined or alternated with the bichloride of mercury, gives better results than any other method.

I have carefully watched the treatment of those of our school who confine themselves to the high dilutions in this disease, and I am convinced that their asserted "cures" are unreal and illusory. Symptoms may disappear under their use, just as they disappear when no medicines at all are used, because it is the nature of the disease to have symptoms that change from one manifestion to another, continuously.

DYSENTERY.

Definition.—Under this general term are included several forms of intestinal flux, in which the principal symptoms are frequent stools, composed in part of blood and mucus, accompanied by colic (tormina) and tenesemus. Dysentery is classified as follows: (1) acute catarrhal dysentery; (2) chronic catarrhal dysentery; (3) tropical or amæbic dysentery; (4) diphtheritic dysentery. In all these the lesions are generally confined to the large bowel from the ilio-cœcal valve to the anus. Not all the bowel is affected in every case. Sometimes the inflammation is located in the transverse colon, and frequently confined to the rectum. In catarrhal dysentery the mucous membrane is injected, swollen, and covered with blood-stained mucus. The follicles are enlarged, and in children the picture is one of acute follicular enteritis. In protracted cases the follicles suppurate or are capped with an area of necrosed tissue. The old writers called this "canker of the bowels," and the phrase is used to this day among the common people. In severe cases the slough separates and the entire colon is covered with ulcers, developed from the diseased follicles, or from the intervening tissues.

In the tropical, amæbic form, the lesions consist of ulcerations, preceeded by infiltration of the sub-mucous membranes. The ulcers

are of various shapes and sizes, with infiltrated undermined edges. The visible opening of the ulcer may be small, while the tissues beyond may be undermined to a great extent, forming sinuous tracts bridged over by apparently normal mucous membrane. The cause of this form of dysentery is supposed to be an organism called the amœbe coli. It is constantly present in the stools, and can communicate the disease by infection, in the same manner that cholera and typhoid fever are communicated by being taken in food, drinking-water, or possibly by being inhaled.

Diphtheritic dysentery is a form of colitis or entero-colitis. It is essentially a diphtheria of the bowels, and has the same anatomical appearance and lesions as are found in the throat when the disease attacks that locality.

All bad cases of dysentery may cause abscesses in the liver, but tropical dysentery is more prone to cause this result than any other. Dysentery may be complicated with marsh malaria, giving it a periodic character. Woodbury in his army reports says that this was common in the army in the South. In Michigan I met with many cases, where the pain, fever, and bloody stools appeared with the regularity of an ague paroxysm.

Symptoms.—There are some symptoms in common to all forms of dysentery. All are preceded by dyspeptic symptoms, pains in the abdomen, and some diarrhœa. Usually, in catarrhal dysentery, within thirty-six hours the characteristic features develop: the colicky pain, griping, twisting, crampy, around the navel, extending into the back and hypogastrium, with frequent stools of mucus and blood, mixed with hard fœcal balls, or feculant matter. Afterwards the stools become gelatinous and bloody, sometimes almost pure blood. They vary in frequency from every two hours to every half-hour, and in severe cases the desire to evacuate is constant — the patient would like to remain on the vessel all the time. The straining, or tenesemus, accompanies every stool, and is often constant and uncontrolable. There is usually some chilliness at the commencement, followed by fever, not very high, rising during the first days to 102° or 103°. The tongue is furred and moist at first, but as the disease progresses is red and glazed. Nausea and vomiting are sometimes present, and in rare cases persistent. The thirst is often excessive. At the end of the first week the mucus becomes

opaque, with less blood, and a gray or brown shreddy substance appears in the stools, which become less frequent. Sometimes the stools are skinny, membraneous, or made up of dark-green pultaceous matter and mucus. As the disease subsides fœcal matter again appears, and the stools become infrequent. I have observed that after the stools assume their normal form they are often coated with tough bloody mucus, and are attended by pain in the hypogastrium, extending to the back and rectum. In the tropical or amœbic dysentery, which is probably the "camp dysentery" of soldiers, the symptoms are somewhat different. There is a mixture of diarrhœa and dysentery, marked by remissions and aggravations, emaciation, without much fever. The stools may contain blood and mucus, but are generally watery; from six to twelve yellowish-gray liquid stools are passed daily for weeks. Recovery is tedious, owing to muscular weakness and anæmia, with recurring relapses. The mortality is much higher than in catarrhal dysentery. This form is epidemic, and is doubtless infectious; the amœbe are carried by the water used by the soldiers in camps, or contaminated wells and streams. I have seen two epidemics of this variety in Michigan villages, originating from returned soldiers.

The symptoms of diphtheritic dysentery are very severe at the onset, when the disease is primary. The patient is attacked suddenly with high fever, great prostration, violent pain in the abdomen, and frequent discharges. Delirium is common, and the disease is often mistaken for typhoid. The abdomen is tender and distended (in catarrhal dysentery it is usually hard but flat). Blood and mucus may appear in the stools, but are not constant, nor is tenesemus always present. If the disease is secondary from other diseases, as pneumonia or diphtherial angina, the symptoms are masked and difficult of diagnosis. This disease in both forms is very fatal, the patient dying from asthenia, or a condition similar to blood-poisoning.

Chronic dysentery resembles chronic diarrhœa; the pathological conditions in both are similar. The former, however, is more prostrating and more fatal. The anæmia is more profound, and the emaciation extreme. The ghastly appearance of the face is similar to that in gastric cancer. The stools are a mixture of mucus, blood, shreddy and necrotic tissue; or are thin, frothy, and contain parti-

cles of food. I have seen many cases in which obstinate constipation lasting a week or more would alternate with dysenteric stools containing small hard scybala coated with bloody mucus. Certain articles of food may pass undigested, while other articles seem to digest well. Food which one patient can digest others cannot. Sometimes the stools are almost destitute of bile. Pus often appears in the stools in patients of scrofulous or tuberculous habit. Flatulence is a distressing symptom, causing painful distension and considerable tenderness along the course of the colon. The tongue is not often furred, but is generally beefy, or smooth and glazed.

Treatment.— Simple catarrhal dysentery is, when mild and not epidemic, a self-limited disease. Under purely dietetic or expectant treatment, it will run its course in eight or nine days. The former old-school treatment of such cases, with opium, calomel, and rhubarb in large doses, generally caused it to be protracted beyond its normal limits. The treatment by our school, with non-medicinal globules conjoined with strict diet, was so much more successful that it redounded greatly to the credit of homeopathy. In accordance with the law of similia the medicines indicated in dysentery are those that will produce in healthy persons all the phenomena of the disease. Of all drugs in the materia medica the mercurials most invariably cause dysenteric phenomena, not only the subjective symptoms, but the pathological state of the colon and other portions of the intestinal tube.

It would be useless and unnecessary for me to give all the symptoms that indicate each mercurial preparation, for the physician is supposed to know them, or can readily find them in his materia medica. I shall therefore only give my experience as to the preparations I consider most potent, and the method of administration which I prefer.

During the first ten years of my practice I used mercurius solubilis-Hahnemanni in the 3x trituration. Not meeting with the success I thought it ought to bring, I tried the sixth, twelfth, and the thirtieth. From these latter attenuations I can truly assert I never observed any decided results. Afterwards I commenced to use mercurius vivus 2x and 3x, and I believe it a more potent curative preparation than the former. Twenty-five years ago, in an epidemic of catarrhal dysentery of unusual severity, I tested both the above

preparations side by side with mercurius dulcis, and was very favorably impressed with its superiority over others, and since that time I have rarely used any other mercurial in dysentery. In the beginning of the attack I give aconite or gelsemium in alternation with mercury, so long as the high temperature lasts; then continue the mercurius alone until the subsidence of the disease.

Mercurius corrosivus corresponds to severer forms of dysentery, and when it is epidemic, or when, owing to malarial influences, it has a dynamic character. In poisonous doses it is more sure to cause all the severer pathological lesions, even to gangrene, than any other preparation of mercury. It is indicated when all the usual symptoms are intensified, and the strength of the patient is fast failing. The old school gives, as recommended by Ringer, the one-hundredth of a grain every two hours; but I know from personal observations that such doses are hazardous if continued more than a day. I have seen severe aggravations follow the use of such doses. Some persons are so susceptible to the corrosive mercury that a single dose of one-hundredth of a grain will salivate and purge, especially if the person has previously been salivated by mercury. When indicated by the severity of the symptoms, I have seen excellent results from the fourth and sixth triturations, and in very susceptible patients from the twelfth.

Podophyllum ranks next to mercury in the treatment of catarrhal dysentery. The four chief indications which I follow in its selection are: the glairy bloody stools; the violent tenesemus; the pain in the back; and griping, with nausea, before each stool. The tenesemus leads to a prolapsus recti, which indicates this drug before all others. Podophyllum can hardly cause ulceration, necrosis, or sloughing of the mucosa, but its effects may reach so far as to cause follicular inflammation. The dose ranges from the 2x dilution of the tincture, or the 6x trituration of podophyllin, for children; and one to five drops of the tincture; or one grain of the 2x trituration of podophyllin for adults — the dose to be repeated every two or four hours.

Rhubarb is an admirable remedy at the outset of the disease, as well as during its decline, when the following symptoms occur: The griping is severe, and the stools are fœcal, but soft and papescent — of a strong sour odor, and but little mucus. In all such cases the

1x trituration or dilution of the tincture, in one-grain or one-drop doses every two hours, soon arrests the disease. It is of no value for any other form.

Magnesia sulph 1x is useful for the same symptoms of the stools, but there is no tenesemus and but little griping, though the stools are profuse and frequent. It is also useful when the disease begins with copious watery stools, with rumbling and distension of the abdomen, and when the disease is caused by a sudden change of temperature; this copious watery diarrhœa commonly precedes the mucus and bloody discharges. I ought to mention that while all recent old-school authorities condemn the use of cathartics in dysentery, they advise the use of laxative doses of this drug (epsom salts) in the beginning, if the patient has been constipated. There is no salt which irritates the bowels so little as this, while the large watery stools wash away the large or small hard concretions of fœces, which, if allowed to remain, cause great irritation to the inflamed mucosa, and prolong the disease. One teaspoonful of a saturated solution of this salt, repeated every half-hour, will show its effects after three or four doses. In this connection I will observe that I am sure that the importance of cleaning out the bowel of all fœcal matter in the beginning of an attack of dysentery is not fully appreciated by our school. If the mucus and bloody discharge with tenesemus commence suddenly, not preceded by any looseness, but by constipation, no time should be lost; the colon should be washed out by an enema, or a dose of epsom salts, or carlsbad, or castor oil; then we are sure no foreign substance, scybala, or concretion of undigested food, remains to ferment or irritate the colon.

Colocynth and dioscorea are two remedies indicated chiefly by the element of pain,— colocynth when the pain is around the umbilicus and extends to the groins, legs, and sides of the abdomen, and is relieved by pressure; dioscorea when the pain is twisting, tearing, spasmodic, and radiates to the chest and sometimes to the hands and feet. Both medicines have painful flatulence. Both have rumbling and barborygmus, but neither have marked tenesemus. The stools of colocynth are feculent, mucus, and sour; those of dioscorea, fœcal, lumpy, albuminos, with burning in the rectum. Dose: 1x or 3x of colocynth; mother tincture or 1x of dioscorea. The best and most prompt effects from the latter are gained when it is given

in a hot infusion made by adding one drachm of the powdered root to four ounces of boiling water, giving a teaspoonful every fifteen minutes.

Aloes is an invaluable medicine in some cases of dysentery, but it is not indicated in general. The symptoms are few and sharply defined: when the abdomen seems to the patient to be greatly distended, but is not; when it is tender on pressure; when the descending colon and rectum are chiefly affected; the stools are scanty, watery, bloody, jelly-like, or composed of a little foul-smelling mucus, with painful tenesemus, which forces the hemorrhoidal vessels out; then this drug in doses of a few grains or drops of the 2x will promptly modify the severity of the attack.

Ipecac is useful in some cases of sporadic dysentery, but I never found it specific in the epidemic form, such as we see in the temperate zone. When the nausea and vomiting are coincident with the stools and tenesemus and the stools are dark-green, or like frothy molasses, then the 2x or 3x trituration of the powdered root acts magically. We can hardly understand the great reputation that ipecac has gained in the treatment of tropical epidemic dysentery. If we can trust the annals of Anglo-Indian physicians, it comes very near being a specific; but their method of giving it throws a doubt on its specific value. They give a preliminary full dose of opium, then twenty to sixty grains of the powdered root. If rejected, the dose is repeated. They assert its use in this manner cuts short the disease. It certainly does not act thus favorably in North America, nor, according to army surgeons during the late war, in the epidemics which prevailed in the camps. The late Dr. Whelan found it valueless in the epidemics of dysentery occurring in Camp Douglas (Chicago) during the war; but he did find that nux vomica and strychnia would cure nearly every case.

Nux vomica acts in dysentery through the spinal system. It will cause, not a true entero-colitis, but an irritation of the musculo-nervous structure of the bowels, simulating it. When a dysentery is the result of torpor of the intestines with constipation, which results in morbid irritability of the whole intestinal tract, then is nux vomica specific. The stools are small, composed of mucus mixed with hard fœcal matter, and followed by relief from pain and tenesemus: or when the anus is non-retentive from paralysis of the spine-

ter, nux or strychnia are useful. I prefer the 2x or 3x of nux and the 3x of strychnia.

Nitric acid has many symptoms in common with merc. corr., for it is a near analogue of that drug. It is capable of causing the same pathological lesions in the intestines. I prefer it to mercury when the stools are very scanty, and the tongue very red, but not dry or glazed. Dose: a few drops of the dilute acid, enough to slightly aciduate water, given in frequent teaspoonful doses. It has been observed that so soon as bile appears in the stools (the green slime in dysentery is not bile, but due to a microbe,) amelioration soon follows. This is probably due to the fact that bile is anodyne, and antiseptic in its action. The old school seek to establish the flow of bile with calomel or podophyllin, but unless very small doses are given they are liable to increase the intestinal irritation. There are, however, two medicines which increase or restore the normal flow of bile, without irritating the bowels — these are euonymin and sodium salicylate. I have frequently given euonymin 2x trituration, a tablet or one grain every two hours, with decided benefit; and I have given the sodium salicylate, a one-grain tablet of the crude, every two hours, with as good results, especially when the evacuations are offensive. I should expect good effects from this medicine in amæbic dysentery. Probably salol, which has a similar action on the liver, and on amæbe, would give better results, as it dissolves only in the intestinal secretions.

Cantharis presents a good picture of dysentery complicated with cystitis, arnica, colchicum, gambogia, croton tig. hamamelis, arg. nit. baptisia, magnesia phos., and others are occasionally useful.

Arsenicum is sometimes indicated in malarial dysentery, when its symptoms are prominent, but I have never found it useful in ordinary cases. As an intercurrent remedy for great agitation, anxiety and prostration, it acts well. When the malarial influence is decided enough to cause diurnal paroxysm of dysentery with apyrexia, quinine in doses of one grain every hour, or five grains an hour or two before the paroxysms, will arrest them. Cedron has had a similar antiperiodic effect in such cases.

Capsella bursa pastoris (shepherd's purse) has been of great value when the amount of blood in the stools amounts to a real hemorrhage. Erigeron, millefoil, turpentine, and hamamelis are equally

useful in such cases. Erigeron and turpentine are indicated when the tongue is dry, smooth, and glazed. This symptom is also found in aurum mur., which also causes as good a pathological picture of gastro-enteritis as nitric acid. I would advise a trial of gold in obstinate, chronic cases.

Certain medicines have been enumerated among the remedies for dysentery, which have no sort of relationship to that disease, and their use is a waste of time. Because some of their symptoms are similar to those of dysentery, is no indication that they are of value. Bryonia, chamomilla, apis, china, carbo. veg. conium, dulcamara, pulsatilla, etc., are never useful to combat the pathological state or the serious symptoms.

I must protest against the practice of some of our school of changing the medicine selected, because of some change in the color of the stools, their odor, or appearance. The stools in dysentery change in appearance, etc., every hour or two, and to follow these changes with new medicines is like chasing a will-o'-the-wisp. I have seen our symptom-hunting "cranks" change medicines in a case a dozen times a day, to meet the varying colors or smell of the stools, when all the time one medicine alone was indicated and should have been continued for days.

The late authorities of the old school contend that the topical treatment of dysentery is the most rational. They recognize, however, that in acute cases it is almost impossible for the patient to retain large injections. If given at all, two or more quarts of hot water, medicated or not, should be used. Hot water thrown into the colon is very agreeable and soothing. Few patients, however, can bear the introduction of the colon tube, or rectal nozzle, unless a solution or suppository of cocaine is first used in the rectum.

In one epidemic in 1857 I became desperate on account of the unsuccessful use of our best indicated medicines. If called to a recent case I began by injecting a quart of hot water, containing a teaspoonful of McMunn's elixir of opium, into the colon, the patient lying on the back with the hips elevated. In many cases, if recent, one injection was all that was necessary to arrest the disease, and in nearly all cases it was beneficial. Laudanum or opium was not useful, and did not act favorably. As a general rule opium does more harm than good in dysentery or diarrhœa. If relief from intense

pain and tenesmus is necessary, codeine is much to be preferred, as it does not constipate or cause gastric irritation. One-fourth of a grain by mouth or hyperdermatically, rarely has to be repeated more than once. If codeine cannot be obtained, the usual dose of morphine with atropine will give relief, and will not interfere with the action of the indicated specific drug.

The use of astringents,—alum, zinc, lead, copper, tannin, or brandy, ginger, etc.,—is reprehensible, and of no value. In chronic dysentery, injections of nitrate of silver have been found curative, if we can trust the reports of Drs. Hare, McKenzie, and H. C. Wood. They recommend twenty grains to the pint of water, and the amount to be injected not less than three to six pints, and allow it to run into the colon through a fountain syringe. "It is at times intensely painful and rejected at once." Without denying its curative action in chronic cases, I believe we have less dangerous remedies at our command, but I should not hesitate to use it in desperate cases.

Osler says quinine has been used successfully in the Johns Hopkins Hospital in amœbic dysentery. The solution used varied from 1 to 1,000 to 1 to 2,500. He says the amœbæe are rapidly destroyed by it. Probably they are, but quinine is not at all indicated for the intestinal inflammation. I have known a quart of peppermint infusion, or extract hamamelis, one part to three parts of water, used with apparent success. In one epidemic I used with good effect an infusion of eucalyptus leaves, in another a distilled extract of eucalyptus. An external application of dilute arnica tincture, or turpentine, will often relieve the great tenderness of the abdomen; they may be incorporated in a poultice or on cotton or wood-wool.

Diphtheritic dysentery requires the same medicines as for diphtheria in other locations. The most prominent are merc. cyan., kali bichromatum, phytolacca, and kali permanganate. The diet should be restricted in acute cases to milk, which should be Pasteurized or peptonized unless fresh from the cow. Next to milk come whey, broths (particularly lamb or mutton broths), gruels made of rice or barley flour (never of oatmeal). When starchy food is given it is advisable to give with each meal a small quantity of diastase. When the disease is subsiding, Libby's meat-juice may be given, and the patient allowed to chew roast beef, or dried beef, swallowing only the juices. The best beverage is white of egg beaten up in water,

two or three being used for each gobletful, with the addition of a little sugar. In long-lasting or chronic cases a stronger diet can be used, but never a large quantity at once. There is an unfounded objection to the sub-acid juice of fruits. I have seen the best results from the juice of grapes, peaches, and the grape-fruit — a large species of the orange family. In some cases peaches, if ripe and not too acid, can be eaten with benefit. Bacon is always relished, and if the fat only is swallowed never disagrees with the patient. One of the greatest obstacles to the cure of dysentery in children is their restlessness. If kept quiet, and not allowed to sit up while at stool, a greater number would recover.

CHOLERA ASIATICA.

The history and etiology of cholera, if fully given, would fill a volume. All that is required in a work of the scope of this book is a brief and clear account of the pathology, symptoms, and treatment of the disease. I find no writer gives such a clear description of cholera, in as few words, as Osler, in his "Practice of Medicine," and as he is an exponent of the most recent discoveries in pathology, his statements may be relied upon. I therefore quote his etiology and pathology, with a few observations and additions of my own.

"*History.*—Cholera has been epidemic in India for a remote period, but only within the present century has it made inroads into Europe and America. An extensive epidemic occurred in 1832, in which year it was brought in immigrant ships from Great Britain to Quebec. It traveled along the lines of traffic up the Great Lakes, and finally reached as far west as the military posts of the Upper Mississippi. In the same year it entered the United States by way of New York. There were recurrences of the disease in 1835-1836. In 1848 it entered the country through New Orleans, and spread widely up the Mississippi valley and across the continent to California. In 1849 it again appeared. In 1854 it was introduced by immigrant ships into New York, and prevailed widely throughout the country. In 1866 and in 1867 there were less serious epidemics. In 1873 it again appeared in the United States, but did not prevail widely. In 1884 there was an outbreak in Europe. Although

occasional cases have been brought by ship to the quarantine stations in this country, the disease has not gained a foothold here since 1873.

"*Etiology.*—In 1884 Koch announced the discovery of the specific organism in this disease. Subsequent observations have confirmed his statement that the comma bacillus, as it is termed, occurs constantly in the true cholera and in no other disease. It has the form of a slightly bent rod, which is thicker but not more than half the length of the tubercle bacillus, and sometimes occurs in an S form. It is not a true bacillus, but really a *spirochæte*. The organism grows upon a great variety of media, and displays distinctive and characteristic appearances. The bacilli are found in the intestines, in the stools from the earliest period of the disease, and very abundantly in the characteristic rice-water evacuations, in which they may be seen as an almost pure culture. They very rarely occur in the vomit post-mortem; they are found in enormous numbers in the intestines. In acutely fatal cases they do not seem to invade the intestinal wall, but in cases with a more protracted course they are found in the follicles, and even in the deeper tissues. They require an alkaline medium for their growth and development.

"*Modes of Infection.*—(1) Contagion.—It appears probable that cholera is not highly contagious in the same sense as small-pox and scarlet fever, but in this respect is very similar to typhoid fever. Physicians, nurses, and others in close contact with the patients are often not affected. On the other hand, such persons as washerwomen, who are brought into very close contact with the cholera stools and the linen of cholera patients, are particularly prone to the disease.

"(2) Infection.—The leading authorities now agree that the disease is propagated chiefly by the contamination of water used for drinking, washing, and cooking. It is quite possible that articles of food may be contaminated, particularly vegetables, such as lettuces, cresses, and others, which have been washed in infected water; also on the skin of fruit sold at fruit stands, and kept at night in filthy rooms where cholera has been, but this is probably a minor danger in comparison with impure drinking-water. The bacilli, under suitable circumstances — that is, when much impurity is present — may develop to some extent in the water. Koch, as is well known, found the bacilli in a tank in India from which the inhabitants were sup-

plied with water for drinking and washing. Strongly in favor of this view is the fact that the virulence of an epidemic in any region is generally in direct proportion to the imperfection of the water supply. On the other hand, with improvements and perfection in the waterworks of a place, the epidemics are reduced in intensity, and the place may even obtain immunity against the disease. Not only in India has the demonstration of the connection between drinking-water and cholera infection been amply furnished, but in England there have been many valuable illustrations. One of the most notable of these was the celebrated Broad street pump, in London, which, in 1854, was connected with a severe epidemic. Milk also may possibly in some instances convey the poison. The germs may be conveyed through the atmosphere. This has been denied, but it is difficult to account for genuine isolated cases on any other theory.

"*Symptoms.*—A period of incubation of uncertain length, probably not more than from two to five days, precedes the development of the symptoms. Three stages may be recognized in the attack: the preliminary diarrhœa, the collapse stage, and the period of reaction.

"(1) Preliminary Diarrhœa.—This may set in abruptly without any previous indications. More commonly there are, for one or two days, colicky pains in the abdomen, with looseness of the bowels, perhaps vomiting, with headache and depression of spirits. There may be no fever.

"(2) Collapse Stage.—The diarrhœa increases, or, without any of the preliminary symptoms, sets in with the greatest intensity; and profuse liquid evacuations succeed each other rapidly. There are in some instances griping pains and tenesmus. More commonly there is a sense of exhaustion and collapse. The thirst becomes extreme; the tongue is white; cramps of great severity occur in the legs and feet. Within a few hours vomiting sets in and becomes incessant. The patient rapidly sinks into a condition of collapse, the features are shrunken, the skin of an ashy gray hue, the eyeballs sink in the sockets, the nose is pinched, the cheeks are hollow, the voice becomes husky, the extremities are cyanotic, and the skin is shrivelled, wrinkled, and covered with a clammy perspiration. The temperature sinks. In the axilla, or in the mouth, it may be from 5° to 10° below normal, but in the rectum and in the internal

parts it may be 103° or 104°. The pulse becomes extremely feeble and flickering, and the patient gradually passes into a condition of coma, though consciousness is often retained until near the end.

"The fæces are at first yellowish in color, from the bile pigment, but soon they become grayish white, and look like turbid whey or rice-water — whence the term 'rice-water stools.' There are found in it numerous small flakes of mucus and granular matter, and at times blood. The reaction is usually alkaline. The fluid contains albumen, and the chief mineral ingredient is chloride of sodium. Microscopically, mucus and epithelial cells and innumerable bacteria are seen, the majority of the latter being the comma bacilli.

"The condition of the patient is largely the result of the concentration of the blood consequent upon the loss of serum in the stools. There is almost complete arrest of secretion, particularly of the saliva and the urine; on the other hand, the sweat glands increase in activity, and in nursing women it has been stated that the lacteal flow is unaffected. This stage may not last more than two or three hours, but more commonly lasts from twelve to twenty-four. There are instances in which the patient dies before purging begins — the so-called *cholera sicca*. This form often occurs after a fright, or shock from fear.

"(3) Reaction Stage.— When the patient survives the collapse the cyanosis gradually disappears, the warmth returns to the skin, which may have for a time a mottled color, or present a definite erythematous rash. The heart's action becomes stronger, the urine increases in quantity, the irritability of the stomach disappears, the stools are at longer intervals, and there is no abdominal pain. In the reaction the temperature may not rise above normal. Not infrequently this favorable reaction is interrupted by a recurrence of severe diarrhœa, and the patient is carried off in a relapse. Other cases pass into the condition of what has been called cholera-typhoid, a state in which the patient is delirious, the pulse rapid and feeble, and the tongue dry. Death finally occurs with coma. These symptoms have been attributed to uræmia."

Diagnosis.— The only affection with which Asiatic cholera could be confounded is the cholera nostras (morbus) — a severe choleraic diarrhœa which occurs during the summer months in temperate climates. The clinical picture of the two affections is identical. The

extreme collapse, vomiting, and rice-water stools, the cramps, the cyanosed appearance, are all seen in the worst forms of cholera nostras, or cholera infantum. In enfeebled persons death may occur within twelve hours. It is, of course, extremely important in some instances to be able to diagnose between the two affections. "This can only be done by one thoroughly versed in bacteriological methods, and conversant with the diversified flora of the intestines. The comma bacillus is present in the dejections of a great majority of the cases, and can be seen on cover-glass preparations. Though the eye of the expert may be able to differentiate between the bacillus of true cholera and that which occurs in cholera nostras, cultures should be made, from which alone positive results can be obtained." (Olser.) Poisoning by arsenic, copper, veratrum album, phytolacca, podophyllum, castor oil beans, euphorbia cor. iatropha, and merc. corr., all present symptoms almost identical with those of cholera. Fright and fear will in some sensitive persons cause similar symptoms. Aconite causes a condition resembling cholera *sicca*.

Prevention.— The first step to be taken by the government of any city or state, when cholera is present in a foreign country, is to establish the most rigid quarantine at every avenue of entrance, by ships, railroads, or any other means of travel. On several occasions cholera has been brought to various parts of America, but has been checked by quarantine. The general government of the United States should exercise chief supervision over quarantine during the prevalence of epidemics in foreign countries. For this reason I am in favor of a national board of health.

The next method of prevention is to perfect the sanitary condition of towns and cities. Sewers, cesspools, gutters, pools of stagnant water, out-of-door water-closets, may all be sources of infection and culture-mediums for the bacillus. When the sewers of a great city empty into a lake or river, the water for many miles becomes infected, and often goes back to the city through the intakes of the cribs, and into the dwellings of its inhabitants. During the prevalence of any epidemic (especially of cholera and typhoid), all the water for drinking, or used for washing cooking utensils, should be boiled. Mere filtering, even with a Pasteur filter, is not sufficient, for even if the bacillus is filtered out, the toxic excretions from them pass through, and can be destroyed only by boiling for at least five

minutes. Water-closets and cesspools, filthy gutters, and all standing pools should be cleaned at night, and thoroughly flushed with a solution of sulphuric acid or sulphate of copper. One pound of either will make several barrels of disinfecting fluid.

All persons should pursue their usual vocations, to occupy the mind and prevent it from dwelling on the disease. Fright and fear are great predisponents. I know of many instances in my own practice in which a morbid fear of the cholera was the exciting cause of a fatal attack. Indeed, such were their isolated surroundings, and the care they exercised, that I doubt if bacilli had anything to do with the attack. Morbidly sensitive persons should not read about cholera, nor should the disease be discussed in their presence. The habitual diet should not be changed, except to eliminate such articles of food as unripe or overripe fruits and vegetables, and stale or "high" meats. All ripe clean fruits and vegetables, especially if cooked, are allowable. In persons habitually accustomed to the use of wines and liquors, their moderate use should be kept up. The acid wines are best, also acid fruits, for the comma baccillus cannot live long in an acid medium. A low diet of unsubstantial food is dangerous.

In the sick-room the stools and linen of the patients should be thoroughly disinfected by the use of sulphuric acid, Platt's chlorides, or carbolic acid, or destroyed by fire.

Medicinal Prophylaxis.— It was hoped that a protective virus prepared according to the rules of Pasteur would be found; but inoculations with such virus have not been satisfactory. There has been no proof of their positive preventive power.

It has been observed that the workmen in copper manufactures and copper smelters, and even those who live in their immediate neighborhood, generally escaped the cholera. This has led to the use of copper internally and externally as a preventive. Cuprum metallicum 3d and 6th, as advised by Hahnemann, have been given during epidemics, with the apparent result of preventing the disease; small bands or discs of copper have been worn around the waist, or on the epigastrium, with apparently protective effects.

I prefer the arseniate or arsenite of copper, for I believe arsenic has also protective powers. The arsenite of copper is very soluble, and is readily absorbed into the circulation. Tablets, or pills, con-

taining the one-hundredth, one-five-hundredth, and one-thousandth are now used. Either preparation can be used, the dose varying with the age and susceptibility of the individual. A dose morning, noon, and night, after meals, may prove a preventive. Veratrum album has been recommended as a preventive, but I doubt its value. It is best indicated when the attack is present, or during the initial diarrhœa.

As the comma bacillus must have an alkaline medium for its development, it has been suggested that in order to protect against it, the intestinal and gastric secretions should be kept in an acid condition. Sulphuric acid has been used for this purpose. It is prepared as follows: A few drops, ten or fifteen, of the dilute acid are added to a glass of water, with or without a small quantity of sugar, and flavored with a slice of lemon if desired. It is about the one-two-thousandth solution. This makes a mild acid drink, and several glasses daily can be used without injurious results. On the contrary, it is a tonic; it improves digestion and will prevent and cure most forms of atonic diarrhœa. This acid has been employed with great advantage in epidemics of cholera by Dr. Curtis in the Philadelphia Almshouse, insane department. A very serious epidemic ceased in twelve hours after the inmates were all put upon the free use of sulphuric-acid lemonade. The only new case after this was that of a man who refused to use the prophylactic. Two days after the use of sulphuric acid was stopped two new cases occurred, and the epidemic was again arrested by the use of the sulphuric acid. In the surgical wards the acid was used from the beginning of the epidemic, and in these wards, although in no way isolated, the disease failed to make an appearance. In view of this statement of facts it should be used freely and early. In such small quantity, the acid is not absorbed into the blood, and if it is it will not disturb its normal alkalinity, being immediately neutralized.

Phosphoric acid is nearly as valuable, prepared in the same manner. The "acid phosphates" are not useful, and may be injurious, for they separate in the stomach, leaving an alkaline or neutral solution. Lime juice, lemon juice, or vinegar in water may all be useful.

In Dr. Moore's "Report on the Cholera Epidemic of 1849" I find the following: "Dr. Tommaso Cigliano gives a very interesting account of the cholera in Naples in 1884. In this account the high

reputation of camphor in cholera is fully sustained, and much additional testimony is given in reference to its power as a preventive of the disease; this is a matter of the most vital moment, and supplies a missing link in reference to what is known as prophylactic treatment of cholera. Hitherto cuprum only was ascertained to have such properties, but camphor being a much more easily managed medicine the gain of such knowledge is no small advantage. On this head Dr. Cigliano states that he, in common with his colleagues, Drs. Rubini, Mucci, and Orioli, administered camphor to their private patients, families, and households, amounting in all to about 2,000 persons, during the period the disease was raging in Naples, as a protective measure, and not one of those people took the disease. They gave drop doses thrice a day; then at their free dispensary they gave camphor to the public generally. They calculate that about 50,000 persons in all in the city took camphor. They confidently affirm that not one of said persons died of cholera, though they nursed, in some instances, cholera patients, and lived in houses where patients died of the disease; and thus, with very few exceptions, all the above escaped an attack. [A disc, or tablet, contains two drops of camphor. One of these four times a day should be taken when the disease is prevailing.] Thus we have accumulated testimony to the efficacy of this potent remedy as a preventive of the disease, as well as to its curative power. Then, in reference to the external applications of camphor, Dr. Cigliano states that when camphor could not be given internally, as in the case of children, it answered equally well if rubbed in on the temples, armpits, and over the stomach. This testimony is very assuring, as in some cases it cannot be borne on the stomach in quantities sufficient to produce the necessary reaction — hence the importance of this observation. In addition to the above he recommends it in the form of enema with warm oil, if needful. His dose internally was five drops frequently repeated. The mortality under regular treatment in this epidemic was very high. From August 2 to October 10 there were attacked 11,384 persons; of these, 6,042 died.

"Though the homeopathic doctors pressed upon the authorities the immense advantages of adopting homeopathic treatment, the Minister of the Interior declined on technical grounds, and Death may be truly said to have had his undisputed sway, if, indeed, he

had not in many instances been helped by haphazard Allopathy. The veteran Rubini, now eighty-four years of age, but still full of youthful vivacity, actually offered to take charge of half of the cholera hospitals, which, with his colleagues, he could have done, and I doubt not have saved many lives; but ignorance, prejudice, and officialism combined to prevent it."

The acid preventive treatment can be given together with the cuprum, or camphor. The selection of the two latter medicines will depend on the genius or characteristic symptoms of the prevailing epidemic. Camphor is not such an antidote to other drugs as has been taught by some authorities, for many eminent practitioners have alternated it with other remedies in the treatment of cholera, and have not observed any antidotal action from it.

Treatment.— In the initial stage, usually termed cholerine, a diarrhœa which sometimes precedes for several days the violent symptoms, the diet should be restricted to plain nutritious food and drinks. If the acids do not prevent or arrest it, select the remedy carefully according to its characteristic symptoms. The experience of our school has been that camphor is here the chief remedy. I have seen cases, however, which required merc. cor. iris, podophyllum, and arsenicum. If you are using the arsenite of copper as a preventive, do not stop its administration, but give smaller doses. If the patient is taking the 2x, give the 3x. The use of opium, and all preparations containing that drug, is certainly injurious; so are ginger, capsicum, and other similar aromatic and astringent drugs. When the pain in the bowels is violent, and resists fomentations and the selected remedy, a hypodermatic injection of codeine phos., one-half a grain is admissible.

The onset of cholera is often sudden, and not preceded by any looseness of the bowels. The patient is stricken with violent vomiting and purging and immediate collapse. In such cases he should be put into a warm bed between flannel sheets, and not allowed to go to the water-closet, but made to use the bed-pan. Camphor, a concentrated tincture ("Rubini's camphor"), should be given in doses of five drops every ten minutes, until the symptoms are mitigated. It is the universal testimony of the homeopathic and of a portion of the regular school, that camphor is a powerful remedial agent in these sudden and violent cases. My experience with cam-

phor, given in pure chloroform, for cholera morbus and cholera infantum, impels me to recommend it in true cholera. Ten drops of the mixture, equal parts, would be the dose for adults, one to two drops for children. When the attacks come on more slowly, and the evacuations are not yet like rice-water, but yellow, greenish, slimy, and attended by griping, tenesmus, cramps in the legs, thirst, great anxiety, and restlessness, arsenite of copper 2x should be given to adults every half-hour (for children the 3x is sufficient). If the cramps in the abdomen are violent, give colocynth or dioscorea in alternation.

Veratrum album is fully indicated during the first and second stages. This is the opinion of the late Dr. John Moore, of Liverpool, who asserts in his report on the cholera of 1849 that he found the mother tincture to act better than the dilutions. Veratrum album does not correspond to the extreme degree of collapse indicating arsenic; for there are few if any records of death from the effect of veratrum in poisonous doses, while deaths from arsenic and copper have been frequently recorded. Veratrin in doses of one-five-hundredth grain every hour (two grains of the 3x) has been used successfully when the characteristic symptoms were violent cramps in the lower extremities, attended by shocks like those of electricity. In the early edition of my "New Remedies," I recommended ricinus communis (seeds of the castor oil plant) for cholera, as their poisonous effects have a closer resemblance to true cholera than have those of veratrum album.

Dr. L. Salzer, of Calcutta, in his excellent work on cholera, — the best ever written by one of our school,— says he has used ricinus very successfully in several epidemics in India. He also found it "superior to all other remedies in choleraic diarrhœa." Another Indian physician, Dr. Baduri, editor of the "Indian Homeopathic Review," reports it "very successful when veratrum failed." Both used it in the 3d dilution.

Dr. Holland, of Bath, England, values iatropha 3x very highly, after veratrum failed. The symptoms of iatropha and ricinus are quite similar. The oil of cajuput has in India proved useful in cholera, especially after it has been kept in copper vessels. In all the stages of cholera I do not believe there is any remedy which will give better satisfaction than cuprum-arseniosum. It not only corresponds to

nearly all the symptoms which cholera presents, but it has an antidotal effect on the general condition caused by the bacillus. Unless in exceptional, unique, or complicated cases, I believe our success will be better if we adhere all through the disease to the use of this drug, giving other remedies only intercurrently.

Some writers have theoretically recommended secale and carbo veg. in the stage of profound collapse, but no trustworthy testimony has ever been adduced as to their real restorative power. (Theoretically, Helleborus niger ought to have a curative effect in the coma following collapse.)

Although Dr. Sircar, of Calcutta, asserts that he has seen striking benefit from hydrocyanic acid in rapid collapse, I believe arsenicum, aided by phosphorus, glonoine, or aconite, or aconitine one-thousandth grain every hour (one grain of the 8x trituration) will do all that medicines can do.

To quench the intense thirst there is no drink so beneficial as hot water — as hot as patients can swallow it. They can sip it, or drink large quantities. It does not aggravate the vomiting, but generally allays it. Cold water may be permitted, but never in large quantities. It should be sipped, and can be made ice-cold, or small pieces of ice can be swallowed. Injections of hot water into the bowels, two or three pints at a time, have been beneficial. If aciduated slightly with sulphuric acid better results might be obtained.

Peroxide of hydrogen may possibly prove of great value. It is so inimical to all toxic germs and organisms that it may kill the comma bacillus outright. I do not know that it has ever been suggested, but its value should be tested if the usual medicines fail to have good effects.

In the stage of collapse owing to the profuse serous discharges, the blood becomes concentrated, and absorption takes place rapidly from the lymph spaces. This gives the shrunken, puckered appearance to the features and skin of a patient in this stage. For this condition, Osler and others recommend an intra-venous injection of a saline solution. For this common salt should be used, about four grammes (one drachm) to the litre (one quart) of pure water, previously boiled. (See "Medical Record," Vol. 41, No. 1, Jan. 2, 1892; article by Dr. H. M. Dambarn.)

"With rubber tubing, a canula from an aspirator, or even with a hypodermic needle, the warm solution may be allowed to run by pressure beneath the skin. It is rapidly absorbed, and the process may be continued until the pulse shows some signs of improvement."

This is a valuable method, thoroughly physiological, and should be tried. It is said that enemata of salt-water into the bowels has been used successfully in the present epidemic in Hamburg, decreasing the death-rate fifty per cent.*

The stage of reaction is generally attended by fever. In this condition baptisia, gelsemium, and aconite are useful. If an inoffensive diarrhœa continues, salol in doses of two grains every four hours is an admirable remedy. The diet during the stage of reaction, and during convalescence, should be carefully watched, or relapses will occur. Bland farinaceous foods or plain meat broths are allowed, but no solid food should be swallowed for some time. The food should be often, in small quantities. One of the most annoying *sequelæ* is suppression of urine. Turpentine, cantharis, and apis are most useful. Drs. Drysdale and Moore recommend kali bichromatum, having found it useful. For an extensive history of cholera, I refer the reader to Dr. J. P. Dake's excellent article in Arndt's "System of Practice," which is worthy of being consulted.

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*Since the above was written the following telegram from New York would seem to show that salt-water injections would be not only useless but injurious:

"Dr. Paul Gibier, of the Pasteur Institute, and president of the Bacteriological Institute, of this city, completed this afternoon an investigation in connection with the cholera germs, the results of which put a new phase upon the work of preventing the spread of the disease. As a preventive of cholera, salt-water bathing has been recommended. Dr. Gibier has been experimenting for some time at his laboratory to determine if the cholera germs possess the necessary vitality to live in salt-water or the ordinary sea-water. As a result of these experiments he conclusively demonstrated that the germs can exist in salt-water a long time, for several days at least, and possibly for a week or two. He is, moreover, authority for the statement that the cholera germ propagates in salt-water. He believes that while existing in the water these germs naturally drift with the tides or currents, and coming ashore spread the poison upon whatever they attach themselves to. The germs upon which Dr. Gibier has experimented have been in his possession some time, and the investigation has been carefully conducted."

TUBERCULOSIS.—SCROFULA.—PHTHISIS.

I do not intend in this work to give a comprehensive history, etiology, etc., of this disease. Nor shall I pretend to give any curative drug treatment, for it can truthfully be said that there is at present no medicinal treatment worthy of that name. The disease we know under the name of consumption of the lungs and phthisis is but a local manifestation of a condition known as tuberculosis. In order that you may have a clear idea of what tuberculosis really is, I shall summarize the most recent facts (not theories) of all the most eminent pathologists.

Osler ("Practice of Medicine") is probably the best exponent of these facts, and I shall follow him.

"(1) Tuberculosis is an infectious disease, caused by the bacillus tuberculosis, the lesions of which are characterized by nodular bodies called tubercles, or diffuse infiltration of tuberculous tissue which undergo caseation or sclerosis, and may finally ulcerate, or in some situations calcify."

This is a brief, comprehensive statement of the general condition. It is one of the most wide-spread of all maladies. It rarely if ever attacks cold-blooded animals, although it has been found in a few reptiles in confinement. Among birds and fowls it is very common. It is common among ruminants, especially the bovine species.

"I believe firmly that all the tuberculosis that affects the human race is derived from the domesticated bovine, because the only people on the face of the earth who enjoy immunity from tuberculosis are those who do not harbor domesticated tuberculous animals." (Dr. E. F. Brush, "Dietetic and Hygienic Gazette.")

It is rare in sheep; common in hogs; rare in horses, dogs, cats, rabbits, and guinea pigs, unless infected by human beings. Apes and monkeys in a wild state do not have it, but contract it when in confinement. It is found in all countries, but rare near the poles, in the high regions of the Alps and Andes, and on the central plateau of Mexico. The Rocky Mountains and California enjoy no special immunity. No race is exempt from its ravages. The aborigines of this country, even in its most salubrious localities, suffer from it. The negro race is very susceptible to it. Osler

gives a very interesting history of the discovery of the bacillus by Koch, and ends with this remarkable sentence: "It forms one of the most masterly demonstrations of modern medicine. Its thoroughness appears in the fact that in the nine years which have elapsed since its announcement, the numerous workers at the subject have not, so far as I know, added a solitary essential fact to these presented by Koch." Osler's history of its mode of growth, products, distribution, and modes of infection, is alone a sufficient inducement to every physician to study his "Practice of Medicine." He believes there is enough testimony to prove that tuberculosis is hereditary, but in what way is an unsettled problem. A most curious fact is that the "viscera of a fœtus born of a phthisical mother were infective to guinea pigs." "It is universally conceded," says Osler, "that only tuberculous matter can produce when inoculated tuberculosis." Gregg, in his presumptuous essay on "Consumption," denies this; but who will accept the mere dictum of a Gregg against the scientific opinion of Osler and Koch?

The ways of infection are innumerable. Men who handle dead animals are infected through abrasions in the skin. It may be contracted from unclean knives which have cut into tuberculous tissues; the wearing of earings once worn by consumptives; the bite of a tuberculous subject; washing the clothes of a tuberculous patient. It is denied that it can be communicated by humanized vaccine virus, but I believe it can when the substance used is not absolutely pure vaccine lymph.

Years ago when the "scab" from human subjects was used, I have seen many undoubted cases of infection causing tuberculosis. Although it is denied that the expired air of tuberculous patients is infective, the statement should be qualified. I see no obstacle to the presence of bacilli in the expired air during an attack of coughing, and I would not advise one to breathe such forcibly expired air. It is not denied that the virus often exists in great quantity in the air of cities, hospitals, rooms where consumptives live, and especially in railroad cars. I believe the sleeping-car and the dining-car to be potent factors in the spread of phthisis. These two kinds of cars are often combined, as in the buffet-cars. During certain seasons, nearly every sleeping-car running west and south contains one or more consumptive patients. If ever so careful some

of their sputum gets upon the floor. In a heated car it soon dries, especially during the night. In the morning the porter sweeps the car, and in the dust that arises are millions of tubercle bacilli; they settle upon everything and are breathed in by all the passengers. While the infected dust is still floating in the air, breakfast is brought in, and the bacilli settle upon the food and are eaten. I will not dwell upon this revolting subject, but it impels me to caution people not to travel in a car with a phthisical person. It may be necessary, when hygiene is better understood by the public, to pass a national law which shall require separate cars for the tuberculous or greater care in their management, and perhaps the prohibition of eating in a sleeping-car. Tuberculosis is very prevalent in institutions in which the residents are denied fresh air with a free open life, as in numerous cloisters, asylums, and prisons. It is believed by investigators that it can be contracted from a tuberculous husband by the wife, and vice versa. If one of a family of several dies of phthisis, the remainder often die of the same disease if they continue to live in the same house; but if one member leaves and resides in another locality, this one escapes. This I have seen verified in many instances. The infection may be contained in the milk of cows that have tuberculosis. This has been proven beyond a doubt. Meat may contain the virus and propagate the disease unless thoroughly cooked. But the meat of all animals that have tuberculosis should be forbidden to be used as food. I ought to mention that Dr. T. H. Mays, of Philadelphia, denies the contagiousness of consumption, and in a paper in the "Therapeutic Gazette," March, 1889, brings a vast amount of apparently incontrovertible proof in support of his assertion. Dr. Mays also published an essay on "The Nervous Origin of Phthisis," alleging the bacilli to be only a secondary result.

Tuberculosis occurs at all periods of life. Its manifestations vary at different ages. During the first ten years it attacks the lymphatic glands, bones, and meninges of the brain. The cervical glands in young children are frequently affected. From the tenth to the fortieth year, pulmonary tuberculosis is most common. The local conditions which favor tuberculosis are certain soils and localities among which are low, damp, poorly drained soils. But in such localities catarrhal conditions are prevalent, and catarrhal states of the mucous

membranes afford the best soil for the implantation of the bacilli, and it may be stated as a general fact that the germs of tuberculosis in a majority of cases gain entrance to the body through the respiratory organs.

ACUTE TUBERCULOSIS.

Osler says, "For practical purposes it may be divided into three classes: (1) Acute general infectious; (2) pulmonary; (3) cerebral or cerebro-spinal. The acute general infection is often mistaken for typhoid fever, and is with difficulty diagnosed from it. The pulmonary may be mistaken for pneumonia, but the meningeal form is unmistakable."

For details of etiology, symptoms, and diagnosis, consult Osler's "Practice," and Arndt's "System of Medicine."

SCROFULA (Tuberculosis of Lymph Glands).

The definition now given of scrofula is, that scrofula is tubercle, and that the bacillus of Koch is its principal element. If there is any difference it is that the virus which produces the chronic adenitis, or scrofula, is of a milder character, a more attenuated form. This seems to be proven by experiments. Olser gives as follows the principal features of interest in tuberculosis adenitis:

"(1) *The local character of the disease.* Thus, the glands of the neck, or at the bifurcation of the bronchi, or those of the mesentery, may be alone involved.

"(2) *The tendency to spontaneous healing.* In a large proportion of the cases the battle which ensues between the bacilli and the tissue-cells is long; but the latter are finally successful, and we find in the calcified remnants in the bronchial and mesenteric lymph-glands evidences of victory. Too often in the bronchial glands a truce only is declared, and hostilities may break out afresh in the form of an acute tuberculosis.

"(3) *The tendency of tuberculosis adenitis to pass on to suppuration.* The frequency with which, particularly in the glands of the neck, we find the tuberculosis processes associated with pus is a special feature of this form of adenitis. In nearly all instances the pus is sterile. Whether this suppuration is excited by the bacilli or by

their products, or whether it is the result of a mixed infection with pus organisms, which are subsequently destroyed, has not been settled.

"(4) *The existence of an unhealed focus of tuberculous adenitis is a constant menace to the organism.* It is safe to say that in three-fourths of the instances of acute tuberculosis the infection is derived from this source. On the other hand, it has been urged that scrofula in childhood gives a sort of a protection against tuberculosis in adult life. We certainly do meet with many persons of exceptional bodily vigor who in childhood had enlarged glands."

The infection may be general, attacking all the lymph-glands of the body; or local, affecting the cervical and submaxillary, popularily known as kernels: the bronchial and the mesenteric.

PULMONARY TUBERCULOSIS.

Three varieties of pulmonary tuberculosis are now recognized: (1) tuberculo-pulmonary phthisis; (2) chronic ulcerative phthisis; (3) fibroid phthisis. Osler says there are two distinct types of lesion according to the mode of infection: (1) when the bacilli reach the lungs through the blood-vessels, and (2) when the bacilli reach the lungs through the bronchial tubes by inhalation.

Those who desire to consult the most recent facts of the pathology and diagnosis of this disease should consult Osler's work, which is now generally accepted by specialists. If the bacilli are not found after repeated examination by a competent microscopist the disease is not true tuberculosis. In such cases the malady may be chronic bronchial catarrh or simply fibroid phthisis. Sir Andrew Clark, in a lecture on fibroid phthisis recently delivered at the London Hospital, said: "It has been alleged by Koch, and it is generally believed in London, that every case of phthisis, as I have defined it, is microbic, and associated with and dependent upon the presence and the action of tubercle bacilli. For my own part I presume to deny the allegation, and to contend that while the great majority of cases of phthisis are bacillary, there is a considerable minority of cases which are non-bacillary, in which at no period in their history can bacilli be found." The prognosis in tuberculosis has always been gloomy, except by charlatans, who for commercial purposes

claim its curability by medicines. I do not deny the curability of phthisis, but I do affirm that the cures by drugs alone are exceedingly rare. Indeed, spontaneous cures are much more frequent than medicinal. Many years ago, Flint called attention to the self-limitation and intrinsic tendency to recovery in well-marked cases of pulmonary tuberculosis. Of his 670 cases, 44 recovered, and in 31 the disease was arrested; spontaneously in 23 of the first group, and 15 of the second. Osler says, "In many cases a natural or spontaneous cure is effected, for the conditions favorable to the development of the disease are not present — in other words, the tissue-soil is unsuitable." Now, if we can find out how to render the tissue-soil unsuitable, we shall advance one step towards the discovery of a means of cure.

The duration of pulmonary tuberculosis is very variable. Laennec says two years, and this is as nearly correct as can be arrived at. Pollock's 3,500 cases show the average duration to be about two and one-half years. The question of marriage of tuberculous subjects may become in time regulated by law. When a man or woman has a cough with fever, and bacilli are discovered in the sputum, marriage should be forbidden, at least until the bacilli or other local signs of tubercle have disappeared. A man or woman who has a family history of tuberculosis should not be permitted to marry. Child-bearing increases the risk. Pregnancy, contrary to the opinion held several years ago, does not prevent phthisis. It may cause an apparent arrest, but the disease is pretty sure to resume its sway after parturition.

The prophylaxis of tuberculosis is a momentous question. If the children of tuberculous parents grow up delicate, pale, narrow-chested, and with enlarged lymphatic glands, they should be removed if possible to some climate noted for its antagonism to phthisis. If one of such family dies of phthisis this separation becomes imperative if any of them are to be saved. A mother with pulmonary tuberculosis should not suckle her child. It should not only have a healthy wet-nurse, but should be removed to a healthy locality and guarded against all catarrhal affections. If the child has "mouth breathing," any adenoid vegetation of the naso-pharnyx, or nasal passages, should be removed. The child should be clothed in all-wool underwear and kept in the open air as much as possible. Frequent bathing with

soap and water is injurious, but cool rapid sponging of the chest and neck is beneficial. If the skin is dry and rough, the child should be rubbed all over with oil twice a week. The feeding should be regular, and consist mainly of Pasteurized milk, cream, butter, and bacon — to the exclusion of sugar, candy, cake, and all delicacies of an indigestible nature. Such children have a decided aversion to all fat, as fat; but it can be put into many articles of food, and made attractive and palatable. Butter nearly all children will take, on potatoes, bread, and in various forms. In my experience very few dislike well-cured and well-cooked bacon.

As tuberculous poisons pervade the sputum and many other excretions, all these emanating from such patients should be disinfected or destroyed as soon as possible. The sputum should be expectorated on cloths and burned, or into portable spit-cups, many kinds of which are now for sale by all druggists. There should be no spitting on the floor. All handkerchiefs should be boiled before the sputum on them becomes dry; all sheets and underclothing in contact with the skin should be frequently changed and boiled, as the sweat of consumption has been found to contain bacilli. The body should be washed every day with hot water containing creoline, lysol, or some bacillicide. No one should kiss a consumptive, especially on the lips — there is danger in such contact.

Regarding the natural or spontaneous cure of phthisis, Osler makes the following assertion: "The spontaneous healing of local tuberculosis is an every-day affair. Many cases of adenitis and diseases of the bones or of the joints terminate favorably without the aid of medicines. The healing of pulmonary tuberculosis is shown, clinically, by the recovery of patients in whose sputum elastic tissue and bacilli have been found; anatomically by the presence of lesions in all stages of repair. In the granulation products and associated pneumonia a scar-tissue is formed, while the small caseous areas become impregnated with lime-salts. To such condition alone should the term healing be applied."

We may ask, in view of these facts, why cannot we find some way to imitate Nature's cures?

Medicinal Treatment.—Almost every known drug of great power has been recommended, but, tried, has failed to cure tuberculosis of the lungs. The enumeration of half of them would fill pages of this

book. One of the most astounding things connected with these medicines is their rapid rise in favor, and their rapid fall. It is a puzzle why eminent medical savants, after using a particular drug for a short period, burst out in fulsome encomiums, lauding its curative powers, when after a few months or years they themselves are the first to discard them. This has been the history of the use of arsenic, iodine, iodoform, eucalyptus, tannin, hypophosphate, cod-liver oil, mineral oils, gold, manganese, creosote, etc.

Of all these drugs creosote still holds its own against the rest, in the old school. Some very favorable reports have appeared during the last few years. In many cases there were apparent cures. In many great improvement. How many veritable cures have been made is not known. In 101 cases under the care of Meredith Reese in Osler's clinic its chief action was on the cough and expectoration, but the remedy according to Osler "had no essential influence on the disease." Many reports in the "Medical Record" and other journals of this country and Europe are more favorable, but the time for trustworthy data has not yet arrived. I have used it in ten undoubted cases of tuberculosis phthisis, in which it lessened the sputum and the fever, but did not cure in a single case. I gave it as recommended by old-school authorities, beginning with one drop three times a day, increasing a drop each day until ten drops were given three times a day. I have also tried the dilutions from the 1x to 8x, but the smaller the dose the less improvement was perceptible. It doubtless acts by passing into the circulation, and is transported through the lungs, as are the volatile oils (oleo-resins?), iodine, etc. The "Shurley-Gibbes" treatment with gold and iodine aroused at one time a good deal of hope, but it has not sustained its early promise, and will soon drop into obscurity. The later "gold and manganese" treatment will share the same fate along with the Bergeon's and Koch's method. The subsidence of Koch's tuberculin is one of the saddest episodes in the history of therapeutics.

At one time it was reported that if consumptive patients inhale a microbe which was so inimical to the bacilli that it would destroy them, the said microbe, being a harmless one, would remain without injury; meanwhile the patient is cured. Another physician treated his consumptive patients by causing them to inhale air at a temperature

of 150° F., the air at that temperature being found destructive to the bacilli. Then it was proposed to have patients inhale bacillicides, such as the mercuric chloride, creosote, carbolic acid, etc., but it was found that these inhalations were more dangerous to the patient than to the bacilli. The oxygen treatment and the pneumatic cabinet have also had their day.

Homeopathic Treatment.—In 1859 Dr. William Hitchman wrote a little treatise on Consumption. It was very readable, and the clinical reports showed that several of our medicines, notably stannum, lycopodium, kali carb., zincum, sulphur, etc., had cured cough with quite serious pulmonic symptoms. But a careful examination of the cases showed that true pulmonary tuberculosis was not among them. Great stress was laid upon the cures of stannum, but the disease cured by that remedy would now be called purulent bronchitis. The cures by kali carb. were cases of bronchitis with intercostal myalgia; those by lycopodium were cases of chronic pneumonia. From time to time reports of cures of consumption have appeared in our journals, but no testimony was presented showing that the cases were due to tuberculosis. Many of the reports were cases that were sent to some salubrious climatic resorts, while they were taking the medicines prescribed. Such reports are worthless, as no credit was given to the climate which probably was the curative agent.

In 1890 Dr. W. H. Burt wrote a work on "Tuberculosis, or Pulmonary Consumption: Prophylaxis and Cure by Sur-Alimentation of Liquid Food." An examination of the book shows that the collected data extended over a brief period only, and that the number of cases is insufficient to prove the value of the treatment. It is not denied that sur-alimentation is a potent factor in the prevention and cure, but it requires a larger experience to place it upon a scientific basis.

Dr. Burt's book is a store-house of suggestions relating to diet. He enumerates all the foods and beverages which are likely to be of benefit to the consumptive, and a great many of doubtful value. He insists mainly on a fluid or semi-fluid diet, and that food should be taken frequently. He truthfully says that the diet of consumptives should be just the opposite of that recommended for corpulence. I agree with him, except that both should eat pure animal and vegetable fats. His indications for medicinal remedies are excellent,

and in some respects better than those given by Dr. H. C. Allen, with which they should be compared.

In 1892 was published a posthumous work written by Dr. Gregg, edited by Dr. H. C. Allen. The publication of Dr. Gregg's theories under the sanction of a prominent member of our school is very unfortunate. Although the theories are accepted by very few, the whole homeopathic school will be saddled with it. The theories are so grotesque, and so at variance with the facts now established and accepted by the whole scientific medical world, that it is a source of humiliation to us. Had Dr. Allen left Gregg's theories out, and called the book "Indications for the use of palliative remedies in Consumption," the work would have had a lasting popularity, and redounded to his credit. Dr. Gregg opens his work with the following startling announcement: "Having finally secured the last link in the long chain of positive as well as negative proof to clear up the mystery which has so long hung over the cause and nature of tubercle, I am now prepared to re-affirm even more positively than ever before that the cause of consumption is a loss of albumen from the blood through irritated and abraded mucous membranes."

He cites Bright's disease as proof. Further on he says: "The blood corpuscles left in excess are decolorized by circulating in the too watery blood or serum, notwithstanding the night-sweats, and dropsy throws off a large portion of the excess of water, and these decolorized corpuscles are then deposited in the capillaries, where they shrivel to become the so-called tuberculous corpuscles which are organized into tubercles and which have no other origin but this." In another place he denies the existence of the tubercle bacillus, and declares that the objects so called are nothing else than "short sections of threads of fibrin broken up under the slow rotting of the tubercle." To support this he brings forward many subtle and ingenious arguments, which seem to the unscientific ample proof, and which I shall not attempt to controvert.

His treatment is this: If we can arrest the flow of albumin from mucous surfaces we can cure consumption. The second part of the book is written by Dr. H. C. Allen, who, after giving excellent rules relating to hygiene, diet, and climatics, gives indications for nearly all the remedies in our materia medica, one hundred and seventy; not one of which has ever cured a case of consumption. They are all pal-

liatives, useful when indicated, but have no actual curative power over this dread disease. The Repertory is well written, and is a work showing great and patient labor. The whole book is a monument of misdirected industry, interesting, even fascinating, but based on fallacious theories, and, except as relates to the cure by diet and climate, is unpractical and valueless. I do not desire to place myself on record as denying the possibility of curing pulmonary tuberculosis with medicines, but I do deny the probability of cures made without changing the hygienic and climatic surroundings of the patient. I also assert that a favorable change in the environment of the patient, especially in the incipient and early stages, will cure more than any other agency.

The Climate for Consumptives. No one climate will suit all cases. It is not pure air, sunshine, altitude, equal temperature, cold, or heat alone that makes a climate for consumptives, but a careful blending of a part of these conditions. A climate and locality that will arrest the disease in one, will hasten its progress in another. Before sending a patient with pulmonary tuberculosis to any climate he should be told that if the locality selected does not cause improvement in a reasonable time, another and different one should be visited. The advice of Dr. B. W. James in his "American Resorts and Climates" is so pertinent and good that I quote it. He says:

"When a sufferer from phthisis has found a climate suitable for his individual case, and repaired to it, he should remain, if not permanently, which is the best plan as a rule, at least until his health is well established, and after leaving, should he notice a return of his lung difficulty, go back at once to the favorable climatic conditions. If this desirable climate is prescribed by his attending physician the prescription should be accompanied by a letter of introduction to a reliable physician at the place of resort, which communication should contain information in regard to the patient, the history of his malady, past treatment, and other guiding-points in the case. From considerable observation we are persuaded that as a rule cases of pulmonary phthisis that have reached the last stage of the disease, reap longer life, enjoy more comfort, obtain more kindly care, and suffer less, by a continuance at their home, if it be a comfortable one, than they do by a residence at an invalid resort, no matter how near at hand the locality may be. Not infrequently, where a

number of such cases are stopping at the same hotel, they will greatly annoy each other; disturbing their rest at night by coughing, and add to each other's discomfort during the day by gloomy and depressing conversation."

Dr. James further says it is his experience that "In the majority of cases a dry climate is desirable, and as a rule one not having a very high range of atmospheric temperatures; to these conditions may be added (for the patient not suffering from hemoptysis or feeble heart) that lessened barometric pressure obtainable in high latitudes. In short, we believe that a pure, clear, dry, cool, rarified atmosphere is desirable for most phthisical cases."

There are many cases of phthisis and other pulmonary disorders that do not do as well in a cool climate, even if it is dry, and in a damp climate they are not only uncomfortable, but are made worse by it. Such cases do well in a warm dry climate, in which they experience less discomfort, and rapidly improve. This I have verified in several patients who went to California and got worse while on the coast, but when they changed to the eastern slope, to Banning, immediately improved. I recall one case, a young married woman of this city, who had intestinal and pulmonary tuberculosis. She grew rapidly worse at Los Angeles and Santa Barbara, but at Banning she improved rapidly. She remained there two years, when the heat seemed to debilitate her. She removed to El Paso, Texas, where she improved for several months, when an arrest of improvement caused her to go to San Antonio, where she was greatly benefitted during the winter, but in the spring the heat affected her so unpleasantly that she went to Colorado Springs, where she now is. She writes me that she has fully recovered. Allow me to say that even now I doubt the propriety of her return to Chicago.

Very few cases continue to improve many years after their return. Sooner or later the latent tuberculosis manifests itself. I recall a case that came under my observation in Florida. Colonel B—— came to Enterprise from northern New York, in the suppurative stage of phthisis, nearly twenty years ago. During his first winter he improved so notably that he purchased an orange grove on the shore of Lake Monroe, where he lived in comfortable health until 1891. He had occasionally spent three months in the summer at his Northern home, but always hurried back to Florida before October. On his last

visit he remained six months in the North; too long for safety, for his cough, expectoration, and hectic returned in September, and he died in November, before he could reach Florida. This is but one example in thousands which illustrate that if patients go to a climate which arrests the disease, they should remain there. There is no safety in returning to their Northern homes. One reason why consumptives should never return to their Northern homes is mentioned by Dr. R. Thorne in "Sajous' Annual." He says: "A house in which the disease has existed remains a centre of infection for an indefinite time." The western slope of California has been greatly overrated as a resort for consumption, or for any chronic bronchial or pulmonary disease. Only in the extreme southern and southeastern part do we find the climatic conditions favorable; but these localities are almost unpopulated, and patients cannot be made physically comfortable there. Take it all in all, probably the section of country possessing the most beneficial climate west of the Mississippi for consumptives generally is what Dr. Littlejohn calls the Rocky Mountain Region. This he defines as follows: "The elevated section of country amid and on the sides of the Rocky Mountains extending from El Paso, Texas, or the Southern line of New Mexico, north through the whole of New Mexico, Colorado, and into Wyoming." Dr. Littlejohn, himself an invalid, travelled all through that region, and noted its effects on hundreds of phthisical persons. I should include Arizona, which I believe will in time, when settled, be the chief sanitarium for consumptives in the West. Dr. E. J. Clark, of Denver, writing of the causes of phthisis, says: "Tuberculosis is produced primarily by a process of malnutrition and consequent lack of energy of the organs of circulation and excretion." Dr. Richard Hughes has well said: "Certainly the most important medicines for tuberculosis are those which influence the assimilative process. Therefore, as malnutrition must be overcome, the question of assimilation, even from a climatological standpoint, becomes one of great importance. Healthy persons, and most invalids who have a moderate amount of energy, at elevations of less than 6,500 feet find an increase in the appetite for food. Some of the feebler class, especially those who habitually have a better appetite for food in warm than in cold weather, find a diminution in appetite on first going to elevated regions when only an altitude of 4,000 or 5,000 feet is reached.

This loss may be only temporary or it may be persistent. How often I hear patients say, 'I cannot get enough sleep or enough to eat.' When I hear this, I know that the patient is gaining. An improvement in the general nutrition of the body and in the quality of the blood is usually produced by mountain climates, and nervous and muscular energy are increased. It would only be natural that, in a bright and dry and light atmosphere, with nature rejoicing in the cheerfulness of a healthy climate, that not only the heart's action and respiration should be increased, but that, the blood flowing free through the entire body, no stagnant pools anywhere, and tinged with the bright and rich color that only the God-given sunshine can give it, the whole body should rejoice and assimilation take a stride forward. In a climate filled with moisture, the density of the air weighing down the system, clouds hiding the light of the sun and gloominess and moisture predominating, should we be surprised that the body should be also sad and assimilation falling away?" *

The next important region is what might be called the Alleghany Region, which includes the sections amid and on both sides of the Alleghanies, preferably the western slope, from Ashville, N. C., through South Carolina and Georgia. The third region, which is principally for residence during the summer, is the Adirondac Region, and the high lands around Lake Superior and in Montana. Even in winter, patients may do as well in these regions as in Davos and the Engadine in Europe, and there are places in Yellowstone

* Dr. Clark makes the following comparison, which places Colorado among the best of climates:

Model Climate.	Colorado Climate.
1. Elevation.	1. Elevation.
2. A large amount of sunshine.	2. A large amount of sunshine.
3. Dry air.	3. Dry air.
	4. A warm sun temperature.
5. Variability of temperature.	5. A somewhat variable temperature; cool not cold in mid-winter; cold during a winter's night, but comfortable at mid-day.
6. Moderate winds.	6. Moderate motion of the air, with occasional high winds.
	7. A small snow and rainfall.
8. Brightness of the atmosphere.	8. The absence of fogs.
9. Pure, aseptic air.	9. A pure air.
10. A dry soil.	10. A dry, sandy, well-drained soil.

Park which possess a climate in winter that rival them for dryness and coldness. Dr. Doran, an English scientist, insists that the day will come when all these resorts will be abandoned on account of the presence of bacilli, and that then the arctic regions will become the only safe resort.

Dr. B. W. James mentions Florida, and says its mild and moist climate is soft and sedative, and useful where there is considerable inflammation and dry cough, etc. He mentions Jacksonville, Fernandina, and St. Augustine, as the "most popular." This popularity, however, is confined to tourists, but these places are the worst in all Florida for phthisis and nearly all pulmonary diseases. In the following paper read before the American Health Association, I reported what I believe gives a true estimate of the climates of Florida:

"It will be observed that I use the plural in speaking of the climate of Florida. I do this because it is as improper to speak of the *climate* of that state as it would be to speak of the climate of the United States.

When the physician sends a patient to Florida for his or her health, and does not specify the part of the state his patient ought to go, he shows a lamentable ignorance of that state, for Florida has several distinct climates, and that portion of the state which is good for one patient may be injurious to another. It is the general belief among the laity, and most of the medical profession, that the whole of the state of Florida is low, damp, and *malarious*. Now this is not true. It only applies to one or two sections of the state, as I shall try to show you on the outline map which I place before you. You will observe that I have divided the state horizontally into three divisions, namely:

Upper Florida, reaching from 31 degrees to 29 1-2 degrees of latitude,

Middle Florida, from 29 1-2 degrees to 27 1-2 degrees, and

Lower Florida, from 27 1-2 degrees to 25 degrees, or nearly to Key West.

Now when I tell you that each of the above divisions represents a quite different climate you need not be surprised.

Upper Florida is like Georgia and Alabama, where frosts and snows are not infrequent, and cold northwestern and eastern winds

in winter are quite trying to any invalid. The fruits of this region are different from the other divisions. There is no doubt that every decade or century the whole upper half of Florida is growing colder. Oranges, lemons, bananas, and figs once grew as far north as Charleston, S. C., and St. Augustine was once the centre of the orange-growing region. Now the orange is a failure north of Jacksonville, and an uncertain crop in the latitude of St. Augustine and Cedar Keys.

But in this region the pear, peach, grape, and plum grow and reach their greatest perfection. The mean temperature of this region in winter is 60° and in summer 80°. Now it is evident that we cannot send all patients to this climate in winter. Those who are troubled with rheumatism, pulmonary disorders, catarrh, and bronchitis do not do well here. The change in temperature from noon till evening is great, and the sudden coolness that comes with the dark is dangerous to patients with sensitive lungs, unless they take excellent precaution and keep in-doors, in a temperature as nearly that of the day as is possible. In this region a fire in the stove or fireplace in the evening is indispensable from the first of November until the first of April, and during the prevalence of "northers" patients should not stay out-of-doors.

In Middle Florida the mean temperature in winter is 70°; in summer, 80° to 85°. The northers are not as severe, especially inland, and the nights are warmer, but the same precautions should be taken during the winter months, for the fall in temperature from 5 to 9 o'clock P. M. is often 10°. Often in winter the heat of the sun from 10 A. M. to 3 P. M. is intense. I mean the *direct* rays of the sun, for if you are in the shade of a tree, or under an umbrella or a piazza, you do not feel the heat. Many patients catch cold in Florida from ignorance of this fact. They walk in the sun and get heated and perspiring, sit down in the shade, and soon find they feel chilly, and the result is an illness. This climatic peculiarity is not confined to Florida, but belongs to Mexico, California, New Mexico, Spain, Italy, and even Algeria. I think in no part of the world did I feel the evening change so unpleasantly as in California on the Pacific slope. In Cuba and Jamaica and the Bermudas the change at night is not so abrupt and very much less. In Cuba in January and March it is scarcely felt, the thermometer not dropping more

than 4° at night. Not all of middle Florida has this sudden cool change in the evening, for there is a portion on the Gulf coast that is more even in temperature, because there is less average humidity in the air; but I shall refer to this further on. This middle Florida is the orange-belt, where that fruit grows to perfection. It reaches from Palatka to Charlotte Harbor. The lemon, lime, and grape-fruit grows in this region, particularly below the 28th degree of latitude; above that it is sometimes injured by frosts, for they are more sensitive to frosts than the orange. The grape does well in this region, and the prospects are that certain portions of it will become a profitable wine-producing country. Below the 28th, peaches, pears, and plums do not grow as well, and their cultivation is unprofitable. But the fig, guava, and pomegranate are successfully grown. In the drier portions of middle Florida nearly all patients with catarrhal troubles, bronchial and pulmonary disorders, rheumatism, neuralgia, and Bright's disease are very much benefited in winter, and also in autumn, summer, and spring; but at all times of the year they should avoid the low lands, the borders of rivers unless high, and the swampy sea and gulf coast.

Lower Florida is essentially tropical, nearly as much so as the West Indies. The winters are warm and delightful. The heat in the middle of the day sometimes reaches 85° or 90°, but the nights are not as cool as further north, rarely cooler than 70°. Consumptives will find the Atlantic coast from Rockledge to Bisayone Bay, and the gulf coast from Tarpon Springs to Ft. Myers and beyond, a climate in winter which is as near perfect as any found in the United States. Some consumptives will find the interior of the state to agree with them better, but such location is difficult of access now, except along the line of railroad from Sanford to Tampa. In this favored region is the paradise for neuræsthenics; for nerveless and nervous men and women, broken down in mind and body from the intense strain of business and social demands in our Northern states. The soft languorous air lulls them to sleep at night, and soothes them by day.

There is no region of the United States that can compare with this, unless it be some quiet, warm valleys, low lying on the eastern slopes of California, Arizona, or New Mexico. In the regions above named most of the semi-tropical fruits grow. The pineapple,

cocoanut, paw paw, cherimoya, grape-fruit, bananas, and many others found in the West Indies and Central America, can be successfully cultivated. Injurious frosts do not occur in this region more than two or three times in a century.

Northern people have an idea that the whole of Florida is malarious; this is an error. Florida is no more malarious than many Northern states,— in fact, not as malarious as Missouri, New Jersey, or Connecticut; and where it is malarious the type of fever is not as severe as in the above states. In the winter, from November to May, there is no swamp malaria at all. Tourists and winter visitors often contract a disorder which they think malaria, but it is not. It is the result of two causes, namely, exposure to night air and to the bad sewerage of some Florida hotels. Many of the hotels in Florida are wooden structures, put up in a hurried manner, and with but little regard to hygienic principles. The same may be said of many of the hotels in California and all other parts of the United States. Improper eating and drinking at these hotels is a common cause of the so-called malarious fevers.

When you send patients to Florida, tell them to avoid the margin of these rivers; to avoid exposure to sudden changes of temperature, and all excesses in eating and drinking, or residing in low, damp houses. In studying the topography of Florida, there will be found an elevation composed of pine lands, called high rolling pine lands, midway between the St. Johns River and the Atlantic coast. This land is elevated thirty to forty feet above the river and the Atlantic. On the western side of the St. Johns River, midway between the river and the Gulf, is a prolongation of the Alleghanies, extending almost down to Tampa, and at places nearly to the Gulf. This "ridge" is elevated in some places two hundred and often four hundred feet above the sea. It is on these ridges, on both sides of the St. Johns, that patients of all kinds should go on account of the dryness of the air, the influence of the pine forests, and better facilities for house and village drainage.

On examination of the War Department weather maps, you will see that the humidity of Florida is the same as the whole Atlantic coast as far north as Maine. But the humidity or dampness of an atmosphere is greatly modified by sunshine. Now the weather maps show that the mean cloudiness in Florida in winter is about the same

as California, which makes the dampness of the atmosphere relatively less than any other part of the United States, except California, New Mexico, and Arizona.

A curious feature of the climate of Florida is that the most sunny portion of Florida is on the west coast. That area is represented by a segment of a circle bending eastward, and reaching from Tarpon Springs to Charlotte Harbor. This area is as dry as the California coast. But, admitting that Florida is not as dry as the Pacific coast, it is no objection to that state. Dryness of the air is not always a *desideratum* in disease, as anyone who has sent patients to the dry regions West can testify. Sunshine is of more importance than dryness in consumption and in all nervous diseases. It is an indisputable fact that a dry climate is not always favorable to recovery in cases of consumption and all diseases characterized by nervous eretheism and pain. Excessive dryness aggravates neuræsthenia, chorea, neuralgia, and similar disorders. Some cases of rheumatism, bronchitis, and phthisis do better in a moderately damp climate, provided there is abundance of sunshine.

Dr. Dennison does injustice in his map of relative dryness, when he gives Jacksonville, Fla., as representing Florida. The fact is that Jacksonville is the dampest place in the state, except Pensacola. St. Augustine, Deland, Enterprise, Tarpon Springs, and Tampa are all drier than that city.

I will make one more observation, and that is relating to Florida as a sanitarium for children. For many years I have sent infants and children to that state in the winter, and have not in a single case had cause to regret it. Our Northern winters are very injurious to delicate children. They suffer with catarrhal affections, not only of the air-passages but of the intestinal tract. They have croup, bronchitis, tonsillitis, indigestion, diarrhœa, and all the disorders arising from intestinal and gastric catarrh. They become so sensitive to cold and dampness that they are deprived of sunshine and open air. They grow pale, emaciated, feverish, and fretful. If you send such children to the high lands of Florida, or its sea and gulf coasts, you will be surprised at the rapid improvement. In a few weeks they will be able to stay out-of-doors all day, and eat almost anything with impunity. They should not be allowed to return North before the month of May. If they begin to feel unpleasantly

the warmth of April,— which they rarely do,— they should return north as far as Aiken, S. C., or Hot Springs, N. C.

In this brief paper I have given you the results of my experience and observation of ten years. I shall be gratified if I have given you a better estimate of the climates of Florida.

How to get to Florida winter resorts.— If the invalid from any Northern state wants to go to some place in Florida, he must first go to Jacksonville, unless he starts from a Northwestern state, in which case he goes to Mobile or Pensacola or Tallahassee. If he desires to go down the east coast, beyond St. Augustine, he takes a river steamer on the St. Johns, goes to Sanford, and thence to Titusville on the Indian River. The most salubrious places on the east coast are St. Augustine, Daytona, Rockledge, Merritt's Island, Melbourne Beach, and Lake Worth, which is as far as an invalid can go. The four latter places should be visited in December, January, and February. In March and April they are too warm for some patients, who feel better in Daytona and St. Augustine. Inland, the best resorts are Enterprise, Winter Park, and Orlando, which are reached by the railroad from Sanford. Children are very favorably influenced by the sea-air on the coast, at the places I have named.

The best resorts on the west coast are Tarpon Springs, Sunderland (which Dr. W. C. Richardson, of St. Louis, considers the most healthful), Tampa, Pine Island (a lovely place, with a shore strewn with sea-shells), and Ft. Myers (which should not be visited after March 1). If we send patients from the North for a radical change in climate, and if they need warm, sunny days all the time, start them off in December, and tell them not to stop till they have reached Rockledge on the east, or Tampa on the west, and remain there or beyond until March 1. Then move northward to Sunderland, Gainesville, St. Augustine, or Tallahassee, and in April to Thomasville or Aiken, contiguous resorts. The inland places on the west side of the St. Johns River are Gainesville, Ocala, Leesburg, or any other point where the land is high rolling pine. Invalids cannot depend on the advice of local physicians, who cannot help being selfish; it is human nature. The best judges are impartial observers, with no local interests."

Before leaving the subject of Climate I will present the views of Dr. Charles Dennison of Denver, whose investigations of this subject

makes him our most competent authority. In a recent paper on "The Most Preferable Climate in Consumption," he claims to deduce from clinical evidence, that the following conditions are the best to arrest chronic pulmonary disease:

1. Dryness as opposed to moisture.
2. Coolness or cold preferable to warmth or heat.
3. Rarefaction as opposed to sea-level pressure.
4. Sunshine as opposed to cloudiness.
5. Variability of temperature as opposed to equability.
6. Marked diathermancy of the air to be preferred to the smoky atmosphere of cities or the dense air strata of moist currents.
7. Radiation and absorption of heat by rocks and sandy loams better than latent absorption by water and damp clay soils.
8. Mountainous configuration of country (quick drainage) contrasted with the flatness, etc., of level sections.
9. Frequent electrical changes of atmosphere, also moderate winds (except in quite cold weather), preferable to continuous stillness of the air.
10. Inland altitudes contrasted with sea air (total absence of land influence); but in certain cases sea voyages and island resorts to be preferred as compromise substitutes for high altitudes.

Dr. Dennison makes a good argument in favor of his preference, and I advise all physicians to study his valuable paper.

One of his arguments in favor of cold, namely, that the bacilli cease to grow at a temperature below 82° F., seems undemonstrable, since the mean temperature of the New England States, where the percentage of consumption is greatest, falls below that point. The fact is, and Dr. Dennison is probably aware of it, that all the favorable conditions should be combined to make a perfect climate. But suppose all these conditions are combined, the matter of soil as a factor should not be forgotten. Many high regions possess nearly all Dr. Dennison's favorable conditions except soil. I have found that the Alleghanies north of Asheville, N. C., possess a damp clay soil. I suppose there are portions even of the Rocky Mountains where the soil is damp. It is no unusual thing to find marshy spots on the sides or tops of the highest mountains. But of course Dr. Dennison would not advise such localities. This leads me to suggest that possibly Dr. Dennison is not aware how nearly certain parts of Florida come to his ideal soil, which is "a dry sandy loam, with rapid absorption of air, vapor, and radiation of heat." This is the kind of soil which abounds in middle Florida, *i. e.*, from Palatka to Tampa, midway between the St. Johns River and the Atlantic on one side and the

Gulf on the other. These sections are fifty to one hundred feet above the sea level, and the soil is almost pure sand, and from ten to twenty feet deep, lying upon clay. The porosity of this soil is unequaled, and its radiating power immense. The heaviest rains, lasting for days, leave the soil wet for only a few hours, the moisture being rapidly drained and radiated. The mean temperature of this portion of Florida from November 1 to April 1 is below 70° (when the bacilli, according to Koch, do not thrive). The humidity of the air in this region is less than that of any other part of Florida. During these months in the winter of 1891 there were but 15 cloudy days out of the 121. On these high sandy hills the air is as clear and pure and as laden with balsamic odors as any place in the United States. Dr. Dennison gives the following as contra-indications or "general reasons why a given invalid should not go to an otherwise high climate," and those are the patients who should go to the region in Florida above mentioned. Dennison's contra-indications are:

1. The coldest season of the year, intensifying the effect of altitude too much for those coming from warmer climes.

2. Advanced age of the individual, rendering acclimatization difficult; senile phthisis; and those who are too old and feeble to exercise out-of-doors.

3. A very excitable, nervous temperament, aggravating the stimulation of climate, producing irritability and sometimes wakefulness. "Erethric phthisis."

4. Some women, for a like susceptibility, and less adaptability to the change and to out-door life than men.

5. Valvular lesions, with rapid action of the heart, especially with the previous exceptions. Diseases of the great vessels, such as aneurism.

6. Marked and extensive emphysema, pneumothorax, and hydro-pneumothorax.

7. Active pneumonia or existing hæmoptysis. If the pneumonia or hemorrhage is recent, the contra-indication amounts to little; if remote, to nothing. If there is reason for some doubt, in any such otherwise favorable case, a gradual rise in elevation should be chosen.

8. High bodily temperature, whether it be rather constant, as in some inflammatory states, or in catarrhal extension beyond a tubercular zone, or whether it be regularly vacillating, as in a tubercular infection, *i. e.*, daily low or subnormal in morning, and up to 103° or more later in the day, especially with suspicious laryngeal complication, or in so-called "catarrhal phthisis."

9. Extensive involvement of lung tissue in diseased action, *i. e.*, so that the healthy spirometrical record is more than one-half abridged. Of course advanced stage of disease renders this contra-indication much stronger. Dr. C. Theodore Williams, in his "Treatment of Pulmonary Consumption by Residence at High Altitudes," expresses this contra-indication as follows: "Phthisis with double cavities, with or without pyrexia; cases of phthisis when the pulmonary area at low levels hardly suffices for respiratory purposes."

10. The stage of softening, if accompanied by high daily fever, or in one of decided hemorrhagic diathesis. "Quick consumption," with or without intestinal ulceration or albuminuria.

"Allowing patients to go to Colorado, which many physicians have done, as a *dernier ressort*, when they have not a five per cent chance of living six months anywhere, needs our strong condemnation.

"It must always be remembered that every rule has its exceptions, and that contra-indications may be neutralized by favorable circumstances, such as the best time of the year for the change, previous experience of the individual in high climates, and the association of opposite conditions in the same patient. For instance, the writer has in mind an excitable lady with aortic insufficiency, neurasthenia, and some fibroid lung, who has done excellently well in Colorado. Another case of asthma and enlargement of the heart, with mitral regurgitation, was free from asthma while he remained, and was very little troubled with his valvular lesion."

Dr. R. Thorne directs attention to the dwelling-house in relation to tuberculous consumption. He shows that no matter in what climate or location the home is made, the character of the house and its environments is an important feature.

Conditions of Dwelling-house tending to the Promotion of Tuberculous Consumption.	*Conditions of Dwelling-house tending to the Prevention of Tuberculous Consumption.*
1. A soil either (a) naturally damp and cold; or (b) subject to the influence of the rise and fall of a subsoil water lying within a few feet of the surface.	1. A soil which is (a) dry naturally; or (b) freed by artificial means from the injurious influence of dampness, and of the oscillations of the underlying subsoil water.
2. A dwelling-house of which either the foundations, the area they enclose, or the walls, are, by reason of faulty construction or otherwise, liable to dampness.	2. A dwelling-house so constructed as to be protected against dampness of site, foundations, and walls.
3. Such immediate surroundings of the dwelling-house as tend to prevent the free movement of air about it, and its ample exposure to the influence of sunlight.	3. Such open space on at least two opposite sides of the dwelling-house as shall secure ample movement of air about it, together with its free exposure to the influence of sunlight.
4. Such structural defects as would prevent the maintenance within all parts of the dwelling-house of ample movement of air by day and by night, and free exposure of its habitable rooms to daylight.	4. Such construction of dwelling-house as will secure for its habitable rooms and throughout its interior free movement of air by day and by night, and the free access of daylight.

The frequent occurrence of phthisis in numerous members of the same family living in the same house, and sometimes in individuals of different families occupying the same house, either together or in succession, strongly suggests the idea that the house rather than heredity is responsible, that it is the contagious virus in the house itself retaining its vitality for long periods (possibly aided by the transmission of an inherited tendency), which is really the cause of the disease.

Now that we are beginning to believe in the specific nature of phthisis, we find that the evidence of contagion rapidly accumulates, and the necessity for disinfecting agencies of a thorough and penetrating kind as applied to houses is becoming daily more apparent, inasmuch as "a house in which the disease has existed remains a centre of infection for an indefinite time."

It is rather rashly advised by many authorities that the patient should live out-of-doors in all weather, and exercise as much as possible. If this advice is not qualified it will lead to grave consequences. Undue and unnecessary exposure to rain, dampness, heat, etc., is injurious anywhere, and in all diseases. The patient should avoid these, but remain out-of-doors when the air is dry and warm or dry and cold, or even warm and moist, if the sun is shining; being out in a warm rain is not injurious if the patient is clad in such a manner as to keep the whole body dry. As to exercise, I agree with the earnest advice of Dr. Karl von Ruck, of Ashville, N. C., whose large experience enables him to speak with authority. He has done good service in directing attention to the detrimental effects of over-exertion in pulmonary phthisis. "It is truly pitiful to see such patients literally drag themselves about, exhausting what little strength and recuperative power they still possess; and more so yet to see how, under the mistaken association of exercise with the necessary out-door life, their wasting becomes more evident from day to day, their steps less secure, their frames more stooping, their stopping 'to catch breath' more frequent, and the hectic flush more distinct upon their sunken cheeks, until, finally, from utter exhaustion, or from resulting collapses and complications, they are obliged to keep to their house and room. But even here they resort to in-door gymnastics, swinging dumb bells or Indian clubs, or box against an imagined foe in the shape of a suspended and inflated rub-

ber air-bag or other contrivance calculated to offer resistence to their self-exhausting blows. Such sights are not uncommon in advanced cases, and the picture is only less painful in cases of the early stage, because there is still a relative appearance of well-being; but, so long as they tax their strength to the utmost in violent exertions, the advanced stage is reached surely and steadily, although the pace may appear less rapid."

The homeopathic treatment of phthisis, as I have before intimated, does not show any absolute curative results superior to that of the old school. If two patients of equal physical conditions were placed under the most approved treatment, one under the homeopathic, the other under the regular, with the same environment, I doubt if the result would be different. But here the comparison ends, for the palliative treatment of the homeopathic school is infinitely superior. Painful and unpleasant symptoms are better palliated when treated according to the law of similia. In the last stage no treatment is equal to it in "smoothing the pathway to the grave."

A wide and perhaps profitable field for speculation was opened by Dr. Mays when he published his views as to the nervous origin of phthisis. He contends that if we seek to prevent that disease, we must act through the nervous system, increasing its power, and consequently the nutrition of the organs diseased. Brown-Sequard, in a recent meeting of the Acadamie des Sciences, seems to adopt the same views. He announced that Dr. Arsonval and himself had treated eighty-three tuberculous patients with injections of "tubercular fluid," filtered and sterilized; of these, seventy-four were cured and only nine died.

"Not only did the morbid reflexes, causes by the pulmonary irritation and determining the formation of the tuberculous neoplasm, disappear, but the improvement of the nutrition produced by the action of the medicament permitted the organism to become master over the morbid process." He claims that the bacilli are only "a secondary agent in tuberculosis," and that any treatment aimed directly against them is inefficacious. Dr. J. C. Burnett, in his monograph on "The Treatment of Consumption by the Attenuated Tuberculin," makes the same claims; but he does not present the same proofs of cure as does Brown-Sequard. He only presents cases that were ameliorated,

or where the disease was apparently arrested. This is the theory which our school should adopt, instead of the absolute psora theory of Hahnemann. It may be that the metallic neurotic medicines, like gold, iron, zinc, manganese, or vegetable medicines which contain them, and, in addition, phosphorous, iodine, sulphur, and calcaria, will be found most appropriate.

My own experience with phthisis does not encourage me to promise a cure with medicines unless I can place the patients in a suitable climate and environment. The medicines most likely to cure are arsenic, aurum, iodine, sanguinaria, enyodiction, eucalyptus, creosote, myrtol, morrhual, phosphorous, and a few others. The palliatives are all drugs which produce symptoms like those patients may have.

Diet of Consumptives.—This must be divided into two methods: (1) The diet for prevention; and (2) the diet for arrest.

I have already given the prevention diet for tuberculous children, or those disposed to that condition. The diet of adults should not much differ. The fats and oils can be given more freely for the prevention of phthisis, and in its incipient stage, than when the bacilli have actually invaded the tissues. Milk containing its proper amount of fat is an excellent food for some cases. There are patients who cannot take milk. For such I advise malted milk, with the addition of cream, and find it acceptable. Butter should be used freely on every kind of food, but it should not be heated sufficiently to injure it. Next to butter, the fat of bacon is best; it is the most digestible and assimilable of all fats, and can be substituted for butter on all starchy foods. If the patient has a good digestion, bacon or pork and beans form an excellent food. The old fancy that pork caused scrofula or tuberculosis is obsolete. If the pork is tuberculous the process of thorough cooking destroys the bacilli, and none but barbarous nations eat raw pork.

Among the recent studies on food appearing in "Merck's Bulletin," September, 1892, is a very suggestive one relating to the improper use of fats in "seated" tuberculosis of the lungs. The writer, under the heading "The Vital Error in Oily Diet," says:

"One great mistake that is commonly made in the therapeutic management of this class of cases, in which there is an inability to supply the full quotum of oxygen, is to recommend a free use of

oil, usually in the form of oleum morrhuæ, either pure or in some mixture. Under the above described conditions, all forms of oils are objectionable, by virtue of the common physiological law that the fat first reaches the blood capillaries in the lungs. At this point the system takes in its new supply of oxygen, in consequence whereof the fat becomes so rapidly oxidized or transmuted that its identity is even lost in passing through the pulmonary circuit. Naturally used, a large amount of the oxygen taken in must be used up at the very point of its entrance into the system. A large amount of heat is generated in the lungs, which, to be of general service to the economy, must first be distributed through the circulating blood to all parts of the body, and thereby is often too rapidly dissipated before it can be fully utilized to aid in the proteid metabolism. The original in-taking capacity of the system for oxygen being already limited where there is a defective nutritive condition, this sudden and increased consumption of oxygen at its very point of entrance still further cuts down the amount of oxygen that can be distributed to the liver and other organs of the body. In consequence thereof there is quickly developed by the therapeutic measures instituted a still greater lack, throughout the system, of the oxygen which is required to perfectly transmute the proteid bodies absolutely needed for the nutritive work of the system; and which might have been fully accomplished upon the buttermilk diet if the oil had been withheld, thereby avoiding this undue expenditure of oxygen in the pulmonary circuit. From the unquestionable fact that fat does not enter into the constructive metabolism of the body, but is rapidly oxidized and transmuted into heat and energy in large amounts, it does of necessity stimulate and invigorate the whole system, and particularly the nervous mechanism, which responds quickly to this form of irritation. This naturally deludes, not only the poor sufferer, but the friends, and too often the physician, with the idea that the patient is rapidly and permanently gaining; but, owing to the defective supply of oxygen to the system at large, proteid oxidation grows progressively less and less perfect, constructive metabolism grows weaker and weaker, until suddenly there is a rapid failure, and the descent toward the grave is so speedy that no human skill or earthly power can stay the downward progress. When the physiological powers have been sapped, both by the original disease

and by this false condition of oxidation, death becomes inevitable by this combined process of starvation and false stimulation."

The same writer (like our Prof. R. N. Foster) is very favorable to a diet of buttermilk. After giving its composition, namely: water 88 parts; proteid substances, 4.10; saccharine matter, 6.40; fat, .70; mineral salts, .80; he says: "Although a large portion of the fat has been removed, the remaining fluid, as compared with milk, has been concentrated so that the proteid elements and milk are increased." He advises the daily use of 102 ounces, which will give 4.19 ounces of proteid substance. "The decrease in fat, and the simultaneous rise in the percentage of milk-sugar, are two reasons why buttermilk is so valuable as a food-stuff." Of its value in pulmonary lesions he says: "Whenever there is a mechanical defect in the pulmonary organs,— as occurs in many diseases of the lungs, such as tuberculosis, pleurisy with compression of the lung, emphysema, interstitial pneumonia so-called, syphilitic and other forms of sclerosis of the lungs,— the fact that this diet will yield so large a proportion of constructive and reparative material for the small outlay of oxygen used should always be remembered, and the patient be given the benefit of it. Clinically, this plan has long been followed in an empirical manner; but, when the clinician is pressed for a logical and scientific explanation of the good results obtained, the common answer has been, 'the well-known clinical fact,' and probably that the buttermilk also possessed 'some special therapeutic properties,' while the true explanation lies in the simple physiological fact that more constructive and reparative work can be developed, with the smallest expenditure of oxygen, when exclusively confined to a buttermilk diet, than upon any other form of food-stuff thus far computed."

The "Salisbury diet," or all meat and hot water, is a singular "fad," and may be classed among the monomanias. This diet may be of great value in some disorders, as I am fully aware, but to recommend it as the diet in phthisis is so monstrous that it should not be considered for a moment. I have seen several of my patients whom I have made comfortable for years decline rapidly after adopting the diet. One of them died of uræmia, the direct result, I believe, of the exclusive use of meat.

Alcohol has its sphere of beneficial action in phthisis, but that sphere is very limited. In large quantities, continued for a con-

siderable time, it acts like the improper and excessive use of fat, before mentioned. It should never be taken with cod-liver oil. I know this is counter to the usual practice, but I am sure my experience has taught me its bad effects when given with oil. It may be taken with buttermilk, or milk not rich in fat. Only the purest wine or whisky should be used, and then in moderate quantities, not exceeding half an ounce or one ounce of alcohol per diem. Alcohol has no preventive or curative action in tuberculosis. Small quantities of pure spirits relieve the "sinking" and "depression" that comes from lack of food, when the patient cannot eat enough to supply the demand. It should be taken after meals, never before.

GONORRHŒA.

Definition.— Of this disease I can say about the same that I said of syphilis: it is a unit, not an assemblage of diseases; it is caused by a specific germ, the "gonococcus"; it may not cause the same symptoms in all persons, its manifestations varying with the susceptibilities and the constitution of the patient; but all the time it is one disease only.

Hahnemann must have had an inkling of the true nature of gonorrhœa, for he calls the cause of the disease a "germ" (see his Lesser Writings). He scouts the idea that there is any danger in arresting the discharge, for he says, "if we can arrest the discharge, we can do so only by destroying the germ." How different is the teaching of some of his alleged followers of the present day! I do not say that Hahnemann was correct in this assertion, for there seems to be proof that if the discharge is arrested by astringents the gonococci are driven into the circulation, and cause trouble in contiguous and sometimes remote localities. I have seen orchitis and gonorrhœal rheumatism follow the arrest of the urethral discharge by zinc.; and I have seen ovaritis and salpingitis follow the use of astringent lotions to the vagina. I have also seen these local inflammations subside when the discharge from the urethra and vagina reappeared. Some authorities at the present day deny any such results, claiming that these local affections are due to the natural migrations of the gonococci, and would occur anyway.

Treatment.— No matter what medicine we use locally or internally, it cannot cure the gonorrhœa unless it has the power of destroying the gonococci. The most effectual medicines used internally are those which are capable of two effects: (1) they must be able to cause a similar irritation in the urinary passages over which they pass to get out of the body; or (2) they must be able to kill the gonococci when brought in contact with them. Not all are able to do both. Cantharis can cause an inflammation of the urethra similar to the effects of the gonococcus, but it is not a destroyer of the gonococcus; for this reason it may and does reduce the urethritis, but it cannot abolish the discharge; and it is the same with several other useful medicines.

Some years ago I suggested to a physician having a large practice in venereal diseases that he make a trial of injections of copaiva in gonorrhœa. He reported several cases in which he had prescribed an aqua copaiva (one drop to one drachm), and stated that when the discharge was yellow, green, and profuse, it was soon cured. In gonorrhœal opthalmia this preparation when applied cured in a short time. The oils of cubebs, sandalwood, and gaultheria can be prepared and used in the same manner. This method, if thoroughly carried out, and proved to be successful, would supersede the internal administration of these unpleasant medicines.

On the other hand, such medicines as copaiva, cubebs, sandalwood, thuya, erigeron, ichthyol, mercury, and creosote, are capable of both effects; yet none of these medicines of either class can cure a gonorrhœal inflammation unless it passes over the mucous surfaces affected. They are of no use in orchitis, ovaritis, salpingitis, endometritis, or rheumatism of a gonorrhœal origin. The reason is evident; for in the beginning of the disease, before the cocci have penetrated deep into the mucous tissues of the urethra or vagina, or migrated to the interior of the uterus or fallopian tubes, the spermatic ducts, or into the blood, injections into the urethra of a saturated solution of pyoctanin two per cent, nitrate of silver, corrosive sublimate 1 to 3000, thallin or ichthyol two per cent, creosote one per cent, or eucalyptol two per cent, will cure the disease by destroying the gonococci. Recently, injections of peroxide of hydrogen, five to ten volumes, is said to abort or arrest the disease if used the first twenty-four hours of the discharge. But the orchitis or

ovaritis will have to be treated by means of remedies having an affiliation with these organs, namely, aconite, hamamelis, conium, phytolacca, apis, salol, mercury, lilium, simulo, etc., and the rheumatism by means of aconite, bryonia, salicin, salicylate of soda (said to be almost specific), etc.

Gonorrhœa in women is not now considered the mild disease it once was. Naeggerath and others have proved to us that the gonococcus may cause dangerous and long-lasting inflammation of the endometrium, fallopian tubes, and ovaries. We should not be content to use remedies confined to the vagina alone, but should apply them to the cervical canal and interior of the uterus, as soon as possible after the infection. If we wait too long we cannot avert serious consequences.

In the above statements I refer only to genuine virulent gonorrhœa; there are several varieties of urethritis not caused by the gonococcus:

(1) Catarrhal urethritis. Dr. Keyes says: "*A priori*, there is no reason why the influence of cold should not produce a catarrhal discharge from the mucous membrane of the urethra just as well as from the other mucous expansions, but clinical experience teaches us that this is the rarest of all causes"; yet I think I have seen a few cases occurring in delicate men, suffering from general catarrhal troubles.

(2) Traumatic urethritis, caused by the use of instruments, the accidental entrance of foreign bodies, and the passage of gravel. I once treated a case of apparent virulent gonorrhœa in a man who denied positively having had intercourse for a year. After suffering two weeks, he discovered the end of a hair, identified as from the pubes, protruding from the urethra, after the extraction of which the discharge ceased of itself in a few days. Large crystals of uric acid in the urethra may cause a urethritis.

(3) Infectious urethritis, from leucorrhœa, the lochia, or the menstrual flow. Keyes believes these may cause a "bastard gonorrhœa," especially in men who have once had the genuine disease.

The diagnostic test is the presence or absence of the virulent gonococcus. Keyes writes: "I have frequently examined the urethral discharges, and intensely purulent ones at that, and, failing to find the gonococcus, have pronounced the source of the alleged con-

tagion to be non-virulent, and the patient to possess a discharge which he could not communicate to another, and I have not yet been proved to be wrong." He admits that he has found gonoccoci in the discharge of men who did not communicate the disease to their wives, but it must be remembered that some persons possess a mysterious immunity against this disease.

Now it is in those varieties of urethritis not genuine that any one of the fifty or more medicines mentioned by Gouland and Lilienthal may prove the curative agent.

Gleet is now known to be caused by two lesions of the urethra — stricture or patches of congestion, with or without granulations. Surgical treatment is needed for the former, but the latter may be cured by internal medicines.

CHAPTER IV.

CONSTITUTIONAL DISEASES.

RHEUMATISM.

DEFINITION. — This term is applied to all inflammatory affections of the fibrous, muscular, and serous tissues which are not clearly referable to injury, gout, pyæmia, or any other well-recognized specific diseases. When the joints are attacked it is called *synovitis*. It generally depends on some general or constitutional morbid state. The causes may be said to be: exposure to cold and wet, sudden chills, long-continued exposure to any cooling influence which exercise or clothing fails to counteract. Residence in cold, damp, and variable climates is a common cause. There is doubtless a hereditary predisposition to rheumatism in certain families. Women after child-birth and children after scarlet-fever are especially liable to it. One attack of rheumatism renders a person very susceptible to its recurrence. A residence in damp basements or houses, or the north side of hills, renders the occupant more liable to attacks. A joint or muscular tissue that has been sprained is more liable to be the locality of an attack. The joints which usually and chiefly suffer are the wrists, elbows, knees, and ankles; and the muscles: the cervical, deltoid, and lumbar.

Fever is usually present. The temperature, sometimes elevated only a degree or two, rarely rises above 105°. It is liable to daily variations, with usually a morning remission, but on the whole irregular and untypical. There is no definite limit of duration to acute rheumatism. The patient may recover in a day or two, or in a week; or the disease may continue several weeks; or become chronic, with recurrences every few months, especially if the patient lives in the same damp, cold locality. The complications are too many and various to be mentioned in this work, but cardiac affections are the

most dangerous and important. The essential pathology of rheumatism is still an unsettled question. Bristowe says, "If there be a rheumatic poison, which is possible, its discovery is in the future." Fuller and Prout believe it is caused by the presence of lactic acid in the blood. A few writers believe it to be a neurosis; others that it is infectious in its nature, and is caused by a specific bacillus. Professor Brouchard believes that the bacillus pyocyanicus is the specific cause. He produced rheumatic phenomena in the lower animals by the intravenous injection of this bacillus, and the toxines secreted by it.

Treatment.— There is no disease, with the exception of phthisis, in which such a multiplicity of remedies have been used. From bleeding, calomel, and quinine, to alkalies, hydrotherapy, and "expectancy," all have been in turns tried and abandoned for something new. At present the dominant school seems to have settled down to the use of the salicylates and antipyretics, aided by hot fermentations and wrapping with cotton. Although salicylic acid and the salicylates have been greatly abused, and have caused great injury to rheumatic patients when used in toxic doses, there is no possible doubt that they are of real benefit to rheumatism. How they act, and how they are able to cure this disease, cannot yet be explained. They are powerfully antiseptic, antifermentive, and antibacterial. Their favorable effects would almost lead one to believe in the theory of the microbic origin of rheumatism. They can in no sense cure by virtue of the law of similia, for in all the symptoms they cause there is not one that bears the slightest resemblance to those of rheumatism.

Toxic doses of salicylic acid and its salts cause nearly all the phenomena of quinine poisoning. There is the same fulness of the head, roaring in the ears, headache, deafness, blindness, ptosis, strabismus, excessive sweating, collapse, cardiac failure, dyspnœa, restlessness passing into delirium-tremens, etc. The chief post-mortem changes are: breaking down of the blood, congestion of most of the viscera, ecchymoses on the skin and serous membranes, etc. Forty-eight grains have been followed by "vomiting, headache, total unconsciousness, stertorous breathing, and death in forty-eight hours." ("Virginia Medical Monthly," June, 1877.) Yet Dr. H. C. Wood ("Therapeutics") says, "Moderate doses increase the arte-

rial pressure and the frequency of the pulse; it increases the force and energy of the heart's beat, probably by excitation of the vaso-motor centre." It seems that, like all other drugs, the action of moderate, and of toxic doses, is almost the opposite. Dr. Wood further says, "Sphygmographic studies prove that the arterial pressure is usually elevated and never depressed by therapeutic doses of this drug." One would naturally ask, Why not always give "therapeutic" doses? also, What is the "therapeutic" dose? The trouble with the dominant school is that they too often begin with the wrong dose. Instead of beginning with the safe and minute, they give the large and unsafe ones. They think they must get pathogenetic effects, in order to get the curative. In this respect the two schools differ widely. The "regulars" seek to attain the *maximum* dose that will cure with safety; the homeopaths seek the *minimum* dose that will cure, and is always safe. Text-books decide that the maximum daily dose of the acid for adults is one drachm; of salicylate of soda, eighty grains. Yet less than these amounts have caused dangerous symptoms and death. The dose is uncertain for two reasons: (1) There are some who are poisoned by small doses on account of idiosyncrasy. (2) It is cumulative in its action. Strickler's assertion has been verified abundantly, that when given in hourly doses of seven to fifteen grains "it causes a disappearance of the symptoms in less than forty-eight hours." These doses cannot always be given with safety. All authorities advise a close watch for its effects, and a cessation of its administration as soon as poisonous effects appear. To me this has always appeared criminal recklessness. There are many observers, myself among the number, who assert that they can get good curative results by means of doses of two or three grains every two or four hours, and if this quantity does not relieve in forty-eight hours the drug is not indicated. I have found that its curative action is greatly aided by the use of aconite in doses of one drop of the tincture or 1x dilution every two hours. I refer to salicylate of soda. I never prescribe the acid, and I am imperative that only the natural (not synthetic) salicylate be dispensed. It has been demonstated that the artificial salicylic acid contains a very poisonous constituent, which is not in the natural, and some observers declare that this impurity is the agent that causes most of the toxic symptoms.

Dr. H. C. Wood ("Therapeutics") says the most efficient methods of administering salicylic acid is in the form of oil of gaultheria and the salicylate of ammonia. He gives the formula for the latter: Salicylic acid, one drachm; syrup, five drachms; aqua ammonia, q. s. to dissolve the acid. Dose, a teaspoonful, which contains ten grains of the acid. The dose of oil of gaultheria is five to ten drops, in capsules or emulsion. I find our sugar discs or cones will hold one drop. I give two to four every two hours with good results.

A reaction is setting in against the salicylates. Dr. McLagan, of the Royal Medical Society, London, in a recent discussion said he had seen deleterious results from the salicylate of soda and the other compounds, and that he had abandoned them. He now used salicin with better results. He asserted that while all the salicyl compounds were anti-rheumatic, salicin was the best. It gave rise to no unpleasant effects. He ordered thirty grains every hour for six hours, and found that in from twelve to twenty-four hours the pain and fever disappeared. The toxic action of salicin must be feeble, for Ranke is said to have taken three ounces without any notable effects. I am inclined to the opinion that the use of these drugs will be greatly modified or abandoned in a few years. The same laudatory praises were once heaped upon the iodides, quinine, salol, and antipyrin. It is certain that they are not safe in the large quantities heretofore given.

The success of the homeopathic school in the treatment of rheumatism is not brilliant, but we can boast that our treatment is not worse than the disease. Aconite seems to be our favorite remedy in the beginning of acute attacks. It certainly modifies the fever, relieves the pain and anxiety, and in some cases will limit the attack to a few days, in most cases when it is not hereditary or a dyscrasia. The regular school report good results from its use, and every day it improves in their estimation. I never saw any good effects from the dilutions above the 2x in rheumatic cases.

Bryonia is next in popularity. Dr. Russell, of London, in his work on "Rheumatism," asserts that it is the most homeopathic remedy to that disease which we possess; not only to the inflammation and pain, but even to the acid state of the blood, as witness the sour sweats. It is certainly the most efficient remedy in synovial and muscular rheumatism. I have often questioned if the bryonia indi-

genous to this country had similar medicinal powers, but no one seems to know.

Francisca uniflora (manaca), a Brazilian remedy, has a reputation as an anti-rheumatic in South America. From a study of its pathogenetic and curative effects, it seems to occupy a position between bryonia and cimicifuga. It causes "intense headache like a band around the head." This is as characteristic as the "band around the heart" of cactus. It causes great pain in the back of the head, neck, and spine, of a lancinating, stitching character; a terrible aching all over, with great heat of the body, followed by profuse sweat, with subsidence of all the sufferings (from large doses of the decoction). I found it quite useful in sub-acute cases, and when the rheumatism seemed to be connected with la grippe. In chronic cases it has acted well. The dose should be from five drops of the tincture or 1x dilution every two or four hours.

Pulsatilla ought to be a good rheumatic remedy, as it belongs to the same botanical family as aconite, clematis, ranunculus, and cimicifuga. The chief indication for its use is the flying character of the inflammation, going from one joint to another, the pale redness of the swelling, and the slight fever. If the rheumatism follows child-birth, suppressed menses, or a sudden disappearance of a catarrh, it is decidedly indicated.

Cimicifuga has peculiar qualities, and its action in rheumatism is not fully understood. It is useful in a rheumatism with but slight fever, but great aching in the muscles and joints. The pain is out of proportion to the fever. It is especially useful in that variety of rheumatism which is associated with chorea. Ringer ("Therapeutics," p. 443) says of it: "This remedy in my hands has yielded very satisfactory results in chronic rheumatism,—for instance, in rheumatoid arthrites, where the joints are much enlarged and stiff, —when the pains are worse at night." He finds it useful in conditions, such as I mentioned above, where pulsatilla is useful. He says the "pains flit from place to place." He further instances cases when "the patient is troubled with pains, apparently rheumatic, in most of the joints, but with scarcely any fever or swelling. The disease soon seats itself in one part, the wrist and hand; the tissues here become much thickened, the bones of the wrists enlarged, till after a time all movement is lost; warmth relieves the pain, which almost

ceases at night. Instant [?] relief will be given by this drug after iodide of potash and other remedies have been fairly tried in vain, the pain giving way at once, and the joints becoming supple and useful."

Quinine or cinchona are rarely useful, but there is one condition occurring in rheumatism where they are fully indicated: when the acute stage has passed, leaving the patient with swollen joints, an afternoon fever, and copious cold or hot sweats, night or day, as soon as he falls asleep. In such instances, ten to thirty drops of tincture cinchona, or one grain of quinine, every two hours, will soon dissipate these symptoms. In some cases of rheumatic night-sweats, quinine acts more promptly when it is given in solution in water, slightly acidulated with sulphuric acid.

Rhus toxicodendron has a sphere of action peculiarly its own; it affects the tendons around the joints, and the attachments of muscles (cimicifuga attacks the belly of the muscle). It is useful, not in inflammatory, but in sub-acute and chronic cases. The characteristic, so often quoted, "worse during rest, better by motion," is misunderstood by many. To be more definite, it is continued rest in one position, which causes a weary, aching, gnawing pain; the patient is forced to move, but the attempt to move the affected part is attended with great pain on account of the soreness and stiffness; but after a few moments of motion the pain is much better, and may continue better as long as he moves. This is the real condition which calls for rhus.

Palliative and Auxiliary Treatment. — We cannot resist the entreaties of the patient to be relieved of pain, so that he can get some sleep and rest; nor should we. It is cruel to allow the patient to be worn out by his sufferings. It retards the cure. External applications have always been, and always will be, demanded. It is doubtful if they really help much, but they give some relief, and divert the patient's mind. He thinks we are doing all we can. Compresses of hot water, or water rendered alkaline by nitrate, or acetate of potash, or bicarbonate of soda, sometimes seem to benefit. I never dared to use cold water, even if my patients would permit it. They seem to have an instinctive dread of any cold application. Embrocations, liniments, and ointments of all kinds have been used; oil of sassafras, gaulthera, peppermint, and many others, have some

reputation. The common soap liniment, with a little menthol in it, is as good as any.

Ichthyol has recently been highly praised. It is painted on the affected joint; sufficient French chalk is strewn on to form a coating, and the whole is to be covered with cotton. The application is to be renewed every twenty-four hours. (Lehman.) In a very severe case of articular rheumatism, Dr. Ackerman determined to try ichthyol (one part ichthyol, four parts petroleum). First, the parts were bathed with soap and tepid water, and then the ointment was rubbed in; after the first inunction the almost unbearable pain in the joints ceased and never returned, and the next morning the patient was able to walk about in her room; the swelling gradually diminished, and in eight days she could walk several hours a day. Many such instances have recently been reported, and I verified its value in acute and chronic rheumatism of the joints. In chronic rheumatism it has been given internally (one grain in pill four times a day), with the result of lessening the swelling and stiffness. It is harmless, and no unpleasant symptom need be feared. It combines in itself the virtues of iodine and sulphur. Many mineral oils are used, and kerosene has a great reputation among the people, who rub it freely into the joints. I have known it to benefit chronic, but never acute, cases. It will blister if used too freely.

The nitrate and the acetate of potash are old remedies, and are still valued by physicians of all schools. The nitrate is indicated for about the same symptoms as colchicum in rheumatic gout, namely, after the pain subsides the joint swells more, but becomes softer; the urine is scanty and high-colored, and deposits a sediment of red muddy matter. Ten grains in a wine-glass of water every four hours acts satisfactorily. The late Dr. Danforth valued very highly the acetate, and treated acute rheumatism successfully with doses of ten to twenty grains four times a day. The late Dr. Bird, of England, wrote: "I have seen the cure to be more rapid, the immediate relief more marked, by the use of acetate of potash, half an ounce, in divided doses, during the twenty-four hours, largely diluted, than by any other treatment." Three days was the usual duration of the pain. He believed it lessened the chances of cardiac complications. The best anodyne for severe pain is McMunn's Elixir of Opium. Thirty to forty drops at night will give rest if not sleep. In very

bad cases a hypodermic of morphia with atropia will have to be used. Wrapping the joints in raw cotton and covering the whole with rubber cloth, causing the joints to sweat freely, generally gives relief. The diet should consist of milk mixed with Vichy water, equal parts, or with pure bicarbonate of soda in it, and other light foods suitable for fever. Lime juice and lemon juice are the only acids permitted, but water, especially alkaline, can be freely used as a beverage.

Chronic rheumatism is a most perplexing and obstinate disease to treat, unless the physician has an establishment in which to place the patient, where baths, electricity, and massage can be used systematically. The patient should be obliged to wear woolen next the skin all the year round; eschew all alcoholic and malt liquors; eat moderately of sugar and acids, but plenty of wholesome foods of which fat and lean meat form a good share. All hot springs, especially if they are alkaline or contain sulphur, are very beneficial. The springs of French Lick, Blue Lick, White Sulphur, Red Sulphur, and others in various states, should be resorted to, and the patient should remain long enough, often several months, to get the good effects of the water. In anæmic or impoverished cases the chalybeate waters should be used, together with cod-liver oil, ichthyol, sulphur, and arsenic.

It is of no use to give our most carefully chosen remedies unless they can be continued for weeks and months. If the rheumatism be syphilitic, iodide of potassa, in material but small doses, is necessary, and will act as a specific. Eclectic physicians value stillingia, corydalis, and berberis aquifolia in such cases. Phytolacca, root and berries, has been of service. The mud-baths of Europe and this country (Las Vegas, N. M.) have often effected surprising cures.

ANÆMIA.

Definition.— Anæmia may be defined as a reduction in the amount of blood as a whole, or of its corpuscles, or of its more important constituents, such as albumen and hæmoglobin. It may be general or local. General anæmia, however, is the only form of which I shall treat.

Anæmia may be grouped as follows: (1) Primary or essential; (2) secondary or symptomatic.

PRIMARY ANÆMIA.

Primary anæmia is that condition known as chlorosis. It is chiefly met with in young girls, rarely seen in men. Blondes are more frequently affected than brunettes. It usually occurs between the fourteenth and seventeenth years. Its chief characteristic is a marked diminution of hæmoglobin. The disease is most common among the ill-fed, overworked girls of large towns, who are confined all day in close, badly-lighted rooms. Lack of exercise and fresh air, and improper food, are the most important causes. It may, however, be caused by emotional and nervous disturbances. This fact has led many writers to consider chlorosis as a neurosis, which it probably often is. It is doubtless often caused by ptomaine poisoning, the result of constipation.

Prognosis and Pathology.—Anæmia is rarely fatal. The fat of the body is generally retained. The heart is usually dilated and the left ventricle hypertrophied, but that organ resumes its normal condition when the blood becomes normal. The change in the hæmoglobin is not a quantitative, but a qualitative change. The red corpuscles may show only a moderate grade of reduction, but the corpuscles themselves are very poor in hæmoglobin. There may be all the physical symptoms and characteristics of a profound anæmia, with blood-corpuscles nearly at a normal standard. Chemical analysis has shown that the normal percentage of iron in the hæmoglobin is absent.

Symptoms.— The complexion is peculiar. It has neither the blanched aspect of hemorrhage nor the muddy pallor of grave anæmia, but a yellow-green tinge, which has given rise to the common name of "green sickness." But the cheeks may have a reddish tint on exertion, and the lips may at times be red. The subjects complain of breathlessness and palpitation, and fainting-fits are common. The eyes have a peculiar brilliancy, and the sclerotica are of a sky-blue color. The appetite is capricious, and abnormal longings for acids, chalk, pencils, white paper, and clay are common. Constipation is nearly always present. Dilation of the stomach is a frequent concomitant.

Palpitation and breathlessness may be the only distressing symptoms of which the patient complains. Percussion may show a slight increase of dullness in the transverse diameter of the heart. A systolic murmur is heard at the apex or base. On the right side of the neck, over the jugular vein, a continuous murmur may be heard — the "humming-top murmur." The pulse is usually full and soft. There is pulsation in the peripheral veins. Fever is not uncommon, and the patients suffer from headache, neuralgia, hysteria, dysmenorrhœa or amenorrhœa. Chlorosis may be mistaken for phthisis, Bright's disease, heart-disease, or leukemia. If any great doubt exists, the blood should be examined chemically and microscopically.

SECONDARY ANÆMIA.

Secondary anæmia may be caused by: (1) hemorrhage; (2) albumenuria or suppuration; (3) cancer; (4) inanition, from defective assimilation of food; (5) toxic, from poisoning by lead, mercury, arsenic, copper, quinine, malaria, syphilis, snake-bites, and various organic poisons; (6) parasites in the stomach and intestines; (7) pregnancy and parturition; and finally, (8) pernicious anæmia.

None of the above secondary varieties need any particular description, except pernicious anæmia. This may be caused by influences which have not yet been ascertained. There is sometimes a history of gastro-intestinal disturbances, mental shock, or worry.

Symptoms.— Addison gives the following graphic description of this disease: "It makes its approach in so slow and insidious a manner that the patient can hardly fix a date to the earliest feeling of that languor which is shortly to become so extreme. The countenance gets pale; the white of the eyes becomes pearly; the general frame flabby rather than wasted; the pulse becomes large, but remarkably soft and compressible, and occasionally with a slight jerk, especially under the slightest excitement; there is an increasing indisposition to exertion, with an uncomfortable feeling of faintness or breathlessness in attempting it; the heart is readily made to palpitate; the whole surface or the body presents a blanched and waxy appearance; the lips, gums, and tongue seem bloodless; the flabbiness of the solids increases; the appetite fails; extreme lan-

guor and faintness supervene; breathlessness and palpitations are produced by the most trifling exertion or emotion; some slight œdema is probably perceived about the ankles; the debility becomes extreme; the patient can no longer rise from bed; the mind occasionally wanders; he falls into a prostrate and half-torpid state, and at length expires. Nevertheless to the very last, and after a sickness of several months' duration, the bulkiness of the general frame and the amount of obesity often presents a most striking contrast to the failure and exhaustion observable in every other respect."

The condition of blood is best given by Osler in his recent "Practice of Medicine":

"The corpuscles may sink to one-fifth or less of the normal number. They may sink to 500,000 per cubic millimetre, and in a case of Quincke's the number was reduced to 143,000 per cubic millimetre. The hæmoglobin is relatively increased, so that the individual globular richness is plus a condition exactly opposite to that which occurs in chlorosis, in which the corpuscular richness in coloring matter is minus. The relative increase in the hæmoglobin is probably associated with the average increase in the size of the red blood-corpuscles. Microscopically the red blood-corpuscles present a great variation in size, and there can be seen large forms, megalocytes, which are often ovid in form, measuring eight, eleven, or even fifteen micromillimetres in diameter, a circumstance Henry regards as indicating a reversion to a lower type. Laache thinks these pathognomic, and they certainly form a constant feature. There are also small round cells, microcytes, from two to six micromillimetres in diameter, and of a deep red color. The corpuscles show a remarkable irregularity in form, elongated and rodlike, or pyriform; one end of a corpuscle may retain its shape, while the other is narrow and extended. To this condition of irregularity Quincke gave the name poikilocytosis. The leucocytes are generally diminished in number, and the relative percentage of the mononuclear elements is somewhat higher than in normal blood."

The cardio-vascular symptoms are important. Hæmic murmurs are constantly present. The larger arteries pulsate visibly, and the throbbing in them may be distressing to the patient. The pulse is full, and frequently suggests the water-hammer beat of aortic insufficiency. The capillary pulse is frequently to be seen. The super-

ficial veins are often prominent, and in two cases I have seen well-marked pulsation in them. Hemorrhages may occur, either in the skin or from the mucous surfaces. Retinal hemorrhages are common. There are rarely any bad symptoms in the respiratory organs.

Gastro-intestinal symptoms, such as dyspepsia, nausea, and vomiting, may be present throughout the disease. Diarrhœa is not infrequent. The urine is usually of a low specific gravity, and sometimes pale, but in other instances it is of a deep sherry color, shown by Hunter and Mott to be due to great excess of urobilin. Fever is a variable symptom. For weeks at a time the temperature may be normal, and then irregular pyrexia may develop. Nervous symptoms may occur, numbness and tingling, and occasionally symptoms resembling those of tabes. Lepine reports a case of extensive paralysis.

Diagnosis.— The close observer will have no difficulty in distinguishing this disease from chlorosis. The relative condition of the blood is the chief diagnostic sign.

Prognosis in pernicious anæmia is bad. Osler says that under the arsenical treatment the ratio of recovery is greater than under any other treatment. Bramwell was the first to introduce this treatment into the old school. He gives what seems enormous doses, but it matters not — if it cures. It may be that the function of assimilation is so paralyzed that only a minute quantity of all that is given is absorbed by the organism. He gives Fowler's solution in constantly increasing doses. Beginning with three drops after meals, it is increased to five at the end of the first week, ten at the end of the second week, fifteen at the end of the third week, and if necessary increased to twenty to twenty-five drops. He says these large doses are well borne. Many cases are reported cured. Dr. A. McPherson, of Toronto ("Medical Record," 1890), presented to the Canadian Medical Association five interesting cases, in which there was irregular elevation of temperature; pallor, with "lemon tint," but without emaciation; high-colored urine with low specific gravity, with the characteristic blood changes, and gastro-intestinal disturbances. In one case the blood contained 745,000 red corpuscles per cubic millimetre, instead of the normal 5,000,000, the characters of the corpuscles being those typical of the disease. This excessive blood destruction, commencing in the portal system and due

to some poison absorbed from the intestinal tract, in which there is probably greatly increased putrefaction going on, was the great characteristic of the disease. In the treatment of these cases he urged the importance of keeping the bowels, as far as possible, clear of decomposing matter, and believed, in addition to an occasional mild calomel purge, that the use of an intestinal disinfectant, such as beta-napthol, five grains, or thymol, three grains, three times a day, would prove beneficial. In the list of medicines arsenic stands at the head and should be given in small doses, say one-fortieth of a grain, every two or three hours after food. If not well borne, smaller doses, even a half drop of Fowler's solution, should be tried every hour. The benefit of arsenic was probably by its action on the blood, rendering the hæmoglobin more difficult of being dissolved out of the corpuscles. The diet should be highly nutritious, and consist of iron-bearing food, as yolk of egg, milk, meat, and cereals of all kinds. It is advisable to treat all grave persistent anæmias with arsenic, as by so doing we might possibly prevent some cases of pernicious anæmia.

Arsenious acid 2x in one-grain doses sometimes acts better than Fowler's solution. Valengin's solution often acts better than Fowler's. Rest in bed and nutritious diet are necessary. Iron has no good effect in this form. Picric acid ought to have a curative effect in minute doses, as it is homeopathically indicated by the characteristic condition of the blood, and symptoms. In some cases the picrate of zinc may be particularly indicated.

Arndt particularly recommends calc. phos., but gives no illustrative cases to prove its value.

The Differential Diagnosis of Anæmia.— True anæmia signifies a reduction in the quantity of blood. It occurs in an acute manner after hemorrhages, or it may be chronic as a manifestation of emaciation of the organism. Quantitative anæmia is characterized by pallor, although the latter symptom may be present even when the blood is qualitatively and quantitatively normal. This latter condition is present in syncope, where the patient has not lost a drop of blood, but bleeds, says Dr. Neusser, "in his own abdomen," the cutaneous vessels being contracted and the intestinal dilated. In collapse, an anæmia similar to that of syncope is present. The former are considered by Neusser as prototypes of acute pseudo-

anæmia, and are to be differentiated from chronic pseudo-anæmia, which originates in an irregular distribution of the blood, as in exophthalmic goitre and the so-called nervous anæmia attended by violent pulsation of the aorta. A form of true anæmia, attended with qualitative changes of the blood, is chlorosis. Chlorosis is characterized by diminution of the coloring matter of the blood, the red corpuscles not being diminished in number. The pronounced anæmia of the mucous membranes and the skin and the fugacious œdema are not pathognomonic of chlorosis, being also present in post-hemorrhagic anæmia. Dyspeptic chlorosis is referred to as anæmia accompanied by gastric disturbances, the latter being symptomatically most prominent. Gastric disturbances are nearly always present in chlorosis, and are characterized either by chemical or mechanical functional disturbances of the stomach.

The chemical disturbances result in either increased or diminished acidity of the gastric secretion, the latter prevailing. In some cases hydrochloric acid may be entirely absent. This latter condition is also present in atrophy of the gastric glands, pernicious anæmia, and carcinoma of the stomach, thus making the differential diagnosis often difficult. In carcinoma of the stomach, the contents nearly always show an acid reaction due to the presence of lactic acid, notwithstanding the absence of hydrochloric acid, and the quantity of pepsin is diminished. In the dyspeptic forms of chlorosis, on the contrary, notwithstanding the absence of hydrochloric acid, pepsin and peptones are always present.

Regarding treatment, Neusser says that many cases are cured by simple iron treatment, whereas in others not only is the iron badly tolerated, but it intensifies the gastric disturbances. The intolerance of many forms of dyspeptic chlorosis for iron may be removed by previous inhalations of oxygen, of which large quantities must be used. He begins with fifty quarts daily, and quickly increases this to from one hundred to two hundred quarts. Crude and desiccated blood have been employed in the treatment, and although he has used them, they were discontinued in consequence of diarrhœa being developed. From many sources it has been observed that in patients with chlorosis, who could not tolerate any preparation of iron, the ingestion of large quantities of raw meat was attended with successful results. This latter method seems in no wise irrational, as

when raw meat is consumed iron is introduced in the form of hæmoglobin, which is at once taken up by the circulation. The objections to it are the obnoxiousness of raw meat to many patients and the danger of tænia. Aside from the objection already cited, the meat diet is often contra-indicated in those cases attended by fœtor from the mouth. The odor is largely derived from scatal, a ptomaine derived from animal food, and for this reason an absolutely vegetable diet is indicated.

There are a few meat extracts, of which Valentine's is the type, that are much better than raw meats or blood. These meat extracts are made as follows: The blood and juices are expressed by intense pressure, at a temperature of 40° F. Then these juices are heated in vacuo, at a temperature of 170° F., which does not injure the albumin or hæmoglobin. I have used Valentine's, Libby's, and Wyeth's, and I find them highly nutritious and palatable to all patients, who soon tire of raw meat or its expressed juice, even with the addition of acid muriatic. All other beef extracts that I have tested are little better than stimulants, acting only by their salts. An eminent English medical writer on Dietetics declares that beef tea and beef extracts are of no more food value than urine, which they closely resemble. This is because the fibrin, albumen, and hæmoglobin are destroyed by the intense heat to which the meat juices are subjected. The three preparations I mentioned can be given in cold water, cold milk, Vichy water, or Apollinaris—from thirty to sixty drops every two or four hours.

The Treatment of Anæmia.— In the treatment of anæmia, the *indicatio causalis* should be predominant. If the cause be hemorrhages, these should be stopped by internal and external remedies, by compression, by ice, etc. If profuse discharges (as prolonged suppuration) be the cause, such constitutional and local measures should be resorted to as will diminish or arrest them. Under this head come cold abscesses, bronchorrhœa, cystitis with copious mucopurulent exudation, and chronic diarrhœa. Excessive lactation and excessive venery act in a similar way. While these inordinate wastes are going on, the blood is being despoiled of its richest elements, its corpuscles and its plasmatic albuminates, and any treatment to be efficacious must reduce to a minimum these losses. If the cause be syphilis, tuberculosis, or cancer, the casual indication is

sufficiently plain. The victim of venereal diseases may get rid of his anæmia, and regain a fair measure of health and vigor, under the reconstituent and anti-syphilitic influence of mercury and potassium iodide; the tuberculous patient may improve by an out-door life and a fortifying regimen generally; even the subject of cancer may be, for a time at least, benefitted by medical or surgical means directed to his morbid conditions. The anæmia may be of toxic origin, being due to malaria, to poisoning by lead, by phosphorus, by mercury, etc., and the treatment will be addressed to such of these agencies as may be found to be operative in the particular case. It would take up too much space here to enumerate all the causes of anæmia and follow out the indications.

In iodiopathic anæmia, one of the most fruitful causes is insufficient food; then want of light and air, excessive bodily exercise, intense heat or cold, depressing emotions, are all important etiological agencies, and, when once recognized, will suggest the only successful means of cure. Anæmia, moreover, besides being symptomatic of hemorrhages, profuse discharges, severe cachexiæ (as before mentioned), may arise from obstacles to taking food (as in stricture of the œsophagus), to dyspepsia, to organic diseases of the heart, to chronic pulmonary disease, to fever, and finally to diseases of the blood-making organs (lymphatic glands, spleen, and marrow of the bones). Anæmia originating in any of these ways can be successfully met only by attention to etiological therapeutics. One of the most common forms of anæmia is that which is symptomatic of severe and prolonged dyspepsia, whether atonic or functional, or the result of chronic catarrh, dilatation of the stomach, round ulcer, etc., and the means, dietetic and remedial, must be directed to the restoration of the damaged digestive functions.

The anæmia of heart-disease is, of course, curable or incurable, according to the nature of the cardiac affection to which it belongs. Digitalis, strophanthus, nitroglycerine, caffeine, adonidine, more than iron or arsenic, are indicated in this anæmia. In the absence of any yet definitely known pathological lesions causative of chlorosis or pernicious anæmia (although the theory which assigns both maladies to disease of the hæmatopoietic organs appears to be the most plausable), it is impossible as yet to fulfil the *indicatio causalis*, and we must content ourselves with attending to the *indicatio morbi*. In fact, in all

kinds of anæmia this indication imposes itself upon the practitioner. To promote sanguification in all forms of anæmia, we rely on two orders of remedial agents: medicinal and hygienic. To take up, first, the medicinal means (though these are by no means the most important), there is still no medicine of such general utility as iron. It is true that we are still ignorant of the precise way in which iron does good, but the fact is none the less indisputable that in a multitude of cases under the influence of this agent the blood improves in corpuscular richness, and all the nutritive energies are augmented. The ferruginous preparations are legion, and we believe, with Niemeyer, that special indications for the exhibition of one or the other of them cannot yet be laid down. In simple anæmia and in chlorosis, almost any of the iron preparations are well tolerated, but in special cases it is necessary to select that kind which agrees best with the stomach. The citrate, tartrate, lactate, pyrophosphate, the reduced iron, Blaud's pill, and the chloro-peptonate are all mild preparations, and are generally borne by weak and delicate stomachs. The tincture of the chloride (the most-used of all the liquid preparations) sometimes acts with marvellous promptness and efficacy, but many patients cannot take it, and not every pharmaceutical product is reliable. Where iron alone does not agree, it may sometimes be associated to advantage with other medicines. Thus the combination with aloes or aloin is especially valuable in many cases of anæmia or chlorosis with constipation.

A favorite pill contains dried sulphate of iron and extract of aloes, of each one grain. To this is sometimes added for each pill one-quarter of a grain of nux vomica, a little capsicum, or one-thirtieth of a grain of arsenic. Dr. Julius Pollock urges the addition of a little rhubarb to the dose of iron in disordered states of the stomach. A pill much prescribed by Vulpian in anæmia and chlorosis ("*Clinique Medicale*," p. 470) consisted of iron by hydrogen, soft extract of cinchona, pulverized rhei, of each equal parts; this was called the compound iron pill of Charité Hospital. The late Dr. Gueneau de Mussy ("*Clinique Medicale*," t. i. p. 209), whose success as a practitioner is well known, was fond of a combination of bismuth with iron, and where the latter, despite the addition of bismuth, still produced irritation of the digestive organs, he did not hesitate to add a little opium or belladonna. This writer

urges that it is not by furnishing to the blood an element that is wanting that iron does good, but by stimulating nutrition, and points to the fact that etiolated plants become green by watering them with ferruginous preparations, and at the same time their chlorophyll does not contain any iron. Huguenin, of Paris, was one of the first to propose the hypodermic method of administering iron, especially in pernicious anæmia, where iron, when taken into the stomach, is not assimilated; and Dr. J. M. DaCosta, of Philadelphia, has used the dialyzed iron to advantage in this way. From five to thirty drops daily may be injected under the skin without fear of abscess.

Dr. Laache, of Christiania, declared, during a recent discussion, that the sole indication for the administration of iron was the existence of true primary chlorosis. The continued employment of preparations of iron is not advisable, and yet relapses are very common as soon as the use of this drug is discontinued. It is very possible that the vascular changes noted by Virchow may have much to do with the occurrence of these frequent relapses.

Arsenic gives good results in cases of progressive pernicious anæmia, but here, too, relapses are not uncommon. It is also necessary, before passing final judgment on the value of any remedy in this disease, to remember that spontaneous recoveries sometimes take place. For this reason it is always well to be guarded in the prognosis of a case of anæmia, even though it be of extreme severity and accompanied by frequent fainting spells. The mode of action of arsenic is as little understood as is that of iron. We know, however, that in the case in which iron is useful (chlorosis), the hæmoglobin is reduced in amount both relatively and absolutely, that is to say, the globules are reduced in number and are also pale in color. In cases of pernicious anæmia, however, in which iron is of no service, the hæmoglobin is only reduced in so far as the number of red blood-corpuscles is less, the corpuscles themselves being of normal color, and containing the correct proportion of this principle. It would seem, therefore, that the iron acts in a special manner upon the hæmoglobin. In certain cases, the so-called fœcal anæmia purgatives are of undoubted service. This form of the disease is probably due to a chronic poisoning by the fœcal matter remaining in the intestines. Kreosote, in doses of one or two drops

after meals, has been found curative in this form of chloro-anæmia.

As to the utility of inhalations of oxygen, authorities are not at all agreed. In pernicious anæmia, or in that form which remains after exhausting hemorrhages, transfusion is often of real service.

Arsenic has of late been highly extolled as a remedy in anæmia, especially in pernicious anæmia, and is said by excellent clinical authorities to merit a place next to iron; in fact, in many cases it does good where the iron preparations utterly fail. Drs. Byrom Bramwell, Mackenzie, and Lockie, of England, have advocated the more free use of arsenical preparations for a tonic and hæmatinic effect. The latter, in the "British Medical Journal" (December 7, 1878), affirms that in many cases of anæmia approaching the so-called essential or pernicious anæmia, arsenic will confer more benefit than any other remedy. Dr. William Osler, in the "Boston Medical and Surgical Journal" (Vol. CXXIX., p. 454), reports remarkable results in puerperal anæmia from the continued administration of Fowler's solution; he reviews the history of the employment of arsenic in pernicious anæmia, and calls attention to the fact that we do not fully understand the reason why this drug should be so useful in some cases and so useless in others. (If Osler had selected arsenic in his cases, according to the law of similia, he would not find so many failures.) It certainly has often the effect in profound anæmia much resembling that of a specific, like that of quinine in ague for instance. "The initial dose," he says, "should be five drops, gradually increased to twenty or thirty drops, three times a day. Puffiness of the eyelids, œdema above the eyebrows, vomiting or diarrhœa, indicate that the drug should be suspended for a time. The point of greatest importance is that this remedy should be given a long time and in increasing doses." I do not advise the large doses of Osler, nor do I believe it should cause drug symptoms. At the same time I know that above the 3x arsenic is useless in anæmia.

Other remedies, as phosphorus, manganese, cod-liver oil, malt preparations, and alcohol, find their application in certain cases. Cod-liver oil is more readily oxidizable than any other fat, and, when tolerated, often constitutes a powerful auxiliary to other means of treatment. Alcohol, in the form of wine or ale, and sometimes where there is great debility, and especially in that anæmia which attends febrile diseases, in the form of brandy or whisky, frequently

proves of aid in stimulating the functions of digestion and assimilation, and preventing inordinate waste. But the hygienic treatment, which comprehends dietetics, exercise, hydrotherapy, ærotherapy, and climatotherapy, attention to rest, the restoration of normal habits of sleep, the rigorous avoidance of all excesses, of all injurious excitements, of depressing emotions, etc., is of far more importance than the medicinal treatment. Hydrotherapy is a powerful stimulant of nutrition, and is commended by Fleury, Dujardin-Beaumetz, Becqueril, and others, as one of the most active agents in the treatment of anæmia. The douches should be as cold as can well be borne, and should be very short at the commencement, of not more than five or six seconds duration. The utility of out-door exercise, of sojourn in the country or at the sea-side, and of mountain life, is sufficiently obvious as being among nature's best and most certain means of reinvigoration. The effect of rarified air upon the body has been studied by different observers. M. Paul Bert found that the blood of the llama of South America absorbed on an average twenty-five per cent more oxygen than the blood of the herbivora of the plains. Muntz kept some rabbits upon the Pic du Midi for a year, after which time he found their blood much richer in the hæmoglobin than that of the rabbits kept for comparison on the lowlands. In order to prove that it was the rarified air and not other conditions which produced this change, Regnard, in his laboratory, subjected a rabbit, enclosed under a bell-glass, to a continuous atmospheric depression, two bell-glasses being placed together so as to allow the rabbit to pass from one to the other when it became necessary to clean and disinfect his quarters. After living in an atmospheric depression corresponding to the height of 3000 metres, which is that of the great St. Bernard, the rabbit was taken out. He was a little fatter than when he had been put in. It was found that his blood absorbed 25 c. c. of oxygen for every 100 c. c. of blood; while in the control-rabbits kept under normal conditions, it was only 17 c. c. These experiments suggest an explanation of the benefit often derived by anæmic and chlorotic patients by going to the mountainous districts. Many cases of anæmia and chlorosis are due primarily to sedentary habits, to breathing hot or impure air, and to neglect of exercise. Without an entire change in the habits of living (due rest, sleep, and abandonment of every degrad-

ing, depressing passion being observed), the dietetic treatment of anæmia can do little good. The dietetic treatment is, of course, the most essential, for it is only through the assimilation of food that we can hope for restoration. On this subject we must be very brief. As a general rule, food for the anæmic should be abundant, nutritious, and easily digestible. There should be predominance of albuminates (milk, eggs, meats, and fish) over carbo-hydrates. Some patients will do better on light meals given frequently; others on not more than two meals a day. For patients with feeble digestive powers, beef peptones, underdone meats, and even, for a time, pancreatized milk, may be necessary. Some bad cases of anæmia and chlorosis do remarkably well on a dietetic system by stuffing, like that recommended by Dr. S. Weir Mitchell in his little treatise on "Fat and Blood." This is combined with much passive exercise by massage and electricity. Gavagé, or forced feeding, performed by the œsophageal tube, gives often brilliant results in certain anæmic conditions where it is impossible sufficiently to nourish the patient by mouth, but where food of a proper kind, when introduced into the stomach, is well digested and assimilated. Some of the most discouraging cases are those that are attended with absolute repugnance to all food, as is often witnessed in pernicious anæmia. Medicines do little towards restoring appetite and digestion, and unless the physician can obtain hints from etiology, and enforce the proper hygiene, he is powerless to benefit his patient.

There are other drugs which are as valuable as those above mentioned. I value nux vomica, ignatia, and strychnia as highly as iron, when the causes lie in the digestive organs, from anæmia of the spinal cord, or from depressing mental influences. A combination of active principles often act better than if given in alternation. Among these I would name arseniates of iron, strychnia and gold; the citrate of iron and strychnia; digitalis and strychnia; the hypophosphites of lime and soda, with arsenic or strychnia.

Summary of the treatment of the different forms of anæmia:

Chlorosis.—Iron in some form is the chief specific. I have found in my practice that the syrup of nitrogenized iron, digitalis, and wild cherry, which I introduced many years ago, has given better satisfaction than any other medicine. It is particularly indicated in the cardio-vascular disturbances of chlorosis; dose, one teaspoonful three

times a day. Next to this I value the compound pill I also introduced, composed of iron one-eighth grain, digitalis one-fifth grain, and strychnia one-hundredth grain; dose, one pill after meals. In some cases of chlorosis there is an abnormal arterial tension, fainting-fits are common, and the fingers are cold and seem absolutely bloodless. In such cases, if one-hundredth grain of glonoin is added to each dose of the above medicines, the patient will improve faster, and be free from the faintings. There is great value in the natural ferruginous waters, especially when the iron is associated with the alkaline salts and sulphur. It is often advisable to send anæmic patients to the springs, if they are located in high altitudes, or where there is no malaria and the sanitary conditions are good. There are many chalybeate springs in Virginia, North Carolina, New York, Colorado, and California, where the surroundings are all that can be desired. Levigo water, brought from a spring in Tyrol, containing arseniate of iron, has been of great service to me in many obstinate cases. The dose is one or two teaspoonfuls after meals. It acts best when taken in a glass of Vichy or some similar alkaline water, or some pure spring or distilled water. Its action can be aided by phosphorus, phosphoric acid, ignatia, strychnia, helonias, manganese, and a residence in the pure rarified air of a high altitude.

Pernicious Anæmia. — Arsenic is the principal remedy; picric acid, picrate of zinc, and lachesis may be of value in some cases.

I desire here to protest against the popular notion that chlorotic patients should exercise in the open air. They may walk slowly or sit or ride; but if they exercise to the point of dyspnœa or palpitation, the heart will suffer, and take on pathological changes, and the strength of the patient will be wasted.

Anæmia from emotional causes are best treated by change of surroundings and by phosphoric acid, ignatia, helonias, aurum, and medicines selected to meet special symptoms. I have cured two cases of profound anæmia from disappointed love, with phosphoric acid, five drops of the dilute three times a day; many cases caused by grief with ignatia 3x; several cases when there was disturbance of the reproductive organs, with helonias and cimicifuga.

Anæmia from hemorrhages require ergotin 2x, ustilago 1x, hydrastis 2x, cinchona mother tincture, and phosphoric acid, even after the loss of blood has been arrested. They prevent its recurrence. Beef

juices, eggs, dark meats, and open-air life are imperatively necessary, if the patient is strong enough to go out.

Anæmia from cancer may be improved but not cured by picrate of iron, arseniate of iron, and the hypophosphites.

Anæmia from syphilis is cured by mercury, especially by the iodides, and by iodide of potassa and iodide of iron.

When the anæmia is from drug-poisoning, as from quinine, lead, arsenic, or mercury, their chemical antidotes must be given.

One important rule should be followed in treating anæmia, namely, the drug selected for the essential condition should be continued for weeks and months. Meanwhile collateral symptoms should be met by appropriate remedies given temporarily.

A novel method of treating chlorosis has been adopted by Dr. J. Cheron in "The Lancet," 1892, namely: scarification of the os uteri. Shubert and others recommend it. The amount of blood to be drawn is about one gramme to every kilogramme of body weight. According to the above observers these slight bleedings greatly increase the number of red corpuscles and the amount of hæmoglobin in the blood. Dr. Cheron, in making use of scarification of the os in the treatment of old standing disease in chlorotic patients, found that the general health as well as the local conditions improved. In many cases an analysis of the blood during and after treatment showed continuous improvement after each scarification. In chlorotic patients congestions of the womb is habitual, and it is easy to obtain forty to sixty grammes of blood at one operation. This local treatment seems likely to be of great benefit to chlorotic women, and it is easy to understand that it can be performed much more readily than venesection. The scarification, if done with antiseptic precautions, is not accompanied by risk.

Dr. Lowenthal, in the "Revue d' Obstétrique et de Gynécologie," reports the results of treating twenty-three patients suffering from chlorosis or hysteria by suppressing the menses. The method employed consisted in injections of hot water of the temperature of at least 49° C., with complete rest in bed. In some very rare cases iced water was employed preferably to hot water. In eighteen cases the remedy was employed for pure chlorosis. The five others comprised two cases of grave hysteria, and three of convalescence from exhausting maladies. In these latter the convalescence was short-

ened. One of the hysterical patients received a marked advantage, and all the chlorotics were cured with surprising rapidity, and without ulterior medication, after from three to five menstrual suppressions. No unpleasant consequences were noted. One pint of water is advised three times daily.

In advising this treatment, we shall find decided opposition from the people, because it runs counter to the popular belief of the danger of arresting the menstrual flow. The same prejudice is against arresting it when the flow exceeds its normal time in cases of menorrhagia, by injections of hot water. I am decidedly in favor of the practice, for I have tested it in both disorders, nor have I ever seen any unpleasant results follow the practice. Patients with metrorrhagia and menorrhagia have all improved under this method of treatment. It is rational to presume that if we prevent the loss of blood, improvement must follow.

CORPULENCY.

Definition.— This condition of abnormal nutrition is also called polysarcia and obesity. In some cases obesity can hardly be said to be abnormal, as when it is hereditary in families, and when the subjects live to a good old age and observe no bad effects from it, except their great bulk. It generally appears after middle age, and often in persons who when young were remarkable for their slender proportions. This is particularly the case among the Jews and some oriental nations. Corpulency is not uncommon in young children, and I have seen a few cases in infancy where it amounted to monstrous proportions.

A peculiarity of obesity which I have never seen mentioned by any writer is, that it sometimes selects certain portions of the body in preference to others. The face and neck may be fat, and no other portion. In some women the bust is selected, and the mammæ grow to monstrous size. In one case which came under my observation, the mammæ, if they could have been weighed, would have turned the scales at ten pounds each. The trunk alone is sometimes adipose, while the arms and legs are slender. The abdomen, in both sexes, is the seat of adipose deposit after middle life. The

thighs and hips in some women increase in size out of proportion to the lower portion of the leg. In such cases the perverted nutrition is not equally distributed,— why, we do not yet know.

The causes are undoubtedly, in most cases, over-eating and over-drinking of fluids, even plain water. But there are exceptions to this, for among my most adipose patients I have noted many who ate very little, and drank less. I particularly remember an Irish girl who lived in my family, and I am sure that she did not consume more than two ounces of solid food a day, yet her weight constantly increased. Lack of proper exercise is a potent cause of obesity. The drinking of whisky and beer are among the most common causes.

Murchison puts corpulency among the functional disorders of the liver — as one of the consequences of hepatic derangement; and he also places emaciation or "abnormal elimination," among its consequences.

The belief, so long prevalent, that fatty food causes corpulency is now abandoned. Murchison admits this, and says that a diet of starch is much more conducive to obesity. He says, "Some of the fattest persons I have met were females who had for a long time eaten little or no fat or oily matter, and who have taken very little solid food, but who have contracted the habit of drinking frequently some mixture of alcohol and sugar, beer, champagne and other wines, and who at the same time have taken little exercise and have suffered from deranged liver."

I am sure that the excessive drinking of calcareous water is a cause of obesity. The so-called "Schwenniger cure," to which Prince Bismarck was subjected, consisted mainly of Ebstein's treatment, with the prohibition of nearly all fluids. Ebstein's theory of the causes of corpulency accords with those of the best physiologists. He says it is not caused by fats, but by all starchy and saccharine foods. In treating of the causes, he writes: "But this much is settled, that to avoid corpulency, or to remove it after it sets in, we must do exactly opposite from what we do to achieve it. Before we begin to speak of the treatment of corpulency, we have to examine the question: What food has a tendency to the accumulation of fat? The first question to be settled is, whether the fat which people deposit in their body is acquired, or manufactured in the body. . . . There can be no doubt

about one principle, *i. e.*, that every species of animals has its own specific fat,— the mutton always as mutton-fat, a dog never contains ox-fat. But it is next to be examined whether they gather it from what they eat, or whether they manufacture it from hydro-carbons, or from the albuminates which they eat. We know, however, that not all fat is derived from the absorbed food, because cows, for example, furnish more fat in the milk they yield than they take in with their food. They must, therefore, manufacture this surplus of fat, either out of the albuminates or the hydro-carbons which their food contains. But whether any of the fat which we eat, in a normal and a healthy body, is retained and collects as fat is not yet decided, because, for example, carnivorous, *i. e.*, such animals as hardly eat any other food than meat and fat, accumulate very little fat, and this is shown very clearly by the dogs. The butcher's dog, which eats hardly anything but meat and fat, seldom fattens. But the lap-dog, which eats very little meat, and a great many dainty bits, especially sugar (hydro-carbon), fattens very quickly; which fact, however, is partially to be explained by the idle life he leads. On the other side, it is certain beyond doubt that albuminates create fat. Some authorities claim that one hundred per cent albumen may create fifty-one to fifty-two per cent fat. But we also know to-day that Liebig was mistaken when he thought that hydro-carbons (sugar, starch, and their products, like alcohol) participate in the creation of fat. But while they do not directly take any part in it, they help indirectly. When there is a large provision of albuminates (meat, milk, eggs, flour, beans, etc.), the hydro-carbons, like sugar, alcohol, etc., increase the deposit of fat out of the albumin. The reason for this is that they contain a large amount of oxygen, and are thereby decomposed in the body into water and carbonates, and in so doing protect a part of the albumin against complete destruction. Fat, on the contrary, decomposes very slowly into water and carbonates, and therefore does not favor the deposit of fat out of the albuminates (like meat), because such albuminates, with much supply of fat, decompose completely, without leaving any fat behind. Thus, we understand why fat is such a very important and valuable food. A great authority of the present time on the physiology of nutrition, the German Professor Voit, of the University of Leipzig, demands as necessary wholesome food for a work-

ingman fifteen ounces of starch (flour, bread, etc.), four ounces of meat food, and two ounces of fat. Nay, he even prefers about ten ounces of bread only and eight ounces of fat. The advantage of fat for the performance of his work is twofold: (1) It diminishes the decomposition of albuminates, and therefore retains their faculty of supporting strength and increasing the power of the muscle; (2) it decreases corpulency, as we have shown above, and thereby again increases his working power."

"To the poor laboring man, as well as to all who have to perform hard labor and endure much fatigue (such as seamen, soldiers, etc.), fat proves itself to be of inestimable value. The same is true of beasts of burden. The great quantity of fat which camels, after having been well fed at home, accumulate in their humps enables them to stand the hardships of the desert so easily. They live, on these travels, where they are imperfectly fed, from the superabundance of their humps, without suffering much thereby. The chamois-hunters on their hard wanderings take fat only along, and no meat of any kind, and they surely could not stand their fatigue if they were fattened by it. And we saw an official recognition of the value of fat (in spite of Banting's prohibition) when the Emperor of Germany demanded fifteen ounces of fat as daily food for his soldiers, before they entered France in the famous war of 1870.

"We have this demonstrated so far: (1) The dangers which threaten corpulent people, and thereby the necessity of working against corpulency with all means at our disposal; (2) the fact that corpulency does not usually exist or originate without too much food; (3) that a certain arrangement of nutrition favors development of corpulency, especially albuminates and too many hydrocarbons, while fat, if eaten in proper proportion, does not increase fat." (Murchison on Diseases of the Liver.)

Writing of the treatment, he denounces the "Banting treatment" as simply "starvation treatment, leading to inanition, and useless and dangerous." The Banting treatment, like that of Catani the Italian, consists of eating lean meat only, except a little very dry toast, and as little water as possible, excluding all fats, oils, butter, milk, cream, potatoes, bread, etc. Oertel's treatment was the same, to which he added systematic exercise, principally hill or mountain climbing.

Ebstein's treatment consists of the following rules: "Sugar, sweet things of any kind, potatoes in every form, must be avoided. The quantity of bread must be reduced to not more than six or seven ounces, daily, and the vegetables allowed are: asparagus, spinach, cabbage, and especially the legumes, like beans and peas. Of meat every kind may be eaten, and fat more especially. The fat of ham, pork, or lamb is not only harmless but useful, as also kidney-fat or bone-marrow. The sauces or 'gravy' must be fat, and vegetables ought to be prepared with a great deal of butter."

He says: "It will require a special prudence to watch a corpulent patient when he begins, under treatment, to lose weight and diminish his bulk. This must, by all means, proceed very slowly, and the patient must feel comparatively well, free from pains, especial weakness, or any other disagreeable symptoms. The diet must consist of three meals: breakfast, with coffee or tea,—but this without milk and sugar,— dinner, and supper."

"The dinner is the most important meal. Nothing should be taken between breakfast and dinner. Supper must be comparatively light. With dinner the patient may take one or two glasses of light wine, white or red. Beer is to be avoided, unless the hydro-carbons are proportionately reduced, and then only a very small quantity can be allowed. The following example may serve as a good illustration of this diet, and the accompanying bill-of-fare as an excellent regimen for such patients. The case was that of an otherwise healthy man of forty-four years, who had suffered from his twenty-fifth year from corpulency, which had constantly increased, while up to that time he had always been lean. His habits of life were moderate, he drank very little, but his occupation was a quiet, sitting one, and his diet was full of albumen, of little fat, and a great deal of hydro-carbons, sugar, etc. Under this diet and mode of life he grew constantly fatter. Then he began to take advice and followed our regimen, with the result of losing twenty pounds in three-quarters of a year. At the same time his capacity for physical and mental work, which had decreased considerably during his constantly increasing corpulency, began to increase again, and his general feeling was one of comfort and health. He had abstained especially from all fat while he grew corpulent."

His diet afterwards, according to the system above described, was the following:

(1) Breakfast. One large cup of black tea, without milk and sugar; about two ounces of white or brown bread, and plenty of butter. Time: in summer, 6.30; in winter, 7.30 A. M.

(2) Dinner (about 2 P. M.). Soup (with bone-marrow occasionally), four to six ounces of meat, boiled or roasted, with fat gravy, especially fat meat, plenty of vegetables, cabbage, and, most of all, legumes (peas and beans). Beets, carrots, and turnips were, on account of the sugar they contained, almost totally excluded, potatoes entirely. After dinner, a little fresh fruit; occasionally some salad or stewed fruit, but without sugar. To this was added two or three glasses of light wine. Soon after dinner a large cup of black tea, again without sugar or milk.

(3) Supper (between 7 and 8 P. M.). In winter regularly, and in summer occasionally, another large cup of tea, without any sugar or milk. One egg, or some small plate of fat meat, or both; or some ham with its fat, sausage, smoked or fresh fish, two ounces of white bread, with plenty of butter, and occasionally a little cheese, and a little fresh fruit.

"Nobody will assert that this is a bill-of-fare of which anyone need complain, either in quantity or variety, and to live on such a regimen for the whole life is certainly no great hardship. This man never suffered from dyspepsia; his appetite was always good; there was always a yearning for his dinner, a distinctly-felt, keen appetite. For supper the desire was not so great, and the appetite was easily appeased. The mode of life during this time was generally a very quiet one, of even activity, physical exercise moderate, and rarely ever were there any great walking-trips undertaken. And this is the treatment, diet, and mode of life to be recommended generally to the corpulent patient,—of course always to be influenced by individual appearance and feeling,—and this should be under the direction of a physician, as we said before and cannot repeat too often. The same identical treatment proves itself highly useful in that form of corpulency which is, as is so often the case, the result of anæmia."

"We refer here to the history of one case out of many at our disposal, as illustrating best the results of our treatment. A young lady of about thirty years suffered from a constantly increasing corpulency, accompanied by anæmia of a high degree, a feeling of great

weakness, and very scanty courses. All this developed itself while the lady followed a very unsuitable dietetic regimen. Iron was used without any benefit; but on adopting the diet above described the circumference of the waist decreased about three inches and everything else in proportion. In half a year the fat had nearly disappeared, and at the same time the other troubles decreased, the courses became regular in every way, and all symptoms of anæmia vanished.

"The same good results are observed in cases of corpulency complicated with gout, and also where the appearance indicates an affection of the heart. Furthermore, we may add that this same treatment has proved itself extremely beneficial in that other plague of mankind, *i. e.*, diabetes. Meat and fat alone has often cured this horrible disease, where all other treatments have failed. In conclusion, we beg to repeat that we hope to have proved that the idea that fat makes fat is a prejudice; and I may add that physiological experiments and experiences agree fully in this respect with the result of medical practice. If the latter had proved nothing but that fat people do not get fatter by eating fat, it should be sufficient to remove forever the 'fat prejudice.' But we have seen, on the contrary, that fat in proper proportion with albuminates and hydrates of carbon actually reduces corpulency."

Dr. Yeo, after a full consideration of the various methods, gives the following useful summary:

"The albuminates in the form of animal food should be strictly limited. Farinaceous and all starchy foods should be reduced to a minimum. Sugar should be entirely prohibited. A moderate amount of fats, for the reasons given by Ebstein, should be allowed. Only a small quantity of fluid should be permitted at meals, but enough should be allowed to aid in the solution and digestion of the food. Hot water or warm aromatic beverages may be taken freely between meals or at the end of the digestive process, especially in gouty cases, on account of their eliminative action. No beer, porter, or sweet wines of any kind should be taken; no spirits, except in very small quantity. It should be generally recognized that the use of alcohol is one of the most common provocatives of obesity. A little hock, still Moselle, or light claret, with some alkaline table water is all that should be allowed. The beneficial effects of such diet will be aided by abundant exercise on foot and by the free use

of saline purgatives, so that we may insure a complete daily unloading of the intestinal canal. It is only necessary to mention a few other details. Of animal foods, all kinds of lean meat may be taken, poultry, game, fish (eels, salmon, and mackerel are best avoided), and eggs.

"Meat should not be taken more than once a day, and not more than six ounces of cooked meat at a time. Two lightly boiled or poached eggs may be taken at one other meal, or a little grilled fish. Bread should be toasted in thin slices and completely, not browned on the surface merely. Hard captain's-biscuit may also be taken. Soups should be avoided, except a few tablespoonfuls of clear soup. Milk should be avoided, unless skimmed and taken as the chief article of diet. All milk and farinaceous puddings and pastry of all kinds are forbidden. Fresh vegetables and fruit are permitted.

"It is important to bear in mind that the actual quantity of food permitted must have a due relation to the physical development of the individual, and what would be adequate in one case might be altogether inadequate in the case of another person of larger physique."

Medicinal Treatment.— The medicinal treatment of obesity is neither safe nor satisfactory. The basis of nearly all anti-fat preparations is iodine. This drug, when given in pathogenetic doses for a considerable time, will cause emaciation. Under its influence the fatty deposits first disappear, then the glandular structures atrophy, the mammæ, ovaries, testicles, and liver dwindle and cease to perform their functions. Neither the iodides of potash, soda, ammonia, or lime, nor the bromides should be used for this purpose.

Fucus vesiculosus, a species of sea-weed, which contains a large percentage of iodine, bromine, and salines, has long had a reputation for the removal of obesity. It was used by the people for that purpose long before it was introduced into medicine. A decoction, as strong as could be taken without disturbing digestion, was given three times a day. It is now prepared in both fluid and solid extract. The dose of the former is one to four fluid drachms; of the latter, five to thirty grains three times a day. M. Duchesne-Dupare claims that it has the effect of "diminishing fat, without in other respects injuring the health." In the "Pharmacology of the Newer Remedies" (pp. 106–113), many cases are reported of cor-

pulency, often excessive, safely removed by this drug. All the reporters agree, however, that a modification of Ebstein's diet should be maintained during its use.

"This remedy is best taken in the morning, fasting. Its use requires no change in the ordinary diet. I have always allowed persons to eat according to their desire; and, apart from too much farinaceous food, beer, prolonged baths, and a too sedentary life, which it is always necessary to avoid, I never impose serious privations. The action of the fucus on the system is very easily proved. After using it some time the patient feels lighter and more active; the stomach acts with more rapidity, and the hour of repast is more impatiently looked for. Flatulency diminishes and then disappears with those who have been habitually accustomed to it. The act of digestion is no longer accompanied by flushings of the face, by fullness and weight in the epigastric region, and flashes of heat toward the head.

"It is not until after two or three weeks that we begin to observe special and characteristic phenomena; then the urine of those under its influence becomes generally more abundant, and begins to present on its surface a coating or black film. It is from this period that the resolvent properties are manifested, and the first intimation of becoming thinner are displayed. This result, which some look forward to with much impatience, is every day more decided, and, although variable in degree, has never yet failed.

"These different phenomena show us, then, in the fucus vesiculosus a real stimulant of the absorbent system, concentrating its action principally on the fatty globules. The thinness which it determines is not always produced in a uniform manner. I have seen it limited to certain isolated parts, which are then almost always those where the fatty tissues accumulate in the greatest abundance. Thus, with one it is the chest, with another the abdomen, and with the third the nape of the neck and the upper part of the shoulders.

"But the destruction of fatty matter is not all that the resolving properties of the fucus vesiculosus is capable of accomplishing; for many observations seem to prove that the same properties may become useful in certain other diseases, such as cutaneous infiltration, passive dropsy, atonic gout, etc."

I have prescribed it in all its forms, but my experience has not

been favorable to its use. It has assisted the proper diet, but it can no more be used to excess than iodine. The waters of the springs of Marienbad, Carlsbad, and others in this country, like the French Lick Springs in Indiana and the sulpho-saline springs in Florida, Colorado, and other states, will, if used freely, assist in the removal of corpulency. It is my opinion that they do not act like iodine on the absorbents, but by provoking excessive excretion, and by preventing the perfect digestion and assimilation of food. In most instances laxative or purgative doses are given an hour or less after meals, which has the effect of hurrying the food out of the stomach and along the intestinal tract. In treating obesity, constipation must not be allowed to exist, and those laxative waters which contain the most sulphates of soda should be selected, and a sufficient quantity prescribed to move the bowels gently but completely.

In the first edition of "New Remedies" I called attention to the observation that birds which fed on the berries of phytolacca lost their adipose tissue. I suggested that this effect was probably due to the large percentage of potash contained in all parts of the plant, and also to some specific power possessed by phytolacca which resembled the effects of iodine. In a few cases I used the juice of the berries as an anti-fat, but the result was not decisive. Lately an inspissated juice of the berries has been widely advertised, and a few physicians have reported good results from its use; but there is not yet sufficient testimony to warrant me in recommending it unreservedly.

Vinegar has been very successful in carrying off the fat, but the patient has usually been carried off with it.

MAL-NUTRITION.— EMACIATION.— LEANNESS.

Thinness is often a family trait, and it may be a national one. Some tribes of half-civilized people appear as possessing abnormal thinness, just as other tribes are adipose. When it is hereditary but little can be done to bring about plumpness. If a member of a plump family becomes thin, we are justified in considering the case one of mal-nutrition. The individual may eat and drink more than any other member of the family, yet remain at less than his normal weight, or lose it continuously. In the absence of tuberculosis or wasting discharges, we must diagnose the case as one of mal-assim-

ilation. There are many causes of this condition which do not show themselves in any other way. Murchison suggests that "in consequence of a deficient formation of bile, or of its impeded passage into the bowels, the assimilation of fatty and albuminous matter is interfered with." Diseases of the pancreas which prevent the normal secretion of pancreatin have the same result, especially in relation to the assimilation and digestion of fat. Such persons have an instinctive aversion to fatty foods. Disorder of the glycogenic function of the liver may lead to emaciation. Most persons of a nervous temperament seem impelled by a desire to be constantly in motion; even in sleep the body is not quiet. The mental processes in such persons are abnormally active. How often we have children under our care whose attendants complain that they "cannot keep them still a minute." This condition is almost a disease — an abnormal motility — and leads to excessive thinness of body. Many women suffer in the same way; they waste faster than they gain. Such persons are in danger of ultimately becoming the victims of chorea, paralysis, insanity, or neurasthenia. They cannot be cured by diet. They should be deprived of all external stimuli — light, noise, intercourse with the outside world, in fact, such isolation as Weir Mitchell advises. In this isolation, together with massage and over-feeding, the leanest becomes plump in a few months, and their nervous erethism leaves them.

Rest, mental and physical, even under unfavorable conditions in life, favors corpulency. When animals are to be fattened rapidly they are placed in dark stables, or cells, and no loud noises are allowed near them. It is said that men who do light work in the cellars of a brewery get fat, but if they are removed to the upper rooms they become lean. Some oriental nations look upon excessive corpulency in women as the acme of physical beauty. Consequently when girls reach a marriageable age, about their tenth year, they are confined in dark rooms and fed on a sweet food made of flour, and allowed sweetmeats, but deprived of water. In a few months these girls become "veritable lumps of fat," as unsightly to Europeans as they are fascinating to the Turks. In some parts of Africa women fatten themselves on fresh honey and fresh dates. In Europe the excessive use of champagne and nuts by indolent women soon brings on corpulency.

It is evident that the dietetic treatment of thinness must be the opposite of that of corpulency. We must first ascertain if the functions of the liver are duly performed. If not, they should be aroused by small doses of hepatic medicines. The two most efficient are iridin and euonymin. The stools should be examined to see if they contain bile, and if the food taken is digested completely. If the liver is not at fault, pepsin, pancreatin, papoid, or diastase, should be given. The vegetable oils seem to me to aid the formation of fat better than any animal fat, except cod-liver oil. It is doubtful if cod-oil owes its fattening properties to the oil itself, for if its constituents are separated from the oil — forming a solid substance called morrhuol—and given to a person suffering from mal-nutrition, we see the same effects as from the oil. This substance contains iodine, bromine, calcarea, and phosphorus, all of which in small quantities aid in arresting emaciation. I have seen excellent results from one grain of morrhuol given after each meal.

If the functional activity of the stomach is normal, those who are thin should be allowed or obliged to eat all sweet farinaceous fruits, and foods sweetened with sugar or honey, keeping just outside the bounds of indigestion. Advise against all active exercise, or as much indolence as is compatible with health. The oil extracted from the berries of saw-palmetto appears to possess extraordinary fattening properties. The "razor-back" hogs of Florida and the Gulf States suddenly get almost fat during the season when they can find the fruit of this shrub. It is a greenish oil, partly volatile, of a pungent taste, but can be given in maltine, or rubbed up with sugar. The dose is fifteen to thirty drops three times a day. I have known it to increase the weight to a surprising degree in a few months. The tincture of the berries is a stimulant and irritant to the genito-urinary and glandular system when taken in large doses, and should not be used except in atonic diseases of those tissues. Only the pure oil should be used when an increase of weight only is desired.

When a lean and emaciated person cannot take fat into the stomach, it can be applied by the dermatic method. Fat rubbed into the clean skin is absorbed and assimilated by the body. It has been observed that the skin of the emaciated is generally dry and harsh. This condition calls for the local use of fats. I recall many cases of

children and adults whose weight was increased by this method. The fats most readily absorbed by the skin are lard, butter, cocoanut oil, olive oil, purified cod-liver oil, and oil of saw-palmetto.

Dr. T. C. Duncan, in his interesting little treatise entitled "How to Be Plump," gives many practical directions. On page 45 he writes:

"Oil or fat may be given by the skin, *i. e.*, applied topically if the digestive organs will not take it. *E. g.*, in one case child teething; marasmatic with whooping cough; had been running down for months, in spite of the most skillful treatment and abundant tonics. When I took charge of the case I thought it could not live two weeks unless speedily relieved. No diet that I could suggest would be taken. Medicines had little effect. Ordered it rubbed every night with sweet-oil. In three days it began to eat, and in two weeks it ate the whole time. 'Soup, soup,' was its cry all day, and if awake at night it would call for 'soup.' From a living skeleton, with a dry, sallow, dirty skin, it became plump, fair, rosy — the picture of health."

DIABETES MELLITUS.

Definition.— A disease of the nutritive system, in which sugar accumulates in the blood, and is excreted in the urine. The daily quantity of urine is also greatly increased.

Purdy, whose monograph is one of the best in medical literature, says, "We have reason to believe that diabetes was known in periods of remote antiquity." He quotes from the Ayur Veda, from Hippocrates, Celsus, Galen, and Aretœus, who gave brief but graphic descriptions of the disease. But the peculiarity of the urine, its sweet properties, was not observed, until about two hundred years ago. It was, however, about one hundred years ago that Dobson showed that this sweet principle was sugar, which he demonstrated by evaporating the urine and producing the sugar in crystals.

This disease is believed by many to be hereditary. The fact that it often coexists in husband and wife has prompted a few writers to suggest that it may be contagious. It is generally a disease of adult life. Men are usually more frequently affected than women. Persons of a neurotic temperament are often affected, and

it is most frequent among the higher classes. Frerichs found that the Hebrew race supplied one-fourth of his cases. In a considerable proportion of cases the subjects have been excessively fat when attacked. (A slight trace of sugar is not uncommon in the urine of obese persons.) It is more common in cities than in the country. Gout, malaria, and syphilis are predisposing causes. I have had three cases due, I believe, to syphilis. The most common cause is mental shock, severe nervous strain, or worry. When a man gives intense application to business, lives a sedentary life, and indulges in excesses of the table, he is in good condition to contract diabetes. It is often caused by injury or disease of the spinal cord or medulla. Some irritative lesion of Bernard's diabetic centre in the medulla may cause it. It has lately been ascertained by Von Mering that lesions of the pancreas cause diabetes. He found that extirpation of the pancreas in dogs caused glycosuria, but if a small portion of the gland was left, sugar did not appear in the urine. This would seem to prove that the pancreas, like the liver, has a double secretion,— an external, which is poured into the intestines, and an internal which passes into the blood. This latter is supposed to be a ferment, in the presence of which alone the normal assimilative processes can take place with the glycogens.

Diabetes is found all over the world, except perhaps in Guinea, where Blair asserts it is absolutely unknown. Compared with the percentage of deaths in Europe, the disease is rare in this country. According to the last census only 2.8 deaths from diabetes occurred to each 1000 inhabitants, while in England and Germany it is from 5 to 9. But these statistics are very untrustworthy. Climate has much influence over diabetes. Dickenson in England and Purdy in this country prove that in cold and damp regions it is much more prevalent than in warm ones. According to a table in his work on diabetes, the rates of deaths in the United States is 1.9 in each 1000 deaths. Vermont, Maine, and Connecticut show the largest percentage. In Vermont it is as high as 6.36 per cent. In Alabama, Arkansas, Mississippi, South Carolina, and Texas, it ranged as low as an average of 0.6. Purdy concludes from this that cold, damp, and mountainous regions are favorable to the production of this disease. California has almost as high a ratio as the New England States. Purdy says this disease has greatly increased since

our civil war. This he suggests is due to altered modes of life, wealth and its luxuries, richer food, and a more sedentary life. He asserts that after a careful study of all the physiological phenomena of diabetes, and the most recent advances upon the subject, his conviction is as follows:

"(1) That the essential feature of diabetes consists of a more or less profound disturbance of the glycogenic function of the liver.

"(2) That the chemico-physiological changes in diabetes result in the arrest of the elaboration of certain foods in their course toward their ultimate destination in the organism, probably as fats, and the intermediate product, passing into the general circulation, escapes from the system, chiefly by way of the kidneys, in the form of sugar.

"(3) That the disease is accompanied by a hyperæmic condition of the liver, and a more or less engorged state of the chylopoietic viscera.

"(4) That recently ascertained facts indicate that, in addition to the liver, the pancreas also is concerned in the production of sugar in the organism, or, to speak more accurately, in preventing the production of sugar in the organism, and consequently diseases of the latter organ are liable to induce diabetes.

"(5) That diabetes may be brought about by diseases which involve the central ganglia that preside over the vasomotor nerves of the liver; by diseases affecting the peripheral distribution of these nerves; and probably, also, by disorders involving inhibitory reflex action of the sympathetic nervous system."

Symptoms.— This disease may be divided into acute and chronic forms, but except in their duration there is no essential difference. It may also be divided into: (1) lipogenic or dietetic, which includes the transient glycosuria of obese persons; (2) neurotic, due to injuries or functional diseases of the nervous system; and (3) pancreatic, in which there is a lesion of the pancreas.

Frequent urination and intense thirst are the first symptoms that mark the onset of the disease. When fully established, the chief symptoms are great thirst, the voiding of large quantities of saccharine urine, a voracious appetite, and generally progressive emaciation.

The Urine.— The amount varies from six to eight pints in mild cases to thirty or forty in severe cases. The specific gravity is high, from 1.025 to 1.045. It is pale in color, almost like water, and has

a sweetish odor and taste. The reaction is acid. In two of my cases the amount of crystals of uric acid in the deposit was enormous. Sugar is present in varying amounts, from one to ten per cent. The total amount excreted during the twenty-four hours may range from ten to twenty ounces, and in very rare cases one to two pounds. Of the various tests for sugar, Fehling's is the one most used; but other tests are perhaps more delicate. Mitchell (Diseases of the Kidneys) prefers Haines'. Trommer's and Brucke's are in favor with some authorities. Purdy values Haines' test very highly; he is doubtful of Fehling's, and considers the fermentation test too slow. For the methods of testing urine for sugar, consult Mitchell's work.

Thirst.— This is one of the most persistent and distressing symptoms of diabetes. The system requires a large amount of water to keep the sugar in solution. The amount of water imbibed bears a definite relation to the quantity excreted. In rare cases the thirst and consumption of water is small, and in these cases the quantity of urine passed is not excessive. The thirst is greatest about two hours after meals. The appetite is usually inordinate, and the digestion good. The tongue is usually dry, red and glazed, and the saliva scanty. The gums may become swollen, and in the last stages an aphthous stomatitis is common. Constipation is the rule. Emaciation steadily progresses, notwithstanding the enormous amount of food consumed. If the amount of sugar excreted is lessened by diet or medicine, a gain in flesh is soon apparent. The skin is dry and harsh, and perspiration rarely occurs. When tuberculosis coexists, drenching sweats may alternate with the polyuria. The temperature is often sub-normal. The pulse is usually frequent, and the tension increased.

Complications.— Boils, carbuncles, and other affections of the skin, especially eczema and pruritus. In women the urine causes intolerable itching of the vulva and pudenda, and in men balanitis. Purpura and gangrene are not uncommon.

Surgical operations in persons having glycosuria almost always result in gangrene. In two cases under my care amputation of a toe became necessary, the cutting of a corn having caused gangrene in a portion of the foot; finally the whole foot was amputated, gangrene following each operation.

If the patient has pneumonia, gangrene usually ends the malady; but, singularly, the breath does not always have a gangrenous odor. Tuberculous broncho-pneumonia is common. It has been doubted if this was a true tuberculous affection, but Osler found the bacilli present in all his cases. Albuminuria, lithæmia, and cystitis sometimes complicate the disease. In the nervous system we often find such manifestations as peripheral neuritis, with lightning-like pains in the legs and loss of the knee jerk; paraplegia, hypochondria, moroseness, and atrophy of the optic nerves. Diabetic coma is the most serious of all the complications, and carries off a large proportion of all cases.

Frerichs recognizes three forms of cases: (1) Those in which, after exertion, the patients were suddenly attacked with weakness, syncope, somnolence, and gradually deepening unconsciousness; death occurring in a few hours.

(2) Cases with preliminary gastric disturbance, such as nausea and vomiting, or some local affection, as pharyngitis, phlegmon, or a pulmonary complication. In such cases the attack begins with headache, delirium, great distress, and dyspnœa, affecting both inspiration and expiration, a condition called by Kussmaul "air-hunger." Cyanosis may or may not be present; if it is present, the pulse becomes rapid and weak, and the patient gradually sinks into coma; the attack lasting from one to five days. There may be a very heavy, sweetish odor of the breath, due to the presence of acetone.

(3) Cases in which, without any previous dyspnœa or distress, the patient is attacked with headache and a feeling of intoxication, and rapidly falls into a deep and fatal coma.

There has been a great deal of dispute as to the nature of these symptoms. It certainly depends upon some toxic agent in the blood. It may be acetone, or oxybutyric acid—the alcoholic fermentation of sugar in the blood; but Purdy's opinion coincides with my own. He says, "I am inclined to believe, however, that the toxic agent or agents which bring about the coma of diabetes, with its associated phenomena, is nothing more nor less than ptomaines. The extensive retrogade metamorphosis of albuminoid substances constantly going on in high grades of the disease, and the diminished alkalinity of the blood, which entails its diminished oxidizing power, certainly combine the most favorable conditions for originating

these toxic agents. In addition to this, the prodromal symptoms of the coma, such as diminution of the urine and constipation of the bowels, by diminishing the avenues of escape, tend to cause accumulation of any toxic agents that may be generated in the system; while some intercurrent disorder or over-fatigue, such as usually precedes the attack, disturbs the normal resisting power of the organism to the poison, completes the chain of causative factors, and precipitates the complication, the symptoms of which strongly indicate the nature of the cause.

Diabetes is also accompanied by the following disorders of the special senses: cataract, retinitis, amaurosis, paralysis of the muscles of accommodation, and aural troubles, otitis media, with or without mastoid disease. Impotence is very common, and is sometimes the first symptom complained of.

Diagnosis.—True diabetes mellitus should be distinguished from temporary glycosuria, which latter is only a transient form, due to certain errors in diet, or a slight mental shock. From simple polyuria, it is distinguished by the persistent presence of sugar in the urine, and the influence of diet both on the sugar and the quantity of urine. In diabetes insipidus, diet does not lessen the quantity of urine, and the disease is curable; this is a rarer disease. If sugar is found in the urine of polyuria, it is slight and very transient. Hysterical women sometimes put sugar in the urine, as I have found in several cases much to my chagrin.

Prognosis.—Osler, who may be said to represent the pessimism of the old school, says: "Personally, I have never seen a recovery from a case of true diabetes. Temporary arrest, reduction to a minimum of the amount of sugar excreted, and prolonged periods of good health, I have frequently seen; but neither in any one of my personal friends or acquaintances who have suffered with the disease, nor in patients who have come under my care in hospitals or private practice, have I known permanent and complete disappearance of the sugar so that an ordinary diet could be taken with impunity." He further says, "cures have been reported," which intimates that it is doubtful if they were permanent cures. Purdy is more hopeful, but not sanguine. He says: "Under twenty to forty-five years the outlook is more hopeful. At the same time it must not be overlooked that up to forty-five years of age diabetes is a very fatal dis-

ease. After middle age, say after fifty, the outlook is decidedly more favorable, as the disease then assumes a mild course and not infrequently terminates in recovery.

The prognosis is much more gloomy when the disease is traceable to disease of the pancreas. It is better in stout than in lean people. The development of cataract indicates an unfavorable termination, usually in six to twelve months. Absence of the patella reflex is equally unfavorable. If a suitable diet removes the sugar from the urine, it is favorable to recovery.

Treatment.— Prophylactic measures should be adopted for persons of diabetic parentage, or in families that present marked tendencies to the disease. In such cases it is advisable to limit their consumption of starchy and saccharine foods to the most moderate proportions. Occupations should be selected which bring with them the least possible mental strain or excitement. From Purdy's tables showing climatic influences, a residence should be selected in those states which show the lowest percentage of deaths from this disease. Purdy says, "A residence should be chosen as near the sea-level as possible, with a mean temperature range of 70° F. If a diabetic patient could spend eight months in southern Florida, from November to April, and the other four months in some more northern state, he would be placed in the most favorable conditions for a recovery, so far as climate goes."

The personal hygiene of the patient is of the utmost importance. He should lead an even, quiet, temperate life, avoiding all mental and physical excesses. The skin should be kept clean, but not over-clean. By this I mean that bathing should not be carried to excess, as it often is, by cold or hot baths every day, or frequent Turkish baths. All dirt should be removed from the skin, but the oil in the skin should not be washed out of it by soaps or alkalies. Soft warm flannels should be worn next the skin summer and winter. Silk is advised, but it cannot be safely worn next the skin in summer and winter — it cannot be safely worn when the temperature ranges below 75° F. Moderate exercise or massage should be had every day.

Dietetic Treatment.— The cardinal axiom is to avoid all carbohydrates in food, *i. e.*, all foods which contain starch and sugar. The nearer we can come to an exclusion of these two substances, the

better for the patient. Without going extensively into a consideration of each article of food, I give Purdy's list of foods permitted and prohibited:

"Foods Permitted.—Meats of all kinds except liver; beef, mutton, pork, poultry, game,— either fresh, roasted, broiled, dried, smoked, cured, potted, or prepared in any way except with sugar, flour, or prohibited vegetables. Soups made from meats without flour, excluding vegetables. Fish of all kinds except oysters and the inner parts of crabs and lobsters. Eggs, bacon, butter, cheese, and oils. Jellies made from Cox's gelatine, unsweetened except with saccharin. Spinach, lettuce, olives, cucumbers, summer-cabbages, mushrooms, brussells-sprouts, and water-cress. Almonds, filberts, walnuts, cocoanuts, and Brazil-nuts. Beverages: Water, including all mineral waters; Rhine wine; California Rislings, and Chablis; New York and Ohio catawbas; Budai Imperial, Schreiber's "dietetic wine," whisky, and gin.

"Foods Prohibited.— Common bread, except as specified below; biscuits, crackers, and cakes. Farinaceous articles, such as potatoes, rice, sago, tapioca, macaroni, vermicelli, common flour, oatmeal, cornmeal, buckwheat flour, barley meal. The liver of all animals, oysters and sugar. Saccharine vegetables, such as turnips, carrots, parsnips, peas, beans, beets, onions, and rhubarb. Blanched vegetables, such as celery, sea-kale, endive, radishes; and all roots, fruits, and chestnuts. Beverages: Tea, coffee, kola, milk, whey, buttermilk, skimmed milk, chocolate, cocoa, malt liquors, cider, champagne, sauternes, sherry, port wine, madeira, and all sweet wines and liquors.

"The discovery of saccharine has furnished us a substitute for sugar which has a sweetening power nearly three hundred times greater than the latter. The tablet form in which saccharine is now put up is very convenient for sweetening beverages; my patients have usually found that food and beverages flavored with saccharin, if not over-sweetened, are quite as agreeable and pleasant as when flavored with sugar." ("Dulcine," a new product, is said to be better.)

In the absence of saccharin, pure glycerine can be used. In regard to the so-called gluten bread and biscuit, Purdy rejects all that are made and sold as such. He quotes from the *exposé* of Dr.

Ch. Harrington, of Boston, who fearlessly published his analysis of these "gluten breads" and "gluten flour." According to his analyses, home-made bread contains 44.99 per cent of starch; graham wafers, from graham flour, 58.45; gluten flour of Farwell and Co., of Watertown, N. Y., 67.17; the special diabetic foods of this firm, 68.18; the gluten flour of the New York Health Food Company, 66.18; bread made from this flour would contain 85.; the gluten wafers of this company 66.96; the Boston Health Food Company's gluten flour, about the same per cent.

"In view of these startling facts," says Purdy, "there seems but one course to pursue with reference to bread if we expect to cure our diabetic patients, and that is to limit or curtail its use in all forms." It is best at first to cut down the use of bread one-half. If the sugar does not decrease, still further curtail it. If no change appears, then prohibit bread of all kinds altogether.

The wines permitted by Purdy contain only one or two grains of sugar to each fluid ounce, and can be drunk in moderation. The mild alkaline waters, like Vichy, Carlsbad (foreign and Colorado), can be used as a beverage. The skimmed-milk diet, so highly lauded by Donken and Tyson, is not suitable in severe cases, for "the milk-sugar it contains acts in the alimentary canal precisely as does grape-sugar." (Parry.)

Coffee is usually permitted, but Purdy, who analyzed an ordinary cup of coffee, says it contains seven and one-half grains of starch to the fluid ounce. A good quality of Ceylon or Assam tea, while it has all the body of coffee, contains a very small percentage of starch. This should be used without milk, but with saccharin if a sweet is desired.

Pure water, or the mildly alkaline, can be used by the patient *ad libitum*, but his food should be limited. It is possible to eat too much diabetic food. If the stomach is overtaxed, indigestion will occur, and fermentation set in. The patient should eat oftener perhaps than three times a day, but the quantity should be small. Eating to satiety should never be indulged in.

Medicinal treatment of saccharine diabetes.—The drugs used by the old school are opium, morphine, codeine, antipyrin, ergot, arsenic, the bromides, iodoform, jambol, etc. Purdy says opium retains its reputation best, as its action in restraining the excretion of sugar is

more uniform than any other drug. Diabetic patients are remarkably tolerant of this drug, and can take it in large doses. Crude opium is rarely used; morphine, according to Dr. Bruce, is the most powerful, but codeine is usually preferred. Dr. Ralfes says that a full dose of opium or morphine at bed-time is the best method of administration, as it is less likely to disturb the digestion or cause headache. By a full dose is meant one or two grains of opium: twenty drops of laudanum or one-fourth grain of morphine. All admit, however, that cures are rare under its use, because it cannot be long continued without causing the opium habit.

Codeine is now preferred, because there is but little danger of causing the "habit" by its use. Its action on the brain is quite different from that of morphine. The dose is one-fourth to one-half grain three times a day, and old-school writers assert that it can safely be increased to five or ten grains daily. I have used codeine, one-fourth grain four times a day, in two cases, with good results. The sugar was lessened from twenty to thirty per cent in two weeks, and the water from six to three quarts; when the codeine was stopped the sugar or water did not increase. It is now nearly a year since the drug was suspended, and the patients are still in good condition. They may not be cured, however. One objection to codeine is its high price. "Six grains of codeine," says Osler, "costs twenty-five cents; whereas the same amount of morphine costs only ten cents." As it is rarely the very poor who have diabetes, this is not much of an objection. Codeine costs my patients only six cents a day. Purdy prefers the bi-meconate of morphia if codeia is not used. A mixture of morphia and atropia has been used with alleged success. Some recent experiments lately made on the drugs which influence the secretion of the pancreas prove that morphia and atropia are the most powerful in arresting the secretion of that gland. It may be found that it is in pancreatic diabetes that these drugs are the most valuable. Antipyrin, so highly praised, is denounced by Purdy, who says that in many cases he had reduced the sugar to five grains to the ounce and the water to two quarts by diet alone; all restrictions as to diet were thrown off, and antipyrin was given — forty-five grains a day — with this result: the sugar increased to fifteen grains to the ounce, and the water in proportion; several of the patients went into coma and died in a few days. Other

drugs of the phenol series have been used, — phenacetine, salol, acetanelid, exalgine, etc.,—and some cures are claimed; but their use is attended with danger, and permanent cures are doubtful.

Creosote, which is allied to these drugs, is credited with some cures that seem permanent. It has been given in doses as large as ten drops three times a day. In our literature it is reported to have cured in the 2x dilution. I very nearly cured a case with ten drops of the 1x four times a day. The sugar was reduced to five grains to the ounce, when the patient left the city and has not reported since. Four drops of the mother tincture three times a day, according to Valentine, in two cases caused sugar to disappear altogether. The bromides have been used with success in many cases. From an analysis of the reports, it would seem that they are best adapted to cases caused by mental disturbances. Nearly thirty-five years ago I had under my care a most obstinate case caused by mental depression. All the then approved drugs were tried unavailingly, when I saw in a number of "Braithwaite" a report by Dr. Begbie, of two cases cured by bromide of potassium, ten grains every four hours. Suspending the strict diet of milk and meats, I gave the bromide in the doses recommended, and cured my patient, at least for eight or ten years. The medicine was continued six weeks, causing some acne and dyspeptic symptoms, which were removed by arsenicum. At one time the bromide of arsenic (one-half grain three times a day) was highly praised, and some French authorities reported cures. It has not been successful in this country, with either school. Purdy says he never got satisfactory results from it. A combination of lithium with arsenic has been highly lauded by Rouget and Martineau. The latter claims to have cured sixty-seven out of seventy cases with it. No other reports as favorable have yet appeared. (Two drops of Fowler's solution, with eight grains of lithium carb., after meals.)

Arsenite of iron (2x trituration, one or two grains after meals) has been very beneficial in my hands when diabetes has been attended by anæmia, or was the result of malarial cachexia. Purdy claims good results from larger doses, one-sixteenth to one-sixth of a grain.

Jambol, the seeds of an East Indian plant (syzygium jambolanum), was first used by English physicians in India, who reported excellent results. The dose was three to five grains of the powdered

seeds, but it has been given in doses as large as thirty grains three times a day. It is notoriously uncertain in its action. In large doses it is said sometimes almost to suppress the urine, without lessening the quantity of sugar. Outside the body it has a decided inhibitory influence upon the action of diastasic ferments. In two experiments narrated in "Pharmacology of the Newer Remedies," a given amount of malt extract converted 22.4 grains of starch into sugar in the absence of jambol, but only 6.3 grains in its presence. If it acts in the same manner in the digestive canal or the blood it ought to prove a good palliative at least. Some interesting experiments were made by Prof. Binz, of Germany, on dogs made diabetic by phloridzin. When the dogs were excreting ten or twelve grammes of sugar daily, jambol was given, and the sugar fell to one or two grammes daily, showing conclusively the power of jambol over the excretion of sugar. Dr. W. H. Burt, of Chicago, in his "Physiological Materia Medica," records some interesting experiments and provings of jambol, and reports several surprising cures of glycosuria with it, one of which I was cognizant of, and is I believe now a permanent cure. In the "Pharmacology of Newer Remedies" nine cases of severe diabetes are reported, treated with jambol. All were greatly benefited, but only one cured. Some failures are also reported. No cures have been reported with the attenuations. The tincture or fluid extract does not seem to act as well as the seeds in powder.

Phloridzin was alluded to above as causing saccharine diabetes in dogs. This would make it a true homeopathic remedy. In one case I resolved to test its value according to the law of similia. It was not a bad case, the sugar not exceeding twenty grains to the ounce. Under the use of five grains of the 1x trituration, every four hours, the excretion of sugar slowly decreased until it was as low as five grains per ounce. (It required twenty-five to forty grammes — three hundred to six hundred grains — daily to cause diabetes in dogs.) Phloridzin is the bitter principle found in the bark and roots of the apple, plum, and cherry trees. It is said to possess decided tonic properties, but we have no proofs.

Uranium nitrate is a drug which has caused an excretion of sugar in the urine, and has been credited with numerous cures in our literature. In my "New Remedies" I give a full history of its path-

ogenetic and curative effects. The triturations from the 3x to 6x have given the best results.

Phosphoric and lactic acid are highly recommended. The former, when the disease is evidently of nervous origin; the latter, when the gastric derangement (acidity and pyrosis) is present.

If the portal system is engorged and the liver torpid, euonymin, podophyllin, irisin, and leptandrin are useful. The late Dr. Laning found leptandra 3x very useful in a case reported in the "Clinique," 1890, p. 227.

Aurum and its preparations have benefited many severe cases. Mercurius also has made some cures.

When the pancreas is suspected as being the cause of the disease it must be owing to a perverted secretion of that gland. Pilocarpine is supposed to increase the natural secretion of the pancreas, and may prove a palliative if not a curative remedy.

The late Dr. Lilienthal compares our chief remedies in relation to pancreatic affections and diabetes as follows:

"*Uranium nitricum.*— Pancreatic symptoms: Ulceration of the duodenum, and also of the pyloric end of the stomach; vomiting of a white fluid; putrid eructations; pains worse from fasting; tympanitis; emaciation and prostration; styes; copious salivation.

Diabetic symptoms: Sugar in the urine: defects of digestion and assimilation; general languor, debility; cold feeling; vertigo; purulent discharges from eyelids and nose; copious salivation; enormous appetite and thirst, but the patient emaciates; excessive flow of urine.

Phosphorus.—Pancreatic symptoms: Tuberculosis; fatty degeneration of various organs, especially the heart, liver, and kidneys; distressing burning pains in the cœliac axis; stools undigested, containing particles of fat; face pale, yellow; neuralgia of cœliac plexus; anæmia; atrophy of pancreas, with diabetes mellitus.

Diabetic symptoms: Diabetes with phthisis; urine profuse, pale, watery or turbid, whitish, like curdled milk; dark yellow, with a gray pellicle, covered with a fatty membrane; gouty diathesis; fungous excrescences; paralyzed sensation in extremities. Phosphoric acid suits more neurogenic diabetes.

Arsenicum album.— Pancreatic symptoms: Organic changes, with restlessness and anxiety; ulceration of the duodenum, involv-

ing the pancreatic duct; stools undigested, containing fat; neuralgia of cœliac plexus; melancholia, with suicidal tendencies; face pale and puffy; extreme thirst and great irritability of the stomach; pain about navel, causing him to bend forward; diarrhœa, with vomiting and prostration. (Vichy contains arsenic.)

Diabetic symptoms: Urine, drawn by the catheter, gives all the characteristic indications of glycosuria; polyuria with bulimy and unquenchable thirst; emaciation and great weakness; watery, dark diarrhœa; disposition to gangrene; slight motion causes dyspnœa, with palpitation and fainting; dropsies. Compare arsenicum bromide and arsenicum iodide.

Iodum. — Pancreatic symptoms: Great emaciation; hungry, anxious if he cannot get food at the appointed time; eats enormously, yet grows thin; soapy taste; fat in the stools; glands enlarged or atrophied; lungs affected. (Rademacher's stand-by in pancreatic disease).

Diabetic symptoms: Diabetes with canine hunger; frequent and copious urination, bright yellow and watery or turbid, milky, with dark sediment; cold hands and feet; rough skin; dizziness, with tendency to fall forward.

Creosotum.— Pancreatic symptoms: Chronic irritability of the stomach, food is not retained or digested; gastromalaria; ulcerative pain in epigastrium on deep breathing; pains in hepatic region, extending to small of back; despondency and loss of memory; tendency to hemorrhages, and rapid decomposition of secretions.

Diabetic symptoms: Perfect depression of the trophic nervous system; frequent and copious urination night and day; great itching of genitals during and after micturition; head confused and dull; dimsightedness; physical exhaustion, worse from rest; bruised sensation in chest and back.

Iris versicolor. — Pancreatic symptoms: Burning distress in pancreatic region; vomiting of sweetish water; saliva has a greasy taste; green watery stools, containing undigested fat; bilious vomiting; migraine.

Diabetic symptoms: Frequent limpid micturition, or scanty, high-colored, and of strong odor; furunculosis; weakness and pain in limbs, so that walking is nearly impossible.

Lycopodium clav.— Pancreatic symptoms: Chronic duodenitis;

pancreatic calculi; pressure on hypochondrium produces tender pains in the epigastrium, and vice versa; icterus; flatulency; constriction of anus and rectum.

Diabetic symptoms: Gouty lithæmia; canine hunger, but the attempt to eat is followed by flatulent distention and satiety; constant desire to urinate, with scanty discharge; mental, nervous, and bodily exhaustion; phthisis and hectic.

Natrum sulfuricum (*Carlsbad, Vichy*), *Hydrogenoid constitution.*— Pancreatic symptoms: Dizziness and headache from gastric derangement and non-assimilation of food; sallow or jaundiced features; vomiting of bitter, sour fluids; flatulent colic; dyspnœa, worse during damp weather; leucæmia; consumption; prostration, and tired weary feeling, especially about knees.

Diabetic symptoms: Depressed and tired of life; dryness and burning in the eyes; dryness of mouth and throat; great thirst for very cold drinks; voracious appetite, but food disagrees; fœtid flatus; increased micturition, especially at night, with burning sensation when passing urine; great weariness, with dull headache; always chilly."

Sulphide of calcium, a drug allied to our hepar sulphur calcium, is reported to have cured some cases in doses of one-tenth to one grain three times a day. In one of our English journals I once saw a report of a cure of diabetes with hepar sulphide calcium 30th dilution.

Strychnine has been useful. Korjinsky cured a case with one-sixtieth grain, increased to one-sixteenth grain, three times a day. Jacobi treats diabetes of infants and children by milk diet, salicylate of sodium five to eight grains three times a day, in Vichy, and one drop of Fowler's solution after meals.

Squire recommends phosphorus, one-thirtieth of a grain three times a day.

Peroxide of hydrogen, or glycozone, is recommended by Purdy and others, in doses of one or two teaspoonfuls in a glass of pure water, several times a day. Inhalations of oxygen have been of benefit in some cases.

Rhus aromatica, so valuable in many renal and cystic disorders, has been found of decided value in diabetes. In "Pharmacology of Newer Remedies" severe cases of diabetes are reported,

all pronounced cured by doses varying from fifteen drops to sixty drops three times a day. Two of the reported cases were diabetes insipidus.

Dr. E. Mansel Sympson, in the "Practitioner," records a case of acute saccharine diabetes in a youth of seventeen years, in which marked improvement took place under sodium salicylate. When first seen, on April 18, he presented the usual symptoms in a marked degree, and was passing seven pints of sugary urine (specific gravity 1050) in the twenty-four hours. On a mixed (though partly restricted) diet and ten grains of salicylate every four hours, at the end of a week the daily quantity of urine had diminished by two pints. During the second week he was put on a strict diet, and had salicylate every six hours. On the twelfth day of treatment he was passing two pints of urine daily, of specific gravity 1014, with a trace of sugar (less than one grain to the ounce). On the eighteenth day sugar had disappeared from the urine. Meanwhile the symptoms gradually subsided, and he gained weight rapidly. On two occasions, when the drug was temporarily suspended, the amount of urine was doubled in quantity. The blood presented no abnormalities, and the motions did not contain fatty matter. In July the patient was well and healthy-looking, and able to take plenty of exercise.

Lycopus has been found curative in diabetes mellitus. Dr. Ray reports several cases in the "Eclectic Medical Journal." They were characterized by the flow of a gallon or more daily of clear urine, of great density and containing sugar, intense thirst, great emaciation, and other well-known symptoms of the disease. After trying a rigid diet and various medicines without much good result, the fluid extract of lycopus was given in doses of thirty drops three times a day, with surprisingly prompt effect. All the symptoms rapidly gave way, until the patients were apparently cured. Thus we have another remedy for that serious and often intractable malady. I published in the "North American Journal of Homeopathy," November, 1878, a remarkable cure of diabetes mellitus by means of the lycopus in infusion, one ounce of the herb to eight ounces of water, a tablespoonful five times a day, continued several weeks.

Drs. De Renzi and Reale, of Naples, give some important experiments, illustrating the causation of diabetes: (1) It may be pro-

duced experimentally by the extirpation of various organs, which, mentioned in the order of their importance, are: the pancreas, duodenum, and the salivary glands. (2) It is produced in animals after total extirpation of the pancreas in seventy-five per cent of the cases. (3) Clinical observation has shown that very grave diabetic symptoms follow the suppression of the salivary secretion, and the authors' experiments were confirmatory of their observations. (4) It is very probable that there exists in the organism a ferment occurring in various amounts in different organs, which ferment destroys sugar.

Their deductions are that the treatment of diabetes should be chiefly dietetic, the best diet consisting of green vegetables and meat in proper proportions. It seems to me that further deductions should be made. Why not give medicines which we know increase the normal secretions of the salivary glands and the pancreas? The two most prominent ones are iris and jaborandi, or their active principles, irisin and pilocarpine. It is possible that the internal administration of pancreatin and ptyaline may be useful, especially when the indigestion seems to call for these two ferments.

Dr. Seeger, of Vienna, says there is a kind of diabetes in which the elimination of sugar is entirely independent of the food taken. We should not be too strict in all cases, but ascertain by experiment whether diet has any influence, and if not, allow our patients sufficient food of all kinds to keep up a high degree of vitality.

Dr. M. L. Huntington, of Darlington, Wis., in a valuable paper on "Glycosuria during pregnancy" ("Homeopathic Journal of Obstetrics," January, 1893), reports a case in which uranium nitrate "was the one and only remedy given until the sugar had almost disappeared from the urine." Then albumen appeared in abundance, with dropsy. Both were cured by helonias. Diabetes during pregnancy is a dangerous event. It may cause the death of the fœtus, and be quickly fatal to the mother. Over one-half of the pregnancies in diabetic women end in the death of the fœtus and miscarriage. "We learn from the experience of Dr. Duncan and others that the glycogenic process is usually exaggerated in a diabetic woman by the coexistence of pregnancy. The manner in which this result is accomplished would be difficult to demonstrate. It has been ascertained, however, that during normal lactation the amount of

glycogen in the blood is increased. This supplies the mammary glands with the necessary sugar to properly elaborate the mother's milk. This increased production of sugar is no doubt controlled in a reflex manner by the activity of the mammary glands, increasing or diminishing according to their needs. If for any reason the stimulation of the glycogenic centres be exaggerated, the amount of sugar produced will be in excess of the need of the mammary glands and will be excreted by the kidneys, producing a temporary glycosuria or aggravating an already existing diabetes."

DIABETES INSIPIDUS.

Definition.— A chronic affection, characterized by the passage of large quantities of normal urine of low specific gravity. This must be distinguished from diuresis or polyuria, which is observed in hysteria, nervousness, after neuralgia, and in Bright's disease.

History.—It is most common in young persons. It may be congenital; I have frequently met with it in infants. It is hereditary in some families. Many of the causes which provoke glycosuria may excite this disease, such as injuries to the head and spine, fright, mental depression, etc. The disease has followed rapidly the copious drinking of cold water or liquor, or has set in during a convalescence. It has been caused by tumors of the brain and medulla, and has accompanied paralysis of the sixth pair of nerves. Irritation of Bernard's "diabetic centre" may cause this disease, as well as sugar diabetes. It has been observed coincident with abdominal tumors, abdominal aneurism, and tuberculous peritonitis. Osler says that the nature of the disease is unknown, but he thinks the most reasonable view is that it results from a vaso-motor disturbance of the renal vessels, due either to local irritation from organic disease or to functional irritation of the vaso-motor centre in the medulla. The kidneys have been found enlarged and congested, and the bladder hypertrophied, but these are doubtless consequences of the disease.

Symptoms.—Many of the symptoms are like those of glycosuria; others are different. The specific gravity of the urine is lower, 1.001 to 1.005; the solid constituents may not be reduced. Urea

has been found in excess. The appetite is good, but not excessive as in true diabetes. The patients do not usually loose flesh but may be well nourished and healthy-looking. In many instances this disease does not seem to interfere with the general health; the great annoyance is the excessive thirst and the frequent calls to urinate. The urine passed may exceed ten to thirty pints a day, and has been known to reach the enormous amount of fifty-six pints.

The perspiration is slight, the skin harsh and dry, the mouth dry, and the saliva scanty. The tolerance for alcohol is remarkable; two pints of brandy or two dozen pints of wine have been drunk in a day by some patients. There is an absence of sugar, except inosite, or muscle sugar; albumen is very rare. Hysterical polyuria may closely simulate this disease. So may Bright's disease, but the presence of albumin and hyaline casts and high arterial tension distinguish the latter from diabetes.

Diuretics may cause a polyuria by acting on the kidneys, but true polyuria is never caused by renal disease. We are often told by patients that they pass great quantities of water, and fear they have diabetes because they are compelled to urinate every few minutes day and night; but if we oblige them to measure their urine, we will find that the amount voided in twenty-four hours is not above normal. They are suffering from irritable bladder. The prognosis is not generally as serious as in glycosuria, except when there is a loss of much solids in the urine; then it is quite serious. In some cases, as in diabetes mellitus, numerous crops of boils reduce the strength of the patient. If anæmia occurs, the prognosis is serious unless we can enrich the blood.

Treatment.— It must be remembered that, as a rule, the true diuretic medicines,—those that act on the renal epithelum and tubules directly,—are not homeopathic to this form of diabetes. Those only are homeopathic which act through the vaso-motor centre, or on the general nervous system. The same remedies recommended for diabetes mellitus have been found useful in this form, namely: codeine, jambol, pilocarpine, rhus aromatica, the bromides, etc. Those which cause sugar in the urine are probably to be excluded. In addition to those above mentioned, I can name: helonias, turpentine,

aurum, glonoine, valerian, phosphoric acid, zinc (phosphide and valerianate), ergot, strychnine, ignatia, arsenic, ferrum arsenite, and apocynum cann. If the heart is very weak, the cardiac tonics in small doses may be useful. I have seen benefit from belladonna, atropine, and hyosiamine in some cases. The diet need not be restricted, as in true diabetes. The food should be abundant and nourishing. Water, except the diuretic waters, may be taken in abundance, and black tea, coffee, kola-nut, chocolate, cocoa, and claret in moderation. I have reason to believe that when there are anæmia and furuncles, the waters of West Baden and French Lick Springs, especially the two lithia springs, taken in small quantities, not more than one ounce three times a day, will be efficacious. The arsenite of iron spring of Tyrol—"Levigo water"—in doses of a teaspoonful after meals, I know to be useful.

The patient should clothe warmly in flannels (as in glycosuria). Vapor baths are recommended. The climate should be warm and moist, as in southern Florida, Cuba, Jamaica, or the Bahama Islands. If it is not possible to make such a radical change of climate, the patient should remain in the house during cold, damp weather.

The following case is taken from the "British Medical Journal": "Dr. A. P. Voinovitch, of St. Petersburg, now reports a case of diabetes insipidus apparently completely and permanently cured by antipyrin. The patient, a retired artilleryman, aged thirty-three, whose father and brother had died from diabetes mellitus, was suddenly seized with insatiable thirst and polyuria during a severe attack of epidemic influenza. The daily quantity of urine occasionally rose to thirteen litres. Antipyrin was given in one-half gramme doses from eight to twelve times a day, the administration being divided into three distinct courses (one of six days duration, another of ten days, and the third of seven), with intervals of three and twenty-three days respectively. The patient was discharged in perfect health on the fourteenth day after discontinuing the treatment, the daily amount of the urine excreted oscillating between 650 and 1100 grammes, and the amount of drink taken averaging 2100. He still remained well at the date of report (about twelve months after the discontinuance of the treatment).

MYALGIA.

Definition.— Myalgia proper includes all those affections which are generally known as "muscular rheumatism," "lumbago," "pleurodynia," "stiff neck," etc. It is an exceedingly painful affection, and much more common than was formerly supposed. It is to Dr. Inman, of England, that we owe the demonstration of the frequent occurrence of this malady, and the facility with which it may be mistaken for other and sometimes much more serious diseases, with very disastrous results. When I first read his book, nearly thirty years ago, I realized how important were his disclosures. Doubtless he was too enthusiastic, but I can readily understand how his enthusiasm carried him beyond the bounds of strict conservatism.

I could see that a large proportion of the disorders which had been called chronic rheumatism and neuralgia did not belong to either disease, but were due to a painful condition of the muscles. Inman defines myalgia as follows: "It is essentially pain produced in a muscle obliged to work when its structure is imperfectly nourished or impaired by disease. It may affect alike the anæmic under-fed man or woman, the muscular laboring man, or a full-fed plethoric man of leisure, if they over-exert, or expose to cold and damp, any muscular structure."

The pain of myalgia is familiar to all. Its type is the "stiff neck," or pain in the back from lifting, or the so-called "crick" in the back. Those who have felt the painful lameness and soreness from an unusual horseback ride, or a long unaccustomed walk, need no other explanation. In our present manner of living very few persons exercise, every day, all the muscles; in fact only a few are brought into constant requisition. When, then, we come to use those unused muscles, they suffer from even a moderate use, and the result is soreness, lameness, and a host of other painful sensations, all of which are included under the name myalgia.

Anstie defines myalgia as "a disease of local origin, and depending for nine-tenths of its causation upon a derangement between the balance of work and nutrition in the muscle."

The following is the differential diagnosis of myalgia from neuralgia:

NEURALGIA.	MYALGIA.
Follows the distribution of a recognizable nerve or nerves.	Attacks a limited area or spot that can be identified with the tendon of a muscle, which will be found to have been unusually exercised, or exposed to a draught of cold damp air, or unsuitable clothing.
Goes with an inherited or acquired nervous temperament.	As often as not occurring in persons with no special neurotic tendency.
Is much less aggravated by movement than myalgia is, and is at first accompanied by no local tenderness.	Is inevitably and very severely aggravated by every movement of the part.
Points which are painful, when established at a later stage, correspond to the emergence of nerves.	Distinguished from neuralgia by localized tenderness on pressure as well as movement.
The pain not materially relieved by any change of posture.	Tender points correspond to tendinous origins and insertions of muscles.
Paroxysms of pain, appearing without appreciable cause. (The only exception to this is *tic*, in which a paroxysm is caused by eating, talking, or laughing.)	Pain usually completely and always considerably relieved by full extension of the painful muscle or muscles. No paroxysms unless brought on by motion.

There is a species of myalgia not mentioned by Inman or Anstie. I refer to that condition designated as muscular rheumatism, which is caused by over-strained muscles or tendons, followed by, or attended with, exposure to cold or dampness. We often see it in horses that have been ridden hard, and left standing in a cold or damp place without sufficient protection or grooming. In both men and horses, the results are a peculiar lameness which causes a desire to move the muscles because they ache, but on beginning to move them the pain is severe, wearing off, however, on continued motion. This is the condition in which rhus is so much and so successfully used. Æsculus and natrum sulph. have this symptom in a less degree.

Treatment.— (1) Place and keep the muscle in a position of full extension, which is only to be changed at rare intervals.

(2) Cover the skin all over and around it with oiled silk, rubber cloth, or spongio-piline, so as to keep the part constantly sweating.

(3) Occasionally rub in chloroform water, or aconite water, or

eucalyptol water, or they can be mixed in equal parts. I use it under the name of "Compound chloroform liniment."

Give internally rhus tox. or rhus venenata, phenacetine, natrum sulph., arnica, cimicifuga, or cannabis indica, or any of the remedies mentioned in our text-books, the symptoms of which correspond accurately to the true myalgic conditions.

Anstie considers muriate of ammonia to be nearly specific. He prescribes it in twenty or thirty grain doses; I find five grains repeated every three hours amply sufficient. An elegant method of administration is the five-grain compressed tablet, which can be swallowed whole.

It is in this disease, especially when it has lasted some time, that acupuncture has made many brilliant cures.

The faradic current often cures myalgia, only a few applications being required. In poorly nourished patients, or those who are anæmic, some constitutional treatment should be given to build up the system. I find that hydrastis, combined with the hypophosphite of soda, and strychnia, give the best satisfaction. Cod-liver oil with hypophosphites is useful in emaciated subjects. Sabal, helonin, aletris, ferrum, and alstonia are also useful, on account of their general restorative powers.

GOUT.

Definition.— An inflammation characterized by the deposition of urate of soda in a crystalline form into the cartilages and other textures of the joints and fibrous tissues. It is usually attended also by constitutional symptoms and grave lesions of important organs.

Causes.— Gout is mainly a disease of middle life and of the male sex. It is more hereditary than any other disease. Dr. Garrod estimates that one-half of all gouty patients get it by heredity. It is also said to be induced by certain habits of life, among which are the long use of alcoholic beverages, constant over-eating of animal food and rich dishes, and, added to these, insufficient exercise. The direct cause is chemical. It is due to an excess of uric acid or urate of soda in the blood. Dr. Murchison believes functional disorders of the liver cause this excess of urates. Dr. Garrod believes the kidneys fail in their function to eliminate the urate from the blood.

Drs. Ord and Bristowe believe that a certain kind of degeneration in the fibroid textures of the body tends to a deposit of urate of soda in those tissues; that it causes inflammation therein, and that during this process the urates are discharged into veins or lymphatics, or both.

Dr. Pye Smith, an eminent authority, has just delivered a lecture before the Royal College of Physicians in London, in which he vigorously challenged the notion that a majority of gout cases are due to over-indulgence in spirits, wines, or malt liquors. He pointed out that in Scotland, where whisky is a favorite beverage, gout is rare. As to port or sherry, he said that in Spain, the home of these wines, the disease is very seldom met with. Then again as to malt liquors: if they are the cause of gout, he asked why the malady did not prevail extensively in Munich and Vienna, where the consumption of beer is universal and enormous. Yet in those cities the malady is but little known. The chief peculiarity about gout is that it principally affects the most civilized nations and the upper classes of society. It prevails among men far more than among women, and attacks the strongest and best-fed persons in otherwise vigorous health. The fact is, according to Dr. Smith, that the cause of the disease is as much a mystery as ever, but it is more reasonable to suppose that it exists in the food than in the drink.

Dr. Roberts says: "In the normal state the uric acid, which circulates in the blood as a quad-urate, is at once removed unchanged by the kidneys. But in the gouty state, either from defective kidney-action or some other cause, this quad-urate lingers unduly in the blood. This detained quad-urate, circulating in a medium which is rich in sodium carbonate, is gradually transformed into sodium bicarbonate, which is almost insoluble in blood-serum, and is probably for that reason difficult of removal by the kidneys. Under these new conditions, sodium bi-urate accumulates more and more, and when the accumulation has reached a certain point, may be precipitated in a crystalline form in the joints and elsewhere, thereby determinating a fit of the gout."

What is a fit of the gout? While I have seen many cases, I cannot describe it as well as Bristowe. "The first attack of gout almost always comes on suddenly, with pain and swelling in the ball of one of the great toes, usually the right; moreover, it occurs for the

most part early in the year, and almost without exception in the night-time. The patient goes to bed probably in his usual health, but awakes about two or three o'clock in the morning, with severe pain in the large joint of one of his big toes. The agony is sometimes so intense that he does not move the affected limb; he cannot bear the pressure of the bed-clothes, or even the slightest jar to his bed, or the slightest movement in his room; his sufferings, too, are often aggravated by cramps and involuntary startings in the muscles of the legs; he becomes restless and hot; shivers, often has repeated rigors, and after tossing about for some hours, falls into a perspiration, and after a few hours falls asleep, from which he awakes refreshed and comparatively easy, but with the toe-joint swollen, tense, and vividly red, and with the superficial veins of the foot, and probably those extending up the leg, unusually distinct and full."

These attacks occur on several successive nights, and then gradually diminish in severity, until in a week or ten days all the suffering has passed away, but leaving the joint swollen, weak, and tender. Gout may attack any joint or any organ of the body, and irritate intensely the whole nervous system, and the mind. I have given the principal symptoms and pathology, for the reason that, while gout is chiefly a disease of England and the northern portion of Europe, it is becoming more common in America, especially in large cities, and in persons of English or German descent. Whenever I have treated cases of gout, I could nearly always get a history of gouty ancestry. But the accumulation of wealth and enjoyment of leisure of the men of this country predisposes them to this disease, aside from heredity, and doubtless in time we shall become as gouty a nation as the English. It therefore behooves physicians to study the disease and all its multifarious manifestations carefully.

Treatment. — What should be done during an inflammatory attack? Most English and French physicians regard any measure to relieve the pain, general or local, as unadvisable. Others hold to the contrary. The affected parts should be kept at rest, if necessary by mechanical means. Hot or wet applications are not generally agreeable, as in rheumatism, but cotton-wool or bran poultices sometimes give comfort.

Ichthyol is said to have anodyne properties when applied to inflammations, and to have the power of penetrating through the skin, so

as to be able to act as an alterative, anodyne, and discutient, in cases of inflammatory enlargement or inflammatory pain. It is said that a fifty per cent ointment with vaseline, if spread over the affected joint, dusted with chalk, and cotton-wool over all, relieves the pain of gout in a short time, and that a continued use of it will shorten the duration, and bring about more rapid resolution. The immediate relief of the pain by medicines is problematical. Opiates are not advised, even by the old school. I have used phenacetine several times with benefit (three grains every hour), but in other cases no anodyne effect was noticeable from it.

Aconite may be useful if we find all the symptoms correspond; as also may veratrum viride, if the arterial tension and temperature is very high.

Colchicum was considered a specific in gout by nearly all English and Continental writers. They are now more cautious in its use than formerly. Once it was considered necessary to give ten to thirty minims every four hours until it purged. It did not give relief until five or six doses had been taken. Now it is taught that it should not be allowed to purge, as by its doing so the patient is often seriously injured. Smaller and more frequently-repeated doses are advised. I have found that in some cases one drachm of the 1x mixed with four ounces of water, and a teaspoonful of this given every half-hour, gives relief in a few hours. Sometimes one drachm of the tincture of the seeds is required. Under its use the urine becomes more profuse, and slight sweating occurs. Good results have been obtained from colchicine in doses of one two-hundredth of a grain every hour. Even this small dose cannot be repeated for any length of time. The provings of apocynum andro. have symptoms very similar to an acute attack of gout. Several cases have been reported where its use in rheumatic gout of the feet has been followed by decided benefit.

The radical treatment of gout must consist first of all in changing the patient's habits, if he uses alcohol, malt liquors, or rich food to excess. He should live on plain food, and exercise freely in the open air. The constant use of pure water containing lithia in some form is considered a *sine qua non* in all cases, but it will be of no benefit if the patient persists in the use of liquors and rich diet.

Theoretically, the lithia salts and lithia water are lauded for

rheumatism, but they are not adapted to that disease. The benzoates of soda and lithium have been praised in gout, and I should expect the latter to be of benefit in acute cases; in chronic cases, also, when the finger-joints are enlarged, I have seen good results from its long-continued use; the effervescing salt, a teaspoonful three times a day, is the best form of administration.

Arnica, internally and externally, has been beneficial. All the other remedies recommended in our text-books are useless. Hughes, who, as an Englishman, ought to know, says: "Gout has no homeopathic literature whatever. I have tried all the remedies which seemed indicated, or have been recommended: aconite, ledum, pulsatilla, arnica, bryonia, and sabina, in the various dilutions, and have never been able to trace any decided effect to their use." He and other English homeopaths give colchicum in small doses, and declare it the only remedy in our materia medica of any real value. Dr. S. M. Cate, of Harvard, Mass., in a recent article on gout, one of the very few which have appeared in our literature, advises copious water-drinking. After giving the indications for twenty or more medicines on the supposition that they ought to be useful, he frankly says that the remedy he has used with the most satisfactory results is sulphurous acid. He uses the officinal solution, one teaspoonful in a tumbler of water, the whole taken at one dose, and "in sensitive persons," he gives one teaspoonful of a 1 to 9 solution at each dose. He says: "In acute cases I give a dose after each meal, or one once in three hours till the pain is relieved, and then only once a day after meals. With this I give the indicated remedy, and cannot see that it interferes with its action; and I have never seen any drug symptoms produced by it." He gives as an illustration a case of chronic articular rheumatism, with all the joints enlarged, very much benefited in five months by the use of this acid, with calc. carb. He says the acid prevents the deposit of urate of soda in the joints, and that in chronic articular rheumatism, as well as in gout, it is present in the joints. No pathologist agrees with him that I am aware of. Longstreet (on Gout and Rheumatism), in his description of the morbid anatomy of the joints in chronic articular rheumatism, does not mention the presence of urate of soda.

Charcot ("Diseases of Old Age") says, when giving the morbid

anatomy of the joints: (1) "At once let us observe that the incrustation of cartilages is inseparable from articular gout." (2) "In a gouty patient the diseased joints alone present this lesion." (3) "This incrustation of urate of soda goes on independently of the paroxysms or attacks." (4) "This lesion is peculiar to gout, and never occurs in articular rheumatism, whether acute or chronic."

DISEASES OF THE THYROID GLAND.

This gland is the subject of several pathological conditions, namely: acute inflammation, congestion or engorgement, goitre, cancers, sarcoma, hydatid and simple cysts, and calculi.

ACUTE INFLAMMATION.

This condition may be idiopathic, although it is very rare; metastatic, as in infectious fevers and pyæmia; and traumatic. The swelling may cause dangerous symptoms by pressure on the trachæa, or prevent the swallowing of food. The treatment should be conducted the same as for mastitis,— by aconite, belladonna, phytolacca, and cold or hot compresses. If abscesses form they should be opened and disinfected by means of iodoform injections.

CONGESTION OR ENGORGEMENT.

This condition may be connected with the menstrual or pregnant states. If it comes on before the first menses, it is an indication for calcarea carbonate, spongia, aurum bromide, or phytolacca. If the turgescence appears before each period, calcarea iodide, or aurum iodide, is indicated. If with the engorgement the menses are profuse and attended by sexual excitement, bromide of potassa and salix niger in large doses are indicated (ten grains of the former and thirty drops of the latter, three or four times a day, beginning a week before the expected menses).

Dr. Scudder recommends iris versicolor for menstrual goitre, but does not explain why. Other eclectic writers assert its usefulness in recent goitres. When the engorgement becomes permanent, then

vascular goitre obtains. If the swelling is connected with cardiac excitement it is probably Basedow's disease (see "Exophthalmia").

GOITRE (Bronchocele).

Definition.— A hypertrophy of the thyroid gland. It may be sporadic or endemic. Sporadic cases are common in all countries. Endemic cases occur principally in the mountains of Switzerland, and in certain parts of England, particularly in Derbyshire; in France, in the valley of the Rhone; in New York, in the valley of the Mohawk; and in the Province of Quebec. Various theories have been advanced as to the nature and cause of goitre, but none is satisfactory. Defective sanitation, dampness, absence of sunlight, residence in marshy and uncultivated valleys or plains, are conditions under which it is most common. In high altitudes it is rarely seen.

The ingredients of certain waters are supposed to cause goitre. It has been proven that lime does not cause it, although it may aggravate certain cases where calcification exists. It seems probable from the experiments of Maumene that the fluorides in drinking-water may be a cause.

There are three distinct varieties of goitre: (1) parenchymous, in which the enlargement is general, and the follicles, usually newly-formed, contain a gelatinous material; (2) vascular, due to dilation of the blood-vessels, without a new formation of glandular tissue; (3) cystic goitre, when it is composed of large cysts, with or without calcified walls. The enlargement may be uniform, or affect but one lobe, or the isthmus alone. When the goitre is small it causes no physical discomfort, but is always a source of mortification to women. When large, the growth may press on the trachæa, causing dyspnœa, or if it extends beneath the sternum, compresses the veins.

No work with which I am acquainted has brought out prominently the fact that there is a connection between vascular goitre and the reproductive organs. Nearly twenty years ago I published a series of cases in which the thyroid engorgement occurred before the first menstruation. On the appearance of the menses, the swelling subsided, to reappear every month, a week or so before the menstrual period. Since then I have occasionally seen brief notices of

that phenomena. One writer mentions having seen cases of recurring goitre, which were probably of the kind I refer to. This variety rarely becomes permanent. I have also observed temporary vascular swelling of the thyroid during the last months of pregnancy.

Diagnosis.— A general hypertrophy of the thyroid may be a sarcoma, carcinoma, or an adenoma, instead of true bronchocele. A differential diagnosis should be made of the three varieties of goitre, because their treatment is essentially different. There is but little difficulty in ascertaining this, if the tactile sense is delicate, for the vascular, cystic, and parenchymous, are not at all alike to the touch.

Treatment.— The regular or old-school treatment internally is with iodine alone. If this fails they have nothing left except local applications externally, or hypodermatically. Their most recent work on practice, that of Osler, mentions no treatment, but relegates the disease to the surgeon.

Iodine is certainly useful in the parenchymous variety, but it should be given in appreciable doses. It is absurd to claim that iodine is homeopathic to goitre. Its primary action in large doses is to cause atrophy of all glandular structures. In small doses it perhaps stimulates some secretory glands, but there is no record of true hypertrophy of glandular structures from its use. The thyroid is not a secretory gland, and is therefore not influenced by the stimulating effect of iodine. To get the curative effect of iodine in appropriate cases, ten or fifteen drops of the ten per cent solution (1x) should be given before meals, when the stomach is empty. The same preparation should be applied externally on lint, and worn at night. With this treatment I have cured many cases. The one per cent solution may be strong enough when the patient is sensitive to its action. Painting the surface with the tincture of iodine is of no value. It has been proven that there is no absorption of iodine thus applied into the blood through the skin. Ointments of iodine, one to ten per cent, have been productive of benefit, but no preparation of iodine can lessen the size of fibroid parenchymous hypertrophy.

Spongia, under the common name of "burnt sponge," has long maintained a reputation in the treatment of goitre. It has been suggested that all its virtues are due to the iodine which it contains.

But Preuss found calcined sponge to contain calcarea sulphate, natrum mur., sodium iodide, magnesium bromide, calcarea carbonate, calcarea phosphate, and protoxide of iron. Our method of preparing sponge by roasting preserves all these constituents. It is a very complex drug, and as nearly all its ingredients may be indicated in goitrous affections, it is the most appropriate remedy we possess. I usually prescribe it in the 1x trituration, giving five to ten grains after meals. Dr. Gilchrist believes he cured a case with the thirtieth, and that "large bilateral tumors, not sharply defined," indicate spongia. It may be useful in vascular goitre, when the heart is dilated, or in the early stage of cystic tumors, or when the parenchyma begins to enlarge by the formation of new glandular elements. After the parenchyma becomes indurated no drug is of benefit.

Calcarea carbonate, prepared from egg-shells, is said to be superior to the pure chemical, just as calcarea phosphate, prepared from bones, is better than the drug prepared in the laboratory. It may be that inorganic substances gain a finer molecular condition when they have passed through the blood or fluids of a living animal, and are therefore better adapted to the requirements of a remedial agent. Hughes, Proll, and Ebstein recommend calcarea carbonate very highly.

The salts of barium, especially the muriate and iodide, should be thoroughly tested in the various forms of goitre.

Calcarea silico-fluoride—the compound salt which is supposed to cause goitre — has, according to Dr. Bellows, cured or benefited many cases.

Fluoric acid was a few years ago highly praised by a few old-school writers, but it has not gained any decided reputation. In several cases under my care it had no perceptible effect. The solution used was 1 in 1000, our 2x dilution, in doses of ten to twenty drops.

Lapis alba, according to Grauvogl, has cured bronchocele. Silica and apis, according to Gilchrist, have cured cystic goitre. Externally, the biniodide of mercury is used in India with great success, according to Quain. Three drachms of the drug are mixed with nine pounds of suet, and this ointment is rubbed into the swelling, which is exposed to the hot sun for several hours. The astounding

statement is made that 60,000 natives were treated by this method, and were nearly all cured.

Eclectic physicians claim good results from ointments of uvedalia and phytolacca. I have never used the former, but have found the latter useful when, during engorgement of the gland, nodular lumps appear and there is some pain and tenderness, a similar condition to that of the mammæ, in which it is so valuable. Hypodermatic injections of iodine, ergotin, carbolic acid, and osmic acid have been recommended.

Iodine used in this manner may reduce the engorgement, but it may also cause the mammæ and other glands to atrophy. It may so completely destroy the gland as to induce myxœdema.

Ergotin and ergotinine are used under the belief that they will constrict the blood-vessels in cases of vascular goitre, but I do not see how this constriction is to be permanent. If they have cured vascular goitre there is no reason why ustilago and hydrastis or hydrastinine should not give the same results.

Carbolic acid has been used in the public clinics in Chicago with undisputed success. Dr. E. O. Haven ("Weekly Medical Review") injects twenty or thirty minims of a five per cent aqueous solution once or twice a week into the substance of the gland. The needle should be introduced from one-half inch to one inch into the gland, and the fluid then slowly injected. Little or no pain is experienced, but only a feeling of dizziness, which passes away in a few minutes. Usually this injection causes a contraction and a hardening of the connective tissue of the tumor, and a gradual lessening of the blood-supply, and in the course of eight or ten weeks a complete disappearance. No other treatment has shown such uniformly good results.

Injections of osmic acid, one grain to two drachms of water, a syringe-full every other day for three weeks, is said to have cured goitre.

The treatment of cystic goitre by injecting into the cavity iodoform in glycerine (1 to 7) or 1 to 7 of ether with the same quantity of olive oil, has been successful; ten to fifteen drops are injected every four to six days. In 150 cases no untoward result occurred, and nearly all improved.

Dr. O'Reilly reports in the "Lancet" (April 2, 1892) success in reducing the size of a goitre estimated to weigh six pounds by the

injection of a solution of perchloride of mercury, alternating with one of iodine and one of permanganate of potash. When the tumor was reduced to about one-third its natural size and had become hard it was removed by operation. Dr. Auerbach advises interstitial injections of osmic acid, followed by massage for fifteen minutes, while iodine is given internally.

Dr. Kapper has reported marked diminution in the size of the enlargement in soft thyroid tumors, following injections of iodoform emulsion, according to Mosetig's plan. In the simple goitre which occurs in pregnancy, as noted by Lawson Tait, and others, there is usually a decrease in the size of the growth, or indeed it may wholly disappear after delivery; but cases have been observed where this fortunate cure did not occur, and an instance has just been recorded by Dr. Jaffroy where there was an increase with succeeding pregnancies, and finally all the symptoms of exophthalmos appeared. Dr. Bally's investigations of seventy-seven cases operated upon at Socin's clinic lead to the conclusion that intra-glandular enucleation is feasible in most cases, is not attended by dangerous hemorrhages, nor followed by paralysis of the vocal cords due to injury of the nerves; while, as regards recurrence, it gives as favorable results as those offered by partial extirpation, and the operation is not followed by any disagreeable consequences, such as tetany or cachexia. Fortunately, goitre is not very common in the United States; but when, as was recently noted in the "Record," no less than 420,000 persons suffer from the disease in thirty departments of France alone, the question of treatment becomes a very important one.

In the presence of so much conflicting testimony concerning the merits of the various methods of treating goitre, one naturally hesitates in making choice. To be sure, we must take into consideration whether the growth be parenchymatous or cystic, simple or exophthalmic, recent or of long-standing. The plan of treatment then to be adopted will be either by internal remedies, external applications, interstitial injections, electricity, or operation; possibly some of these methods may be combined. To instance two widely separate methods, geographical as well as therapeutic: Dr. Upendra Nath Sen writes in the "Indian Medical Gazette" (March, 1892), that at Mymensing it is an every-day occurrence to treat half-a-dozen cases, since half the population is affected. This great prevalence he attrib-

utes to the water of the Jamuna River. His treatment consists in the outward application of biniodide of mercury ointment, and the secret of success lies in the fact that "the patient must be kept facing toward the east sun at least two hours, when the ointment will be absorbed." The cure is more rapid if the tincture of iron be given internally at the same time.

Dr. Cline, of Woodstock, Va., states that he has "been surprised just twenty-two times in the cure of goitre." Tincture of iodine is used externally, while corydalis and iodide of potassium are given by the mouth.

MYXŒDEMA.

Definition.—A dropsical condition of the sub-cutaneous tissues, brought about by the congenital absence of the thyroid gland, or its surgical removal. There are three forms of this disease, as follows:

(1) Congenital.—In which there is absence of the thyroid, and the child is a dwarf, having a thick neck, short arms and legs, and prominent abdomen. The face is large, lips thick, and the tongue is usually so big that it protudes.

(2) Myxœdema proper.—This is more common in England than in this country. It occurs generally in women; it may be transmitted through the mother to several members of a family. It may begin with exophthalmic goitre. The characteristic symptoms are a general increase of the bulk of the body; a firm elastic swelling of the skin, which does not pit on pressure. The skin is dry and rough, the face loses its expression, and the hair loses its nutrition. The features become coarser and repulsive, the lips and nose become thick, the mouth enlarged, and the mind becomes affected with slowness of thought and movement. The memory is defective; patients become irritable and suspicious, and have delusions and hallucinations. The gait is heavy and slow. The temperature is below normal. Hemorrhage, albuminuria, and glycosuria may occur. The thyroid gland is diminished in size, and may become completely atrophied and converted into a fibrous mass. The course of the disease is slow, and may extend over ten or fifteen years.

(3) Operative myxœdema.—This is caused by surgical removal of the thyroid. Dr. Horseley removed the thyroid gland of monkeys,

and in every case it was followed by a condition similar to that of myxœdema, often attended with spasms or tetanoid contractions and apathy, followed by coma. A curious fact was developed during these experiments. If the monkeys were kept warm, myxœdema was arrested, and instead developed a condition which closely resembled critinism. The same condition may follow the operation in man. When the gland is removed, if a small piece is left the myxœdema does not obtain.

Treatment.— No medicine has any favorable effect on this condition, but, as the patients are worse in cold and better in warm weather, their condition can be greatly ameliorated by sending them to warm climates. I have seen but two cases; that was many years ago, before its real nature was known. If the thyroid has to be removed, a small portion should be left in situ. When it has been completely extirpated, a small piece of healthy gland from an animal can be inserted somewhere beneath the skin. In Merklin's case, where a woman of forty-one years greatly improved, the graft was one of the lobes of the thyroid of a sheep. It was transplanted under the skin of the sub-mammary region.

"A case of myxœdema, in London," says the "Medical Record, "is now under a curious treatment. The patient is a woman aged forty, who for nearly three years has been under treatment for myxœdema. In every respect it is an extremely typical case; persistently subnormal temperature, general swelling of the integuments, dryness of the skin, partial baldness, clumsiness of movement, slowness and thickness of speech, etc. The patient was admitted to the hospital in July, under the care of Dr. Hector Mackenzie, for the third time, in order to be treated by hypodermic injections of thyroid juice. In consequence of the difficulty experienced in obtaining the latter, Dr. Mackenzie was induced to try the effect of feeding the patient on fresh thyroid glands. The result has been a very striking improvement. The myxœdematous swelling has entirely disappeared, the temperature has become steadily normal, the skin moist, and the speech natural. The patient asserts that she feels perfectly well."

A writer in the London "Lancet" says:

"The belief in the importance to the animal economy of the presence in the normal state of such bodies as the thyroid, suprarenal capsules, etc., is steadily gaining ground in this centre of med-

ical activity. That organs unprovided with excretory ducts do form some product which is reabsorbed into the blood is proved by the disastrous effects following their removal. The development of myxœdema in persons whose bronchocelic thyroids have been removed is a phenomenon familiar to all practitioners of medicine. It is further proved by the experiments of Hedon, of Montepellier, already communicated by me to the 'Lancet,' that the continued vitality of a grafted portion of the pancreas insures the animal against diabetes, even though the intra-abdominal portion be excised. That condition is, on the contrary, induced by the total ablation of the normal but evicted pancreas, and also by the destruction of the grafts, the intra-abdominal portion being left in situ. As regards myxœdema, Professor Bouchard reports two cases recently treated by him at the Charite Hospital by means of injections of thyroid juice. Both patients were females, and the improvement was, in each instance, extraordinarily rapid."

SEPTICÆMIA.

Definition.— Septicæmia is a general febrile affection, without foci of suppuration. The organisms producing this condition are generally those of suppuration. Senn says it assumes three forms:

(1) Fermentation fever.— Aseptic fever or after-fever, the simplest of all wound complications. It is the febrile process which is produced after transfusion or the injection of pepsin into the blood. This fever may follow any injury or operation, particularly if there has been necrosis of the superficial tissues by the solution used in the dressing. It may follow the extravasation of blood, particularly when under pressure or tension. The fever, which appears a few hours after the injury or operation, is not preceded by a chill. It usually reaches its height rapidly, sometimes to 103° or 104° F. There is not much general disturbance, and the fever usually subsides in from one to three days.

(2) Sapræmia.— This is a septic intoxication caused by the ptomaines produced in wounds by the putrefactive bacteria. In the growth of these organisms chemical poisons (toxins) are produced, and the symptoms are caused by the absorption of these toxins.

The symptoms vary with the quantity absorbed. In about twenty-four hours after the injury or operation, a chill is observed; after which the fever rises rapidly, reaching 103° or 104° F., with quick pulse, great prostration, headache, restlessness, and delirium. The tongue is dry and glazed, and there may be severe gastric irritation and all the phenomena of severe infection.

(3) Progressive septicæmia.— In this form, the septic poisoning is not the result of the bacteria of putrefaction, but organisms enter the blood from some local septic focus, and these form ptomaines. Pus microbes are the most frequent cause of this form of septicæmia. We find this form in puerperal fever and dissection wounds, and the course of the infection may be traced along the lymphatics. The initial chill may occur within twenty-four hours, or not until the third or fourth day. The fever is moderate at first, but gradually rises, and is marked by daily remissions and even intermissions. The pulse is small and soft, and may reach 120 or higher. The tongue is red at the margin, and the dorsum dry and dark. There may be delirium or marked mental prostration and apathy. Pallor of the face, with a yellow hue, appears after a time. Capillary hemorrhages are not uncommon. Death may occur within twenty-four hours in severe cases; life is rarely prolonged more than a week.

PYÆMIA.

Definition.— A condition characterized by recurring chills and an intermitting fever, with the formation of abscesses in various parts, resulting from the contamination of the blood by products arising from a foci wherein are the bacteria of suppuration. It may be caused by thrombosis and embolism. According to Klebs, Koch, and others, micro-organisms play an important role in this disease. The pus microbes and their toxins cause nearly all the symptoms of this condition. The entrance of these organisms in small numbers into the blood does not necessarily cause pyæmia. A thrombus which does not come from an infected source will not cause it. One form of pyæmia is caused by suppurative endocarditis, primary or secondary.

The diagnosis of pyæmia from septicæmia is often difficult. It

may be mistaken for osteo-myelitis, or the septic infection which follows gonorrhœa and scarlatina, typhoid fever, or tuberculosis. Dr. Helmuth says, "In pyæmia the contamination of the blood takes place through the blood-vessels; in septicæmia, through the lymphatics. The chills in pyæmia are recurrent or intermittent; in septicæmia there is but one slight chill. There is jaundice in pyæmia; paleness in septicæmia." The chills, fever, perspiration, and jaundice may simulate intermittent malarial fever.

Treatment.—The radical treatment of these conditions belongs to the domain of surgery. The most that medicine can do is to modify and palliate the symptoms. Internal antiseptics are of no practical value. We cannot safely inject into the blood a sufficient quantity of any antiseptic to change its condition by destroying the organisms or their resultant toxins. Quinine has no curative power; it neither supports the patient nor breaks up the febrile paroxysms. Its only value is a diagnostic one. If we are in doubt whether the fever is malarial or pyæmic, quinine may be given. If it arrests the paroxysms then they are malarial. Osler says, "The practitioner may take it as a safe rule that an intermittent fever which resists quinine is not malaria."

Dr. Pomeroy, in his article on Pyæmia in Arndt's "Practice," recommends quinine "when there is a tendency to periodicity of the symptoms." This is misleading. It may be of some value when its characteristic symptoms are present, namely, profuse perspiration during sleep, ringing in the ears, deafness, etc., but even in such cases I prefer the tincture of cinchona. Nor is it of any use to give veratrum viride, aconite, or gelsemium to control the temperature, for they will not do it, unless massive doses are given, and then they act like antipyrin and other chemical antipyretics; they injure the integrity of the system, rather than modify the ravages of the poisons in the blood.

The surgeon should evacuate the pus wherever found, and render the cavity aseptic. The obstetrician should wash out the uterus with boric acid, benzo-naphthol, or eucalyptol water, and if there are foreign infective matters adhering, remove them with the curette.

Eucalyptus and baptisia internally, in the mother tincture or 1x, act better than any other drug. The diet should be sustaining and nourishing; milk, koumiss, buttermilk, egg-nog, beef extract, and

broth, should be given and injected per the rectum. The drinks should be red wine, lemonade, or water slightly acidulated with any of the mineral acids; and the body frequently sponged with eucalyptus water, or thymol-hydrastis, diluted.

PURPURA.

Definition. — A condition of the blood and capillary vessels which allows extravasation into the skin and sub-cutaneous tissue. It can hardly be called a disease, but a symptom appertaining to many diseases. Purpuric spots vary in size from a point to an area of an inch or more in diameter. When small and like pin-points they are called petechiæ; when large they are known as ecchymoses. At first generally bright-red in color, they become darker, and gradually fade to brownish or greenish-yellow stains. They do not disappear on pressure. It is not easy to make a satisfactory classification of purpura. The following is probably as good a division as can be made:

(1) Purpura traumatica.—When it arises from a blow or strain, or the efforts made during whooping-cough and straining at stool. In a case of constipation under my care, in a man of thirty, the spasmodic straining was so violent that every stool was followed by petechial spots all over the face, neck, and chest.

(2) Symptomatic or infectious.— When it occurs in pyæmia, septicæmia, typhus-fever, measles, scarlet-fever, and malignant endocarditis.

(3) Cachectic.—When it develops during scurvy, cancer, tuberculosis, Bright's disease, and in senility. In these cases the spots are usually confined to the extremities — the lower legs, and the wrists and hands.

(4) Neurotic.—When it occurs during locomotor ataxia, and follows the lightning-like pains. It also occurs during cerebro-spinal meningitis, myelitis, and sometimes attends violent neuralgia. There is an hysterical form called stigmata, when bleeding points appear on the skin, as in some nuns in whom the points appear in the hands and feet at the points where the nails were supposed to have been driven when Christ was suspended to the cross.

(5) Toxic.—When it is due to the action of drugs, such as phosphorus, secale, ustilago, copaiva, quinine, belladonna, rhus, turpentine, sulphuric acid, erigeron, arnica, hamamelis, arsenic, chloral, iodine and the iodides, bromine and the bromides, ledum, bellis, and bryonia. The virus of snakes (crotalus, lachesis, naja, and others), the bites of fleas, mosquitoes, and other insects, will in some individuals cause petechiæ. The purpura occurring in malignant jaundice comes under this head.

(6) Arthritic or rheumatic.—There are three varieties of this purpura. One called purpura simplex, seen most commonly in children, in whom, with or without pain in the joints, purple spots appear on the legs, generally the shins, rarely upon the trunk. It may be attended with loss of appetite, diarrhœa, and anæmia. It lasts a week or ten days.

Another form, described by Schonlein, is characterized by a multiple arthritis. The eruption varies in appearance; it may be purpuric, urticariaus, or erythematous. It is most common between the ages of twenty and thirty. It sets in with a sore throat, fever from 101° to 104°, and pains in the limbs and joints. There is some cutaneous œdema. The wheals, purpuric spots, and nodosities may all appear together. The nodes are very painful and sensitive. I once saw this affection attend a rheumatic endocarditis, and I have several times seen it appear during a rheumatic fever.

Osler describes an arthritic purpura which presents marked gastro intestinal and renal symptoms. It is not uncommon, and most frequently occurs in children. It sets in with pain and swelling of the joints. Purpura and urticaria develop about them, and the case looks like one of rheumatic purpura. Soon other symptoms develop; the child has attacks of severe vomiting and diarrhœa, with true gastro-intestinal crises, particularly at night. There may be hemorrhage from the bowels, and renal symptoms, such as albumin, tube casts, blood, and all the symptoms of hemorrhagic nephritis.

Purpura hemorrhagica is a form of very severe purpura with hemorrhage from the mucous membranes. This is sometimes called morbus maculosus. It occurs in young and delicate persons. After a few days of weakness and prostration, purpuric spots appear on the skin, and rapidly increase in numbers and size. Bleeding from

the mucous surface sets in, and the epistaxis, hæmaturia, and hæmoptysis may cause profound anæmia. Death may take place from loss of blood, or from hemorrhage into the brain. There are instances of this disease of such malignancy that death has occurred in twenty-four hours. In the diagnosis of this variety it is important to exclude scurvy. In purpura, however, there is no swelling of the gums.

Treatment.— The treatment of each form must be based on the pathological condition and the peculiar symptoms shown by the patient. We must first, however, ascertain if the environment of the patient has anything to do in causing the diseases. If we find the residence damp, cold, malarial, or if the house is infected with sewer-gas, the patient should be removed, if possible, to better quarters. Without giving the general and special characteristic indications for all the medicines useful, as has been done so admirably by Dr. George W. Winterburn in his "Monograph on Purpura" (published in 1886), I will point out the remedies for the various forms.

In the symptomatic or infectious: Baptisia, arsenic, rhus, ailanthus, lachesis, crotalus, turpentine, phosphorus, arnica, sulphuric acid, bryonia, and eucalyptus.

In the cachectic: Secale, cinchona, ferrum muriaticum, arsenic, arseniate of iron, arseniate of quinine, mercurius corrosivus, and arsenite of copper.

In the neurotic: Secale, ustilago, phosphorus, arnica, strychnia, arsenic, and the arseniates of quinine, strychnia and copper, cicuta, apis, chloral, belladonna, hyoscyamus, antipyrin, and phenacetine.

In the arthritic variety I have found arnica and ledum the most successful medicines. They correspond closely to the symptoms and conditions which prevail in nearly all cases. I treated one case successfully with manaca (francisca uniflora), when the patient had the sensation of an iron band around the head, with intense soreness of the joints, and erythematous nodes. Salicylate of soda in small doses, one or two grains every two hours, has been useful in several cases. Rhus and bryonia may be of value in cases which seem to call for their use, but I have rarely found them so. In the purpura simplex of children, I find phenacetine, ledum, apis, and arnica most

useful. Osler makes the remarkable statement that "in the simple purpura of children, or that associated with slight articular trouble, arsenic in full doses should be given. No good is obtained from small doses, but the Fowler's solution should be prescribed freely until its physiological effects are obtained." Arsenic is homeopathic to purpura, but its purpuric symptoms indicate it only in the cachectic, infectious, and hemorrhagic varieties. Winterburn records no cases of the arthritic variety cured by it. I do not doubt Osler's experience, but I cannot imagine why arsenic acts so favorably in such cases and in such toxic doses. On the other hand, I can see how it may act curatively in small doses in the arthritic purpura in children with gastro-intestinal and renal complications, because it seems perfectly homeopathic to that group of symptoms. I am certain, however, that in this form arsenic could not be safely pushed until its physiological effects appeared. The 3x or 6x will doubtless be strong enough.

Purpura hemorrhagica should be treated by phosphorus, secale, carbo. veg., turpentine, erigeron, thaspi, sulphuric acid, hamamelis, hydrastis, chloral, and the serpent poisons.

Turpentine and sulphuric acid were useful in the four cases that I have treated,—all the patients recovered. Turpentine was prescribed in the 1x, ten drops every two hours; dilute sulphuric acid in doses of five drops every two hours. The diet during the treatment should be very sustaining,— buttermilk, koumiss, beef extracts, lemonade with white of egg, port wine jelly, malted milk, orange and lemon juice, and clam broth; alcohol should be avoided, as should all malt liquors.

There is doubtless some value in topical applications to the surface when the purpuric spots bleed. Arnica and hamamelis, a ten or twenty per cent solution, applied constantly, will in my experience prevent the oozing hemorrhage. Hydrastis, owing to its specific influence over the coats of the arterioles and capillary vessels, should make a good local application — a ten per cent solution is of sufficient strength. The distilled extracts of arnica and hamamelis can be used. I have never tried the white hydrastis solution, but believe it will be useful in this disease. Antipyrin is recommended as a topical application.

HÆMOPHILIA.

Definition.— A constitutional disease, generally hereditary, with a tendency to uncontrollable bleeding, which may occur spontaneously or from slight wounds. Those who desire to consult copious authorities are referred to the writings of Buel, Hay, Coates, Legg, and Grandidier. They assert the family nature of the disease, but admit that the fault may be acquired, though they say "nothing is known of the conditions under which the disease may arise in healthy stock." Some instances of the hereditary transmission of the disease are remarkable. It has been known to occur in the sixth and seventh generations. The usual mode of transmission is through the mother, who is not herself a "bleeder," but the daughter of one. Males are more often affected then females, the proportion being as high as 11 to 1 or 13 to 1. The tendency usually appears as early as the first two years of life. Condition in life does not modify the tendency; the families of "bleeders" are large, they look healthy, and have fine soft skins. No special morbid anatomy has been found that throws any light on the nature of the disease; there must be some peculiar undiscovered frailty of the blood-vessels, or some peculiarity in the constitution of the blood, which prevents the normal thrombus-formation in the wound. The victims may bleed externally and internally; spontaneously, or from some injury. The following is in the order of frequency of the hemorrhages as to location: nose, mouth, stomach, bowels, urethra, lungs, tongue, vulva, ear, navel, fingers. The bleeding is a capillary oozing, and may last for hours or days. Epistaxis may prove fatal in twenty-four hours; the blood seems to lose the power of coagulation. The joints may be affected in a singular manner; they are attacked by pain and swelling, and simulate rheumatism, but this condition is due to hemorrhage into the joint.

Diagnosis.— Hæmophilia should not be confounded with purpura. One uncontrollable hemorrhage in a person should not be pronounced hæmophilia; it is only when repeated intractable hemorrhages occur, and a family tendency is traceable.

Prognosis.— Death rarely occurs from a first bleeding. The younger the patient, the worse the prognosis. The longer he sur-

vives the repeated attacks, the better his chance of outliving the tendency.

Treatment.— The most radical treatment would be forbidding the daughters to marry, as it is through them the disease is transmitted. The boys of a bleeding family should be guarded against injury of all kinds, even in early infancy. When an injury has been received, absolute rest should be enforced, and compression with lint saturated with hamamelis, hydrastis, arnica, aromatic vinegar, or a solution of muriate of baryta. The lint should not be allowed to get dry, and when removed it should be done with great care. Internally, ergot is reported to have cured several cases; also the perchloride of iron ("thirty drops every two hours," Dr. Legg).

I have treated a few cases, with no deaths. Besides the compresses mentioned, I gave internally lachesis sixth, phosphorus sixth, and hamamelis mother tincture (twenty drops every two hours in one case.) Turpentine, erigeron, thaspi, crotalus, ustilago, trillium, and millefolium may be tried, but I cannot personally recommend them.

In dangerous hemorrhages during the menses, as reported by Townsend and Vickery ("Boston Medical and Surgical Journal"), I should advise packing the vagina with styptic cotton or injecting compound tincture of iodine into the womb. A case of bleeding (into the bladder) from the right ureter is reported by Senator, of Berlin. It was so persistent that he removed the right kidney, "after which the bleeding ceased, and has not returned."

SCURVY (Scorbutus).

Definition.—Scurvy is a constitutional disease, the chief characteristics being great debility, with anæmia, a spongy condition of the gums, and a tendency to hemorrhage.

This disease develops whenever individuals have subsisted for prolonged periods upon a diet in which fresh vegetables or their substitutes are lacking. It is now a very rare disease, owing to the modern methods of canning and preserving vegetables, so that ocean vessels and armies are now freely supplied with them. Other factors besides the absence of fresh vegetables, with their malic, citric, and lactic acids, may tend to produce this disease. Physical and moral

influences, such as over-crowding, dwelling in cold damp quarters, prolonged fatigue under depressing influences, as during the retreat of an army, and the profound mental depression of prisoners. Homesickness may cause scurvy.

Symptoms.—Early symptoms are loss in weight, weakness, and pallor. The gums become swollen and bleed easily, and sometimes present a fungous appearance. The teeth may become loose and fall out. The breath is very offensive. The salivary glands may be enlarged. The skin becomes dry and rough, and ecchymoses soon appear, first on the legs, then on the arms and trunk. In severe cases there may be effusion between the periosteum and bone, forming irregular nodes, which in bad cases break down and become ulcers. The slightest bruise or scratch causes hemorrhage. Œdema about the ankles occurs. Epistaxis is common, and other hemorrhages may occur. The heart's action is feeble and irregular; the temperature higher than normal.

Treatment.— Medicines are rarely required, except when mental or moral causes help to bring on the disease. The free use of lemon and lime juice, or eating freely of any acid fruit, with plenty of fresh vegetables, rarely fails to effect a cure. If the improvement is slow, however, it may be aided by the use of mercurius, nitric acid, aurum muriate, phytolacca, corydalis, and other remedies having homeopathic relation to the pathological condition. The mental depression may be benefited by aurum, ignatia, anacardium, cimicifuga, and others. When the stomach is very sensitive, scraped fresh raw meat, with milk, is beneficial. As the digestion becomes stronger, watercresses, lettuce, greens, and potatoes are permitted. Mouth-washes of a very weak solution of carbolic acid, boracic acid, or permanganate of potash can be used to advantage. Sulphuric acid, thaspi, and turpentine are the chief remedies for the various hemorrhages.

INFANTILE SCURVY.

This form of scurvy is more common than is supposed, and is often not recognized until too late. It occurs in infants and young children fed upon improper food. It develops a cachexia, which has been mistaken for acute rickets, but which Cheadle and Barlow have shown to be a form of scurvy. The most striking cases develop in

infants reared on artificial food prepared with water, though the disease has occurred when these foods were prepared with milk. Rickets strongly predispose to the condition. The cases may occur in infants, or in children up to the age of ten. Barlow thus summarizes the chief features:

"(1) Predominance of lower limb affections: (a) immobility, going on to pseudo-paralysis; (b) skin shiny and tense, but seldom pitting, and not characterized by undue local heat; (c) on subsidence, revealing a deep thickening of the shaft; (d) liability to fracture near the epiphyses. (2) Swelling of the gums varying from definite sponginess down to a vanishing-point of minute transient ecchymoses; these constitute the chief diagnostic differentia between infantile scurvy and rickets, properly so-called; but to them must be added, as the most important diagnostic of all: (3) Definite and rapid amelioration by antiscorbutic regimen."

According to Gee, hæmaturia may be the only sign of scurvy in children. Dr. Mayo, in "Merck's Bulletin," relates the following typical case:

"I was called to see Dr. S.'s child, twenty months old, on July 12, 1891. He had not been sick, but puny since January before; his skin had a dark unhealthy appearance, as if slight venous congestion had set in. About the 4th or 5th of July he commenced complaining of pain in the right thigh, supposed to have been hurt by the nurse; he could not use that leg, and cried if it was touched; gums much swollen, and of the color of dark venous blood. Wherever he was bitten by an insect, or pricked with a pin, the puncture turned black instead of red. Had 'cut' sixteen teeth without much trouble; on examination of the mouth, only three of them were visible, the rest covered by the swelling. Had never had trouble, of any consequence, with the bowels. Had been under medical surveillance since January, but had during that time retrograded. The parents' anxiety about the child's leg made them send for me. Upon examining the mouth, I passed a lancet through the swollen gums, and could feel no more resistance to the lancet than would have been felt in passing through a blood-clot, though there was a visible, organized membrane over the dark venous blood. Pulse and temperature normal; thought the latter a little below the natural standard, but was not certain, as the restlessness of the child made the

application of my thermometer quite difficult. I examined the thigh, but could find no evidence of injury or disease, except the pain. The father thought there might be dislocation of the hip joint; but, as there was no evidence of it, I denied it. The diagnosis was to my mind obscure, but I was inclined to think it purpura. I ordered an astringent mouth-wash, and turpentine internally. After a night's reflection and the examination of authorities on children, I concluded it was not purpura, but must be scurvy (with which I had before been familiar, in California, 1849-50). There was no such title in any work on children in my possession, and as children in our country are usually fed on milk (an antiscorbutic), I could not account for my diagnosis. Upon inquiry, next morning, I found this child had been reared exclusively on Reed & Carnrick's 'soluble food.' I gave him no medicine, ordered fruits and lemonade, salad made of scraped raw Irish potatoes, seasoned with lemon juice and sugar; no treatment to the leg; mouth-wash continued; and milk to be substituted for the Reed & Carnrick's 'soluble food.' (The last direction was not carried out to the letter, as the child fretted for its accustomed food; the remainder of the prescription was strictly obeyed.) The child improved in health and flesh immediately, and in three weeks was running about, free from all pain, with only a little sponginess of the gums, which in two months were perfectly well, with teeth healthy, firm, and white. He had not taken a dose of medicine, and continues healthy up to date."

Dr. James McManus (in the "Medical Record") recently reported a case of scurvy in a child of twenty months which had been fed on condensed milk alone. It had a dark, grumous diarrhœa, swollen and bleeding gums, and ecchymoses on the legs. The diet was changed to fresh cow's-milk, beef, orange juice, and lemonade. All the scorbutic symptoms disappeared in a week.

Dr. Carr reports in the same journal a case which shows the paralytic symptoms which may occur: "V. R. K——, female, aged fifteen months; first child. The baby was nursed until she was six weeks of age, when she was weaned, and fed condensed milk for six weeks longer, after which Mellin's food was used. This seemed to agree with her, though at first she did not like it, and the condensed milk was given in its place from time to time. The first lower incisors showed at eight months; the baby stood and walked with assist-

ance two weeks later. During September, 1891, bowel trouble developed, which continued for some months and weakened the baby very much. The diet was kept the same. In November she refused to stand, and when placed on her feet would fall. The following month, December, she became irritable, fretful, and did not sleep well. She appeared to have fever. Her legs were tender and sore, and she kept her thighs drawn up on her abdomen. When her clothing was changed she would scream as if in pain. After this condition had lasted about six weeks, the baby extended her legs, but did not seem able to use them, although they were not so tender. On the legs were streaks and spots which looked like bruises, and in the centre of some of the purpuric patches were reddish dots that resembled pin-pricks. The movements from the bowels were as frequent as sixteen a day, and varied greatly in appearance. Sometimes the stools were green, then were black, or dark green, and again were natural in color. Often they contained a large quantity of mucus and were streaked with blood. May 18, 1892, I first saw the baby, and my attention was called to the weakness of her legs. I found her to be a plump infant, with very little muscular strength, and a great deal of tenderness all over the body, and especially of the thighs. She evidently experienced pain when she was handled, and began to cry before she was touched. The thighs had a swollen appearance, and were sausage-shaped, with some of the swelling below the knees. The lower thirds of the femurs felt thickened, and the thighs were exquisitely tender. There was not any heat in the parts. The sensation was good, but the muscular power was so weakened that the extremities could not be drawn up. There was no staining or discolorations. The abdomen was soft and distended. The liver and spleen were not enlarged. As the baby cried, the gums were seen to be swollen and bleeding, with the teeth half-hidden by the soft alveolar tissue. The tongue was covered with a dirty yellowish-brown coating, and with blood from the gums. The anterior fontanelle was as open as is usually observed at fifteen months. Head moist; no craniotabes; no marked rachitic changes in epiphyses, or along the edges of the flat bones. Examination of the chest showed the presence of mucous rales, some of which at the bases of the lungs were rather fine; but there was no dulness. The temperature in the rectum was almost 105° F. The mother was

ordered to stop the condensed milk, and to give the baby fresh milk, beef juice, and the juice of an orange every day. No medicine except a placebo was prescribed. After the visit of May 18 the baby had the measles, accompanied by a severe attack of bronchitis. The high temperature noted was no doubt due to the onset of the acute disease. Under the change in diet the baby had made rapid improvement, and, although ill with the measles, the gums were better in three days, and normal by the end of a week. June 21 was recorded: 'Baby's general condition good. Some perspiration of the head and body. The muscles are not very strong, and there is a slight curvature of the spine, due to the want of muscular support. There is no tenderness of the thighs. Gums are all right. The stools contain a little mucus.' June 29, the mother sends word that the baby's bowels are much improved, and that she is gaining in strength and weight. She uses her legs and feet better than she had ever done before the illness. The history of the case shows that there were not any puzzling symptoms, and the diagnosis was readily made. I wish to call attention to the two features that were most prominent, and which should be looked for in all cases of the same character. These symptoms were the tumefied bleeding gums, which almost covered the teeth, and the tender, swollen thighs."

To these cases I will add one of my own, which presented some peculiar features. The infant was six months old, was apparently well-nourished, looked fat, but the flesh was soft and flabby, the fontanelle very open. The mother called my attention to the gums, which were a livid red, soft, spongy, and bleeding. This was soon after the child had recovered from an attack of *la grippe*. There was excessive tenderness of the lower limbs, with pain on movement, and some paralysis of the abductor muscles of the feet. The food of the child had been for five months principally granum gruel, mixed with equal parts of milk.

It did not seem to me that the food was deficient in proper materials, but there were the unmistakable symptoms of scurvy. I gave no medicine, but ordered the diet changed to fresh milk alone, mixed with egg albumin, and ordered that the child be fed the juice of one acid orange three times a day. Under this regimen the scorbutic symptoms soon disappeared.

OSTEOMALACIA.

"This lesion consists in the softening of fully-formed hard bone-tissue by the removal of its inorganic salts. It is to be clearly distinguished from rickets, the lesions of which are due to a faulty development of bone, although in certain external characteristics the two diseases sometimes present considerable similarity. Osteomalacia usually occurs in adults, most frequently in females during pregnancy and after parturition; more rarely it occurs in males, and in females unassociated with the above conditions. Its cause is not known. Microscopical examinations show that the decalcification occurs first in the periphery of the haversian canals and in the inner layers of the walls of the marrow spaces. As the salts of lime are removed, the basement substance at first remains as a finely fibrillated material still preserving the original lamellation. The bone-cells may be changed in shape or degenerated. After a time the decalcified tissue may disintegrate and be absorbed, and its place occupied by newly-formed marrow or granulation tissue. As the disease goes on, the marrow tissue is congested and red, the fat absorbed, and there is a great accumulation of small spheroidal cells; or the marrow may assume a gelatinous appearance. The decalcification and absorption of the bone from within may proceed so far that the bony substance in the cancellous tissue almost entirely disappears and the compact bone is reduced to a thin soft decalcified tissue. The disease is not always continuously progressive, but may be subject to temporary cessation. As a result of this softened condition of the bones, the weight of the body and the action of the muscles may induce a series of deformities which are sometimes excessive—curvatures of the spine, complete and incomplete fractures of the bones, distortion of the pelvis, sternum, etc. There is a tendency in this disease to a general involvement of the bones, but the changes are sometimes confined to single bones or groups of bones. The cranium is rarely much affected." ("Therapeutic Gazette.")

Treatment.—Archer (on Gynecology) sums up recent experience as to this disease. He points out facts to show that the disease is not confined to the very poor; nor is it due to prolonged lactation, bad nutrition, damp dwellings, or sour bread. No changes in the

blood have been demonstrated which can explain its origin. It is endemic in certain places, as in the Swiss canton of Basle. It appears to be connected with ovarian activity, and the subjects of it are extraordinarily fertile. He asserts that no treatment cures it with such certainty as removal of the ovaries. Sterilization, without removal of the ovaries, has not the same curative influence. After removal of the ovaries the pain in and tenderness of the limbs, which are marked features of the disease, begin to diminish in a few days. The disease is a tropho-neurosis of the bones, depending chiefly on the ovarian activity. If it occurs in males, as some authors assert, it must be due to abnormal activity of the testes. In such cases their removal would be required.

Hofmeier ("Centralblatt für Gynäkologie," No. 12, 1891) reports the case of a virgin, aged thirty years, who had osteomalacia of three years' standing, the disease being progressive at the time of the operation, as shown by the presence of severe pains in the pelvic bones, inability to walk, and marked pelvic deformity; menstruation regular and painless. Four weeks after the removal of the ovaries the patient could walk without assistance, and the pains were much less severe. She received cod-liver oil and peptonate of iron; six weeks later she felt quite well, had no pain, and could walk a long distance. The pelvic organs were normal.

The ovaries were atrophied, as in a woman after the meno-pause, and presented a similar appearance microscopically, only a few ovisacs being seen. The case was interesting, not only because the patient was a virgin (hence pregnancy could not be regarded as an etiological factor), but there was no disturbance of menstruation, or evidence of pelvic congestion. As regards the effects of castration under such circumstances, the writer admits, with Fehling, that it is impossible to give a satisfactory explanation. It may be due to some reflex action upon the vaso-motor nerves supplying the nutrient vessels of the pelvic bones, the disease itself being regarded as a tropho-neurosis of the bones directly dependent upon ovarian activity. This theory receives additional support from a similar case reported by Truzzi. Fehling has collected twenty other cases of castration for osteomalacia, in none of which was there a failure on the part of the operator to secure at least a temporary benefit. ("American Journal of the Medical Sciences," July, 1891.)

"Zwiefel has already proved that after a Porro's operation in a case of mollities, the bone disease, usually so intractable, may pass away. This result is not invariable after Porro's operation, and when it occurs it is apparently due to the removal of the ovaries. Dr. H. Fehling has recently noted the above facts in the 'Centralblatt für Gynäkologie.' He quotes the favorable experience of Hoffa, P. Muller, and Winckel, and declares that in eight cases, where he himself has removed the appendages in cases of mollities, the results have been excellent. In six of these cases the patients had not borne a child for at least two years before the operation, yet the disease was making active progress, and preventing the patient from working for her bread or enjoying life. In most of the cases the arrest of the mollities was very rapid; in the remainder the improvement set in slowly, but continued steadily after the operation. These results, in Dr. Fehling's opinion, appear to justify the theory that it is the suppression of the functions of the ovaries that brings about the cure of mollities after the extirpation of those organs. Why such a phenomenon should occur Dr. Fehling does not explain; but if his theory be correct we have a new physiological truth of great importance. The bones, in respect to their red marrow, are known to be blood organs; now it appears that the ovaries are, at least under certain conditions, bone-controlling organs." ("British Medical Journal," July 28, 1890.)

There must be, according to some bacteriologists, a microbe peculiar to every disease. The following seems to imply that the microbe of mollities has been discovered:

Starting with the hypothesis that osteomalacia is an infectious disease due to the presence of the microbe of nitrogenous fermentation, and resting, on the other hand, on the researches of Schlosing, Muntz, and Warrington, according to whom chloroform rapidly destroys the vitality of the nitrogenous ferment, Dr. M. Petrone, of Naples, conceived the idea of treating a case of osteomalacia with chloral hydrate, which, as is known, gives off chloroform when in the presence of the alkaline fluids of the body.

"The patient was a woman of fifty. The trunk was a shapeless mass; the vertebral column was deflected, twisted, and arched forward. The woman's height was reduced to 1.3 metres (four feet three inches), while before the disease it measured 1.57 metres (five

feet two inches). The abdomen was very prominent, and there was a large hernia of the linear alba. The pelvis offered the characteristic deformities of osteomalacia. The bones of the face and cranium presented nothing abnormal. The patient experienced continuous violent spontaneous pains in the bones, increasing with pressure. Walking and even the upright posture was impossible; the slightest movement to change the position in bed provoked terrible pains. Besides all this the patient was tormented by a very annoying cough occurring in paroxysms, as well as by an incessant hiccough. The urine contained neither albumin nor sugar, but traces of propeptone and a notable quantity of nitrous acid.

"Dr. Petrone instituted the treatment with chloral hydrate, in doses of two grammes (thirty grains) a day, in solution. In three days, it is reported, the pains had considerably diminished, and in the urine the propeptones had completely disappeared and there was a notable diminution of the nitrous acid. On the fifth day of the treatment the urine had become normal. Toward the end of the first week the patient could get up, dress herself all alone, and make a few steps without any support. The spontaneous pains had almost completely disappeared, the hiccough had vanished, and the annoying cough was improved. At the end of a fortnight the patient could be considered as cured; still the treatment was continued for a week longer, making in all three weeks of medication. At the date of this report there was no longer, it is stated, the slightest osseous pain, either spontaneous or provokable by pressure; the patient could walk, go up and down stairs, attend to her domestic duties, and freely and without pain execute all the movements which her osseous deformities permitted of making. The cure appeared to be complete, and ascribable to the chloral, that is to say, to the chloroform set free by this medicament in the organism. The author even considers the several recorded cures of osteomalacia after ovarian castration due to the chloroform used for the production of the anæsthesia in the operation."

In the above case the chloral may have cured by inhibiting the functional activity of the ovaries. If Fehling's theory be true, and it seems probable, there are medicines which should be used as palliatives, whose effects are to diminish ovarian and testicular activity — conium, iodine, bromine, baryta, morphine, salix niger in large

doses; but the objection to their continued use is, that the general vitality of the system would be so much depressed that their effects could not safely be pushed to the point of causing atrophy of the ovaries, and even this might not cure.

No clinical reports of cures of this disease are to be found in our literature. Raue recommends calc. carb., calc. phos., fluoric acid, and silica under the old theory that the disease is caused by a deficiency of the lime salts in the blood. Such remedies are not indicated. Only those are indicated that act through the sympathetic nervous system.

If we select remedies homeopathic to abnormal ovarian activity, they are aurum, murex, platina, asafœtida, sabal serrulata, phosphorus, turnera, and other aphrodisiacs in minute doses (3x to 12x).

RICKETS.

[I have quoted freely from the great work of Dr. Eustace Smith, on "Diseases of Children,"* because of the excellent manner in which the symptoms are there presented.]

Definition.—"A constitutional diathesis, which impairs the nutrition of the whole body. Under its influence, growth and development are arrested, dentition is retarded, the bones soften and become deformed, the muscles and ligaments waste, and in fatal cases alterations are often noticed in the brain, liver, spleen, and lymphatic glands. The disease usually begins in infancy. It is rare under the age of six months, for it seems very doubtful if the cases of so-called congenital rickets are true examples of the disease. At the eighth month, however, it begins to be common, and from that age until the eighteenth month may be readily set up under the influence of causes which interfere with digestion and impede the assimilation of food. It is less common for the disease to develop in children who have been in good health up to the age of eighteen months, but it may occur at any time between that age and the seventh year, or even in still older subjects. Although beginning at a very early age, the disease often continues for several years, and may be seen existing in a marked degree in children three or four years old.

* William Wood & Co., New York.

Causes.—"Rickets is the direct consequence of mal-nutrition in early life. Its causes must therefore be looked for in all the diverse agencies which impair the nutrition of the growing frame. The most important of these are, no doubt, faults of feeding and hygiene. Insufficient or unsuitable food stints the body of necessary nourishment, and an inadequate supply of fresh air renders assimilation defective and weakens digestive power. These two causes are most commonly found united in the poorer quarters of large cities. An infant who lives amongst other children in one small room, where it breathes a tainted air, and derives its only nourishment from the watery breast-milk of a weakly mother, with the addition, perhaps, of a little gruel or sopped bread to quiet it when it cries, can only escape rickets by becoming tubercular. By such means an extreme degree of the malady will probably be produced. But similar agencies, although operating in milder form, will produce rickets in any condition of life. It is not uncommon to meet with examples of the disease in well-to-do families where the child has been kept in-doors for fear of his catching cold, and has been supplied with farinaceous compounds largely beyond his power of digestion. Over-feeding with starch food is a fruitful cause of rickets. The giving of farinaceous matters in excess, or at a time when the glandular secretions are insufficient for its digestion, is the commonest fault committed in the hand-feeding of infants. Dr. Buchanan Baxter, who tabulated 120 consecutive cases of rickets, found that in many of them the disease dated from the time when farinaceous food was first given. It is probable that in these cases the occurrence of mal-nutrition and subsequent rickets is due not so much to the excess of starch as to the absence of the more nutritious food for which the starch has been substituted. Rickety children so fed are often fat, and do not, to the inexperienced eye, convey the impression of being under-nourished. Examination, however, discovers that they are weak, often excessively feeble; and it is evident that the plumpness of the child is due to disproportionate development of the subcutaneous fat. This tissue has been enormously over-nourished, while the rest of the body has been stinted and starved.

"The time of weaning is often a starting-point for rickets, for the breast-milk is usually replaced by some preparation of starch. So, also, long-continued suckling may induce the disease, for the breast-

milk after a time ceases to satisfy the infant's wants, and too little additional nourishment is supplied. Therefore, whether the food given be insufficient in amount or indigestible in form, the effect is the same: the child is starved, and rickets become developed.

"In cases where the child lives in a good bracing air, the effects of an unsuitable dietary are less painfully evident. In dry country places, where the infant spends much of his time out-of-doors, rickets is a more uncommon disease than it is in localities where the conditions are less favorable to health; want of sunlight, want of cleanliness, and a combination of cold and damp, are other determining causes which are not without their influence in the production of rickets. All these causes must, no doubt, act with especial energy in the case of infants who are naturally weakly, or whose strength has been already reduced by some exhausting disease. There are, therefore, many conditions which predispose to the complaint. Feebleness of constitution on the part of the parents will, no doubt, have an influence in this respect, for weakly parents are not likely to beget constitutionally healthy children. Moreover, a weakly mother is usually unable to nurse her baby; and hand-feeding, unless conducted with extreme care and discretion, is often unsatisfactory. A very large proportion of rickety infants are bottle-fed."

Symptoms.—"As might be expected in a disease which arises as a direct consequence of faulty nutrition, the symptoms proper to rickets are usually preceded by others indicating a general interference with the nutritive processes. Digestive derangements are common, but these comparatively seldom consist in attacks of severe or repeated vomiting or diarrhœa. In most cases the derangement is limited to a lessening of digestive power, so that the motions, without being actually loose, are more frequent than natural. They are large, pasty-looking, and offensive from the quantity of farinaceous and curdy matters which are passing undigested out of the body. At this time the child is often irritable and fretful. His belly may be swollen from flatulent distention, and he frequently cries with pains in the abdomen. For this reason he may be often found asleep in his cot resting on his chest, or supported on his knees and elbows, with his head buried in the pillow. The urine is often acid, and causes uneasiness in micturition. If the child perspires copiously, the renal secretion may contain considerable quantities of uric acid sand."

"Unless, by judicious treatment and diet, the alimentary canal be restored to a healthy state, the child, although often still plump to the eye, becomes pale and flabby. Then, after an interval which varies in duration according to the natural strength of the patient and the more or less wholesomeness of his surroundings, the early symptoms are noticed. The onset of the disease is announced by three special symptoms. The child begins to sweat about the head and neck; he throws off his coverings at night, and lies naked in his cot; and begins shortly afterwards to exhibit uneasiness if much danced about in his nurse's arms, or handled without the utmost gentleness.

"The sweating is profuse and occurs principally during sleep. At night, beads of moisture may be seen standing on his brows, and the sweat trickles off his head onto the pillow, which is often saturated by the secretion. If the child falls asleep in daytime, or even if he exerts himself much while awake, the same phenomenon may be noticed. The irritation of this perspiration often gives rise to a crop of miliaria about the neck, behind the ears, and on the forehead. The superficial veins of the temples are full, the jugular veins are unusually visible, and the carotid arteries may be felt to pulsate strongly.

"The desire of the child to lie cool at night comes on almost at the same time with the preceding, and may be observed in the coldest weather. It is, indeed, a frequent cause of catarrh in these patients, and I have seen many cases in which continued looseness of the bowels was apparently maintained by repeated chills so contracted. For the same reason a frequent cough from pulmonary catarrh is a common symptom.

"General tenderness usually begins to be noticed at a certain interval after the two other symptoms which have been mentioned. It is shown by unusual sensitiveness to even slight pressure, and appears to be seated in the muscles as well as in the bones. The child cries if lifted up at all abruptly or subjected to a jolt or jar, and prefers to lie quietly in his cot or in the lap of his nurse. This symptom seldom occurs until the osseous changes are well marked. It is accompanied by uneasiness or pain about the head, which is indicated by a monotonous movement of the head from side to side upon the pillow. The hair covering the occiput is often worn away by this constant movement, and the bareness of the back of the scalp

from this cause is a very characteristic symptom. Tenderness is not always noticed. It is usually confined to cases where the disease is severe. In the mild cases, which are shown merely by a slight enlargement of the wrists and ankles, without any apparent softening of the bones, the symptom is usually absent.

"In a pronounced case of rickets, the effect of the bone lesion is very striking and peculiar. The skull is large, with a long anterio-posterior diameter, and often, on account of the comparatively small size of the face, looks larger than it really is. The forehead is square from exaggeration of the bosses of the frontal bones, and is sometimes very prominent from the development in the bone of cellular cavities. The fontanelle is large and remains open long after the end of the second year. Sometimes, if the size of the brain is increased, or there is excess of fluid in the skull cavity, the sutures in connection with the fontanelle can be felt to be more or less distinctly gaping. On account of the thickening of the edges of the flat bones the margins of the sutures and fontanelle are elevated, so that the latter feel depressed and the sutures are indicated by furrows. The posterior fontanelle has usually disappeared before the beginning of the illness, but in extreme cases, where the disease began early and the symptoms are pronounced, it may be felt to be still unclosed.

"The chest is deformed in a very characteristic manner, on account of the inability of the softened ribs to resist the pressure of the atmosphere. Under normal conditions, when the ribs rise and the chest expands in the act of inspiration, the solid framework of the thorax is able to withstand the pressure of the expired air, and the chest easily enlarges to allow of inflation of the lungs. Air rushes through the windpipe to dilate the pulmonary tissue in proportion as the chest-walls expand. In the rickety chest, on the contrary, the ribs are not firm but yielding. Consequently the framework of the thorax is not rigid enough to resist the pressure of the air from without, and when the effort is made to expand the chest the softened ribs are forced in at the sides, the parts where they are least supported. This sinking-in of the ribs throws the sternum forwards. We therefore find the chest grooved laterally and the breast-bone prominent and sharp.

"The spine is often bent. In an infant the cervical curve is

increased so that the head is supported with difficulty and falls backward upon the shoulders, producing a very characteristic attitude. Also, the weight of the head and shoulders, as the child sits bending forward, causes a projection backward of the dorsal and lumbar spines, which is sometimes so sharp as to give the appearance of vertebral caries. The deformity, however, subsides completely when the child is taken up under the arms and the spine is drawn upon by the weight of the limbs and pelvis. If the patient is able to walk, there is an increase in the lumbar and dorsal curves. The curvatures may be lateral. If the child is carried habitually on his nurse's left arm, the trunk sways over to the right; if on the right arm, the body leans to the left. In all these cases the deformity is due to weakness of the ligaments and muscles. The bones forming the pelvis may be also deformed, and sometimes, like the chest, are greatly distorted."

Complications.—"It is not often that a case of rickets remains uncomplicated by some intercurrent complaint. The subject of a pronounced form of rickets has but little resisting power, and is readily affected by any kind of injurious influence. But he is, in addition, peculiarly liable to certain forms of derangement on account of the special tendencies of the phase of mal-nutrition. The sensitiveness to chills manifested by a rickety child has been already remarked upon. This proneness to catarrh may be the consequence of the profuse and ready action of the sweat-glands, and it is no doubt encouraged by the child's practice, when his perspirations begin, of throwing off the coverings of his bed. The various forms of catarrh are therefore especially liable to occur, and pulmonary and intestinal catarrhs are the most frequent of these derangements. Few rickety children are without a cough, and this symptom, on account of the unnatural flexibility of their chest-walls, must be always regarded with anxiety. More or less intestinal catarrh is a common derangement in this disease, and after any unusual exposure the looseness of the bowels may pass into a severe attack of purging. Diarrhœa, on account of the great general weakness, is a source of extreme danger, and during the changeable seasons of the year many children are carried off by this complaint.

"Another peculiarity of the rickety state is the curious impressibility of the nervous system, which manifests itself by the ready

occurrence of various forms of spasm. Reflex convulsions are common, and laryngismus stridulus is practically confined to the subjects of rickets. Catarrh of the larnyx is also liable to be accompanied by spasm, and therefore catarrhal croup (laryngitis stridulosa), as is elsewhere stated, is a frequent cause of anxiety."

Diagnosis.—"In a mild case of rickets, the prominent features are the swelling of the epiphysisal ends of the long bones, the tardy eruption of the teeth, and the backwardness in learning to walk. If we notice the wrists to be large in a young child, we should at once count the number of his teeth and ask if he can stand alone. If a child ten months old shows no sign of a tooth, if his wrists are large, and if, when held upon his feet, his limbs double up helplessly beneath him, there can be little doubt that he is the subject of rickets. Even before the swelling of the articular ends of the bones has come on, the onset of the disease may be suspected. Big, fat, flabby infants are generally slightly rickety, and if a child sweats profusely about the head, and is kept covered at night only with great difficulty, we can have but little doubt that the characteristic signs of rickets are about to appear. In such a case, attention should be at once directed to the child's diet, the regularity with which he is taken out-of-doors, and the state as to ventilation of his sleeping-room, so that any errors in management may be promptly corrected. In a marked case of rickets, the deformity of the chest, the bending of the bones, the enlargement of the joints, and bending of the ribs are sufficiently characteristic. Even the position of the patient, as he sits with his legs crossed and his head fallen back between the shoulders, supporting his feeble spine by his hands placed before him on the floor, enables us at once to recognize the case as one of well-defined rickets. The complete uselessness of the lower limbs in many of these cases is often a serious anxiety, even to parents who regard the other symptoms with comparative indifference, for they fear lest the child should be 'going to be paralyzed.' But although the patient has no idea of even placing his feet upon the ground, and cries bitterly when any attempt is made to persuade him to do so, power of movement of the legs is unimpaired. If the skin of the legs be pinched or gently pricked, he at once draws his limbs out of the way."

Prognosis.—"Rickets is not a fatal disease in itself unless the bony change be far advanced, nor even in such a case does death

often ensue except as a consequence of some catarrhal complication. As a rule, improvement begins directly measures are taken to amend the unwholesome conditions in which the patient is living. The dangers of pulmonary catarrh and atelectasis in a child with great deformity of chest are elsewhere referred to; and the serious consequences which may result from diarrhœa in an infant reduced to a state of serious weakness by chronic mal-nutrition need not be insisted upon. Of the nervous complications, laryngismus stridulus is sometimes a cause of sudden death, but reflex convulsions, excited by some trifling irritant, rarely have any ill results."

Treatment.—"In every case of rickets, our first care should be not to give cod-liver oil or tonics, but to inquire into the conditions in which the child is living; to ask about the food he is taking, the quantity allowed for each meal, the frequency with which the meals are repeated, and the degree of cleanliness of the feeding apparatus. We should then turn to the subject of his clothing, the ventilation of his bedroom, and the number of hours he is passing out of doors. The real treatment consists in attention to all these important matters, and not solely in the administration of any particular drug. Medicines are no doubt useful with that of a reformation of the unwholesome conditions under which the failure in nutrition has taken place.

"Plenty of fresh air should be insisted upon. The child, warmly clad, should be sent out in all suitable weather, and if care be taken that his feet are well warmed before he leaves the house there will be little danger of his catching cold. If the patient has reached the age of eight or ten months, he should be carefully packed with cushions in a perambulator and in cold weather should always have a hot bottle at his feet while out of doors. The ventilation of his sleeping-room must be attended to. A small fire in the winter, and a lamp placed in the fender during the summer months, will insure a sufficient circulation of air through the bed-chamber. Both the patient and his immediate surroundings must be kept scrupulously clean. Every morning the whole body should receive a thorough washing with soap and water, and be well sponged in the evening before the child is put in his cot. On account of the copious perspiration, his body linen, as well as that belonging to his cot, soon becomes saturated with moisture. His underclothing should therefore be changed

as often as is necessary. Every morning, too, his mattress and bed-coverings must be thoroughly exposed to the air. The sheets also should be changed frequently and be carefully aired."

The homeopathic treatment of rickets by means of medicines does not show any brilliant success, unless it is attended by the hygienic and dietetic measures advised by Dr. Eustace Smith. I do not advise washing the child with soap and water unless the skin is well rubbed with some penetrating fat, like pure lard, fresh butter, or cod-liver oil. It should be made to eat fat in some form. Few children will refuse butter or bacon if mixed with their starchy food.

Dr. J. Oscoe Chase in the "Homeopathic Journal of Obstetrics" for July, 1892, says: "In the matter of treatment, we must have, in the first place, due regard for the hygienic surroundings and dietetic treatment. The child suffering from rickets in the acute stage requires albuminous and fatty foods in the most concentrated and easily digested forms, while saccharine and starchy foods must be avoided, or be taken in the most moderate quantities. In regard to the therapeutic action of drugs, the specific salts, especially in bone disease, must be given low. It has been proven that prolonged doses of phosphorus, and to some extent lactic acid, will produce rickets or osteomalacia; thus we have a scientific basis to work upon, and the large number cured from phosphorus shows that the law of similia is the most applicable. Jacobi says that 'minute doses of phosphorus renders the newly-formed tissue at the point of opposition of the bones more compact in a very brief time.' Wagner, twenty years ago, demonstrated this by his experiments on animals, which has since been confirmed by Kasowitz, of Vienna. The latter reported 560 cases of rickets, in which he gave phosphorus, 1-126 of a grain two or three times a day, resulting in the skull becoming harder, the fontanelle smaller, the softening of the bones of the thorax and extremities to disappear, and all the other symptoms of rachitis to improve. Others of our allopathic brethren say that even smaller doses of phosphorus are just as beneficial. Mandelstamm used phosphorus in 216 cases of rickets. In 120 a complete cure was affected, and 43 were improved. The duration of treatment was from one month to one year, and the remedy was administered in a simple emulsion or with cod-liver oil. From the various sources that I have been able to consult, and with what experience I have gained,

the best remedies for rachitis are the salts of lime, soda, and potash, with their compounds. Calcarea phos. stands preëminently at the head, and with calcarea flor., calcarea sulph., and phosphorus, we have our sheet anchor in diseases of the bones and connective tissues. Ferrum phos., for affections of the blood and muscles; kali mur., for the mucous membrane; kali phos., for atrophic conditions; kali sulph., for skin affections; magnesia phos., for functional and nervous disorders; natrum mur., in cartilaginous changes; natrum phos., for increased acidity of the digestive organs; natrum sulph., for increase in serum; and silicea in glandular and suppurative disturbances."

Other writers of our school recommend the following:

Calcarea phos.— In delicate children caused by soft sponginess of the bone from want of phosphate of lime molecules. "Skull soft and thin, with crackling noise when pressed upon, delayed closures of fontanelles, sallow, earthy complexion, face pimpled, retarded dentition, emaciation, lateral curvature, swollen condyles in both extremities, spina bifida, non-union of broken bones, systemic dyscrasias, Pott's disease, shrunken children, hard lumps on the cranium, diarrhœa during dentition with much flatus, cold tremors, child cannot hold head upright." Its principal indications are the fontanelles, which remain wide open, the diarrhœa, and emaciation of the child.

Kali phos.— Atrophy of the bones, with putrid smelling discharges from the bowels.

Natrum mur.— Particularly useful when the thighs are notably emaciated and the disease in its early stages, with slight pliability of the bones.

Silicea.— Open fontanelles, head too large and rest of the body emaciated, with pale face; abdomen swollen, hot; ankles weak; profuse head-sweat and body dry; likes wrapping up warmly; offensive diarrhœa, stools contain undigested food, with great exhaustion, but painless; inflammation, swelling and suppuration of glands and bones; ulceration and necrosis; cellular inflammations; boils, abscesses, etc., with tardy recovery and subsequent induration.

Dr. Knuppel, of Madgeburg, reports (Allg. Hom. Zeit., p. 4) cases where formerly children had been born rachitic, exhibition of calcarea phos. during last months of pregnancy had entirely prevented it, and children were born healthy.

I have found the muriate of lime, in appreciable doses, the most efficient. I usually prescribe it in a syrup made of glycerine and water (one-half of each), each drachm containing one grain, and three teaspoonfuls to be given each day.

FURUNCLE.

Definition.—A boil is an intense inflammation, occupying, within a well-defined area, the entire thickness of the skin (inclusive of the sub-cutaneous tissue), and attended almost always with circumscribed suppuration and formation of slough. Boils may appear singly or in crops, or follow each other in succession. The first indication is a small induration of the skin, which is tender to the touch. It increases in size for several days, when it presents a circumscribed suppurative centre called a "core." The pain is throbbing, deep-seated, and worse at night. It is distinguished from carbuncle by its small size, pointed shape, and single centre. Boils are not always caused by a "low depraved state of the system," as some assert. They are not absent in robust health. Young persons are especially liable to them, while the carbuncle is more apt to occur after middle life.

Treatment.—Arnica and bellis perennis are indicated in all simple furunculi. They should be applied locally in mild cases, a five per cent solution, and given in doses of a drop of the tincture every three hours. It is said that phytolacca, lycopodium, and hepar sulphur will prevent their frequent recurrence. If a stinging pain marks their access, apis may abort it. When suppuration is impending, hepar sulphur 2x may arrest it or prevent extensive sloughing.

Arctium lappa (burdock) is an old remedy for chronic recurrence of boils. I have verified its value in many cases by giving it in doses of ten to fifteen drops of the tincture, three times a day for weeks or months. Berberis aqui. has the same reputation. The water of sulphur springs has been of great value in this diathesis. Many cases which had resisted all medicines, diet, and hygiene, have been cured by a regular use of such waters as the Avon in New York, the Delaware in Ohio, or the French Lick and Baden in Indiana. The two last mentioned springs have attained a wide and deserved popularity. A few weeks' residence at the springs, drinking the water (not in excess), has cured the most inveterate cases.

Many methods have been recommended for the abortion of boils. An ointment of nitrate of mercury is highly praised. Pure benzine, applied on cotton frequently, only a minute at a time, is said to be effectual. As in erysipelas, the aim of the abortive, or any treatment, is to destroy the pyogenic coccus. It has always seemed to me that external applications were about as illogical as throwing water on the roof of a house to put out a fire in the basement. We should aim to reach the nucleus or focus. I used at first a five per cent solution of carbolic acid, but it was not strong enough. Afterwards I increased the strength until I used a fifty per cent solution. This, if injected into the centre of the nodule, before necrosis has taken place, will with absolute certainty prevent further progress. Not more than two or three drops is necessary. It causes very little pain, and that only when the needle penetrates the skin. When a pustule has appeared at the apex, showing beginning of suppuration in the centre, more should be used,— ten to fifteen minims. After the injection, press on the swelling, in order to diffuse the carbolic acid. I have often used the ninety-five per cent solution, with no bad results. When the core has formed or has been expelled, a fifty per cent solution injected into the cavity prevents the migration of the cocci into the surrounding tissues. If, however, small red nodules have formed adjacent to the original boil, each one should be injected with carbolic acid. I would suggest a trial of methyl violet (pyoktanin) in the suppurative stage. It may prove more effectual than carbolic acid. I never poultice boils. It will certainly favor the spread of the cocci. An external application of a strong solution of boric acid, borated calendula, thymol, or eucalyptol water, on absorbent cotton, is far better than a poultice, and if used hot, relieves the pain and tension just as effectually.

CHAPTER V.

DISEASES OF THE RESPIRATORY SYSTEM.

ACUTE CORYZA.

DEFINITION.—An acute catarrhal inflammation of the mucous membrane lining the nose and the cavities communicating with it. In the first stage the capillary vessels become engorged with blood; this occasions swelling of the mucous membrane which becomes infiltrated and edematous, and a quantity of colorless, salty, very thin liquid flows from the nostrils. In the second stage the secreted liquid becomes thicker and opaque, and the hyperemia and swelling of the membrane diminishes. Sometimes the exudation is fibrinous, similar to that of diphtheria, especially in children. These secretions are at first odorless, but later become nauseous and sometimes fœtid, and the taste bitter or musty. In the third stage the mucus may form hard crusts in the nostrils, or on the septum and turbinated bones, and in children it may completely close the nostrils. It may be bloody and the nose may bleed profusely. This bleeding usually gives considerable relief. The secretions may be so acrid as to irritate the nose and upper lip until they become red, swollen, and eroded. The inflammation by extending to the ethnoid and sphenoid cavities, may cause pain in the forehead, root of the nose, the frontal sinus, or in the malar region if the antrum is inflamed. It may extend up the eustachian tube, causing deafness, noises in the ears, and otalgia. It often extends down the posterior nares to the pharynx, larynx, and bronchi. The sense of smell is blunted and often temporarily absent, as is also the sense of taste. The fever is usually slight but may run high, even to 105°, and is remittent. This is the catarrhal fever, mentioned in some text-books, and is attended by soreness of the muscles, rigidity of the joints, and fits of chilliness on the slightest exposure to cold air. The fever may last only

a few days or may continue until the seventh day. It is generally supposed that a coryza is caught by exposure to cold and damp air, but I think it is often contracted by going from a cold atmosphere to a hot room, especially if the hot air is impure. There are times when the air is so damp and cold, especially at night, that almost every person exposed to it is attacked with coryza. There is a class of "cranks" who have an idea that they should open the window in their sleeping rooms every night, even when the air is cold, damp, and foggy. They get into bed and consider themselves safe from a catarrhal attack. They do not realize that breathing this air has the same effect as if they exposed the nude body to it. There are other "cranks" who pretend to believe that under all circumstances night air is as pure and safe as day air. They forget that the absence of the sun's rays is what makes night air less healthful than day air. It is always damper, and poisonous spores and germs are in much greater numbers in it. Rooms should be ventilated in bad weather without opening the windows. If there is an opportunity for bad air to get out of a room it will be replaced by better air from some other source. If a transom is open, and a strip of wood three inches wide placed under the lower sash of a window, fresh air will pass into the room and circulate without causing draughts. There are many persons who feel the first symptom of a coryza in the pharynx. It generally appears at night and awakens the patient with a hot, dry sensation at a small spot back of the soft palate. This irritation, passing upward into the nose, causes sneezing, and downward into the larynx and bronchi, cough.

Treatment.— If the patient will consult a physician of our school on the appearance of the initial symptoms, the "cold" or coryza can be aborted. If he will go to bed, drink slowly a tumbler of hot water in which are a few drops of tincture of camphor, he will soon perspire and in a few hours feel as well as usual. Another method is to take a drop or two of gelsemium every hour, or a tablet of gelsemium and camphor 1x every half hour; the catarrh may then be arrested in a few hours. Aconite 1x is used by many as an abortive in colds, one drop every hour. An unfortunate and delusive belief has taken possession of a large number of physicians and the laity, that quinine will "break up a cold." There is not a particle of evidence that quinine can abort or mitigate an attack of

catarrh. On careful inquiry I find that when benefit is claimed for it, the drug was taken with some hot drink and the patient brought on a perspiration. Instead of being of any value, it is a positive injury in the doses usually taken, two, five, or ten grains, for it produces congestion of the head, ears, nose, and eyes; and the engorgement of their blood-vessels favors inflammatory sequences. I admit that if used in minute doses it may be of value in congestive catarrhs, but the dose should not exceed the one-hundredth of a grain every two hours. The arseniate of quinine, if indicated, is a useful remedy, especially when hot, impure air is the cause of the coryza.

Many resort to the Turkish or Russian baths in the beginning of a cold; but in our climate it is a hazardous procedure. Many deaths from pneumonia have been caused by this unreasonable method. A hot-air bath, taken in one's own room, with the temperature at 90° or 100°, and followed by an inunction of cocoa butter or vaseline, the patient going to bed, while the room cools gradually to 70°, is better than any other kind of bath. A hot-water bath under similar circumstances is admissible. The administration of one-eighth grain of pilocarpine when the patient is in bed, will cause profuse perspiration. If there is a good deal of pain and soreness of the joints and muscles, gelsemium will generally relieve; if not, three grains of phenacetine every hour will give ease and sleep. The medicines adapted to the symptoms of a coryza after the initial stage, for their various manifestation, are many, and each case must be studied by itself. Those most often indicated are arsenic, arum, allium, euphrasia, bichromate of potassium, iodide of potassium, lachesis, phytolacca, nitrate of sanguinaria, sticta, and sabadilla. Iodine is probably the nearest to a general similium in all cases of catarrh of the air-passages. The iodides of arsenic, gold, silver, mercury, and antimony are all useful.

I need not advise the wearing of wool next the skin all the year in this climate, keeping the feet warm and dry, and rapid cold sponging if it agrees with the patient; all these should be adopted as prophylactic measures. Bathing should be judiciously practiced. Many bathe too much with soap, and render the skin so devoid of its natural oil that they are more likely to contract catarrh. Some of the greatest sufferers from catarrh, and those most apt to take cold

on the slightest exposure, have been permanently cured by relinquishing the habit of bathing with soap all over every day, and instead of this, annointing the whole body with some pure oil. The normal skin of a healthy person is saturated with oil; and the practice, therefore, of oriental nations, of rubbing oil into the skin after bathing, is founded on a correct physiological principle. Hydropathy, as it was practiced many years ago, deprived the skin of its natural oil; the consequence was that the skin became like parchment, or had a satiny feel and appearance, totally unlike the skin of a healthy human being.

Are colds infectious? This question is discussed by Mr. Hutchinson in the number of his Archives for December, 1891. He remarks that "colds" are capable of origination by influences brought to bear on the nervous system, and their secretions become infectious. He writes: "Thus many catch cold from exposure to draughts or damp, and many others from personal infection. No distinction is to be drawn between the two; they are as a rule exactly alike. Those which arise from infection may, however, be developed into special virulence, and may then prevail as epidemics, which are attended by more or less individuality of type. Probably infection is the cause of by far the greater number of common colds. Infection may be believed to be always at work when a cold goes through the family."

As I remarked above, impure air may cause an acute catarrh. This is especially true when the close heated air of a room is made impure by the exhalations from the noses of persons suffering from acute and chronic catarrh. The spores of ordinary catarrh and epidemic influenza cannot be the same. The epidemics of "epizootic" and "pink eye" are probably of a catarrhal nature.

CHRONIC CORYZA.

Definition.— Chronic catarrh of the nasal passages is divided into two forms: the dry and the humid. In the former there is little or no discharge, the patients complain of great dryness of the nose, and on examination the membrane looks dry and dull, not glistening. Thin crusts adhere to the surface. There is no obstruction

to nasal breathing, for the fossæ are roomy. This variety affects the eyes unpleasantly; the tears do not flow through the nasal ducts; constant, disagreeable lachrymation is the rule, especially if the eyes are exposed to a cold wind. The caliber of the duct and of the punctum of the eyelid is lessened; and there is a chronic persistent catarrhal conjunctivitis. The expired air from the nose is quite offensive, and the sense of smell is lost. There is almost constant frontal headache, and pain in the malar bones, and the patient is subject to facial neuralgia, affecting principally the fifth pair of cranial nerves.

In the humid variety there is an almost constant discharge of mucus, which may be white, yellow, green, brown, or bloody, and sometimes purulent. This mucus may become thick and tenacious, and form plugs or masses having the appearance of scabs, with an offensive odor. The passages are generally obstructed, both at the same time or singly, worse during damp weather or in impure air. If chronic catarrh is neglected or improperly treated, the mucous surfaces become ulcerated and lead to that most disagreeable and offensive symptom, ozœna, which almost banishes its victim from society.

Treatment. — In large towns and cities there are specialists who make a study of catarrhal and other diseases of the throat and upper respiratory passages. Many of them are charlatans who use this specialty as a means of making money out of ignorant patients. Others are honest and painstaking, who try to render good service. In small towns and villages the general practitioner is obliged to treat these diseases, and it is his duty to acquaint himself with the most modern scientific measures for success. He should study the works of Robinson, Bosworth, Rumbold, Morse, Dunn, and other authorities on this subject. The constitutional treatment is important. It is not often that a person in good general health is afflicted with chronic catarrh. There will be found an impoverished condition of the blood from malaria or malnutrition; the patient's clothing is not suitable, or his surroundings are not hygienic, or he indulges in alcohol to excess.

A common cause of chronic catarrh is excess or deficiency of under-clothing. One extreme is as bad as the other. Too thick under-wear is a common fault, the skin is kept too warm and per-

spiring, and the body rendered very susceptible to changes of temperature. Indulgence in hot baths, Russian or Turkish, contrary to the popular belief, produces a liability to catarrh, especially in our variable climates. The cool, quick sponge bath every morning is a better protection.

I shall not attempt to mention all the medicines useful in chronic catarrh. Nearly all our principal drugs may be indicated. I have found of most value iodide of arsenic, gold, iodide of lime, cubebs, copaiva, iodide of barium, eucalyptus, graphites, hepar sulphur, hydrastis, iodine, bichromate of potassium, iodide of potassium, iodide of mercury, phytolacca, naphthaline, sambucus, penthorum, terebene, nitrate of sanguinaria, sticta, sabal, iodide of sulphur, and sepia. All the iodides are useful, and cannot be dispensed with. It is difficult to give a separate list for the treatment of each variety of coryza, since all the real catarrhal remedies, especially the iodides, cause primarily a humid, and secondarily a dry or ulcerative catarrhal disease, making them useful in all the stages. One fact based on this must be remembered, namely: that when they are given for acute or humid catarrh the dose should be minute, and when given for the dry or ulcerative form, more material quantities should be used.

The diet of catarrhal patients should be liberal, but digestible. Naso-pharyngeal catarrh is aggravated by deranged conditions of the stomach. Foods containing fats should be used; sugar and pastry avoided. Cod-liver oil, maltine, iodide of iron, and the hypophosphites aid in building up the system and render specific treatment more beneficial.

The internal administration of nearly all the indicated remedies should be attended by their topical use. The nasal passages should not only be kept clean and aseptic, but should be subjected to the local influence of the appropriate medicine. It is utterly impossible successfully to treat severe cases by internal medicine alone.

To illustrate my method of using the appropriate remedy let us suppose that bichromate of potassium is indicated by the tough, membraneous discharge, the ulceration, the scabby formations, etc. Give the 6x on the tongue every six hours, and in the interval, every six hours, apply a spray of the same drug, one grain to the ounce. If we select one of the insoluble iodides, use the drug internally and pure iodine, one or one-half per cent solution, locally.

There are some drugs in the following list of great value when used topically, that are of no value internally.

Aristol, boric acid, carbolic acid, fluorsilicate of sodium, resorcin, thymol, ichthiol, eucalyptol, cubebs, copaiva, myrtol, lysol, benzo-napthol, naphthaline, oil of sabal, menthol, oil of gaultheria, chromic acid, bichloride of mercury, and peroxide of hydrogen. All of these are antiseptics and disinfectants, and exercise an alterative influence on mucous surfaces. Most of them are homeopathic to catarrhal conditions, because when used in a crude state they will cause abnormal discharges, ulceration, and destruction of mucous membranes. Of the above list I prefer boric acid, two per cent; thymol, 1 to 500; resorcin, two per cent; eucalyptol, one per cent; oil of sabal, five per cent; and chromic acid, 1 to 1000; very rarely do I use the bichloride of mercury, for it is serviceable only in syphilitic cases, it should not be applied stronger than in a 1 to 5000 solution. Resorcin and thymol are the two favorite remedies of the best specialists. Resorcin has a great affinity for oxygen, absorbs it from the tissues, and reduces congestion and inflammation by contracting the vessels; in hypertrophic catarrh it contracts the tissues, and this effect lasts a long time; it leaves no bad result, no hypersensitive condition, as does cocaine (which should be applied only as a temporary expedient), and can be used continuously for a long time without any reaction; but it should be absolutely pure. In dry catarrh I find a four per cent ointment in liquid vaseline very pleasant to the patient.

Thymol is better adapted to dry catarrh, as a very weak solution, 1 to 1000, will restore the secretion and disinfect the passages. If the patient dislikes the odor, add a few drops of oil of gaultheria to the solution.

Albolene or benzoinol makes the best vehicle. The purified liquid oils, of which liquid vaseline is the type, have become very popular vehicles for all the medicines soluble in them. They generally agree with the patient, and are soothing to mucous surfaces. There are patients who complain of them, believing that they experience better effects from watery solutions. The experience of specialists is, that we should test both watery and oleaginous solutions.

The oil of sabal (saw palmetto) is one of my favorite local applications; it closely resembles resorcin in its effects. There is at first

a pungent, burning sensation, owing to a volatile constituent, but after this has passed off, a soothing anæsthetic sensation is obtained.

Next in order I prefer eucalyptol prepared with albolene or in water, after the method heretofore given. The pleasantest of all the oils of any value in catarrh, is the oil of white pine needles. It is distilled from the needle-like leaves; the odor is fragrant and delicious, and I never had a patient object to it; it is not irritating unless the membrane is raw and eroded. A five or ten per cent solution in liquid white vaseline is an elegant preparation. It is equal in antiseptic and disinfectant properties to most of the above named drugs.

There are hundreds of ingenious hand and steam atomizers in use, the principal requisite of which is that it throws a spray, fine or coarse as required, and that the spray should be continuous and not intermitting.

Ointments and nasal suppositories or pencils holding the selected remedy will prove of value in some cases. Polypoid excrescences, or real polypi, if found in the nasal passages, can sometimes be removed without the operation of extirpation. Thuya (ten per cent) sprayed upon them will often cause their disappearance, especially if they are pedunculated. Nitrate of sanguinaria 1 to 1000, and chromic acid 1 to 1000, used as a spray, have been found useful in nasal polypi.

Ulcers in the anterior nares or on the septum, and fissures on the margin of the alae, should be treated more thoroughly than is usually done, in order to prevent the bacillus of erysipelas from entering them. The ulcers should be touched with carbolic or chromic acid, fifty per cent, or pyoktanin, if they are deep and suppurating. If there is yet only an erosion or abrasion, an application of a five per cent solution of nitrate of silver will prevent ulceration.

Bichromate of potassium is the best internal remedy. The fissures should be treated on the same plan as those of the anus. Stretch the margin of the alae until the fissure is deepened, then with a pointed glass rod lightly touch the bottom with fuming nitric acid; or the fissure can be made slightly deeper with the knife, and then treated with nitric acid, or nitrate of silver.

Follicular disease of the naso-pharyngeal space is one of the most frequent complications of nasal catarrh. The discharge which flows

down the posterior nares irritates the follicular glands and excites them to increased secretion; they swell, and finally become hypertrophic, a condition that remains circumscribed to the vault of the pharynx in its median portion, although it is no uncommon occurrence to find it developed also upon the lateral walls around the eustachian orifice, as well as upon the posterior and superior portion of the soft palate, giving a mamillary aspect to the turbinated bones themselves. In very old cases of naso-pharyngeal follicular disease, the mucous membrane becomes much atrophied, the hyperglandular development subsides, and there is diminished secretion from the affected region. In this variety we are apt to have a somewhat glazed or dry appearance of the pharyngeal wall which extends itself sooner or later into the median portion of the pharynx, an appearance, but not a real ulceration. Inspissated mucus is often found blocking up the eustachian orifices, or filling the neighboring depressions. We find numerous granulations with depressed mucus-covered inter-spaces all over the posterior pharyngeal wall. Besides this there are many enlarged and tortuous vessels winding over the infiltrated and inflamed surface of the pharynx, and pillars of the fauces. The aspect of the former is oftener mottled, although of a predominating slate color, owing to the varied hue of the granulations.

The symptoms of this disease are (1) a sensation of stuffiness, or oppressive fulness in the superior and posterior portion of the nasal passages; (2) the falling down from the palate, and from the posterior nares of a greater or less quantity of mucus, which, according to the age, extent and severity of the disease, may also vary in physical characters. It may consist of small starchy pellets, or masses of viscid, tenacious and almost colorless secretion, without odor, which are surrounded by a foamy, aerated expectoration, or of larger, heavier, yellow or greenish mussel-like conglomerations of an essentially muco-purulent nature ("Robinson on Nasal Catarrh"). At first it is easy for the patient to detach these masses by "hawking," but after they become tough and adhere to the walls, it is difficult to do so. In children, who do not seem to have the power to detach them, these masses are often seen hanging down from the nares in great quantity. In a day or two they part with their watery portion, become dry, and look like bone. They are sometimes mis-

taken for diphtheritic membrane, especially when they take on a fœtid odor owing to decomposition; and they may poison the blood if there are any abraded surfaces there to absorb the poison. They are so difficult to detach that it requires long douching through the anterior nares with glycerine and water mixed with alkalies. They interfere with normal breathing through the nose, and prevent sleep by the constant desire to "hawk," or swallow. Children suffer greatly from the presence of these masses. It prevents their sleeping; makes them nervous and irritable; destroys their appetite; or causes nausea and vomiting of food, especially in the morning. Adults who use liquor to excess are great sufferers from this disease; they vomit even before or after their breakfast, unless they swallow raw whisky or brandy as soon as they wake. One great obstacle to "breaking off" the liquor habit, is this morning nausea. An intense occipital headache accompanies this disease, which resists all treatment based on subjective symptoms, but when we cure or alleviate the follicular disease, the headache leaves. Ladies are often so sensitive and disgusted by the hawking, and offensive breath, that they refuse to go into society and become morbid and hypochondriacal. The tongue is often thickly coated with a brown fur. This, with the offensive breath, and intensely bitter taste in the mouth, give both patient and physician the idea that it is caused by biliousness.

Deafness is a common accompaniment of this disease, owing to the occlusion of the eustachian tubes. Children with follicular throat diseases are especially liable to scarlatina and diphtheria. I am inclined to the belief that it is contagious, and that susceptible persons who breathe the same air, or are brought in contact with such patients, may contract the disease.

Treatment.— The two stages, the hypertrophic and atrophic, will not yield to the same treatment; we must select our internal and topical remedies to suit the pathological condition, not the subjective symptoms.

Iodine approaches more nearly the ideal similimum for follicular diseases of the pharynx and contiguous passages, than any other drug. The medicinal disease caused by it runs through the same stages, and has similar complications. A large proportion of cases can be treated successfully by iodine alone, the 3x or 6x internally, and a five or ten per cent solution in glycerine locally applied with

a brush or injected through the nose. Next in value is the yellow iodide of mercury. The Symptomen Codex, the first Materia Medica of our school except Hahnemann's, published in this country, contained an excellent article by Dr. G. W. Cook, on this drug. He pointed out with great accuracy the condition of the throat, wherein iodide of mercury was curative, and the symptoms he gave are almost identical with those of pharyngeal follicular disease.

The red iodide of mercury (merc. biniod.) is more suitable for the severest forms of the disease, when the neighboring glands (submaxillary, cervical, etc.) are affected, and the malady has a syphilitic origin.

Iodide of arsenic is next in value where the disease has followed a violent acute influenza, or scarlet fever, and the secretions are very acrid and offensive. (Phytolacca, arum, nitric acid, and nitrate of sanguinaria are congeners of iodide of arsenic, and can be used if the latter fails to change the disease within a reasonable time.)

Iodide of gold, although it has not been proved or used by anyone but myself, has a very beneficial effect in the stage of atrophy, and especially when the bones of the nose appear to be affected. Iodide of silver ought to be equally useful when selected from the symptom of its two elements.

Iodide of potassium was found by Dr. Meyhoffer to be specific when the iodide of mercury failed. He recommended it very highly for hypertrophic pharyngitis, and reports many cures of chronic cases from its use. Dr. Beverly Robinson declares that he never saw any curative effects from it, but that instead it always aggravated the disease. He says, "When taken for one or more days consecutively in moderately large doses, it will usually produce a very red and swollen condition of the mucous membrane of the air-passages. The nose will become so much stopped up as to interfere with normal breathing through the nasal fossæ. Subsequently there is a considerable transudation of watery fluid from the vessels of the pituitary membrane, and increased discharge from the glandular follicles. The habitual symptoms of an acute attack of coryza are established, etc."

Is it a matter of surprise that Dr. Robinson does not like iodide of potassium? Does he suppose he can put out a fire by pouring oil on it? He was using an exquisitely homeopathic remedy, and his

"moderately large doses," probably five to ten grains several times daily, could do nothing else than aggravate a disease so nearly like its own poisonous effects.

Dr. Meyhoffer used the dilutions from the 1x to 3x. His doses were not strong enough to aggravate, yet strong enough to set up a curative process in the diseased tissues.

Iodide of lime is an excellent remedy when the disease occurs in fat lymphatic children, with swollen submaxillary and cervical glands.

Iodide of sulphur is superior to sulphur alone; and iodide of barium is indicated when the glands of the neck are swollen, hard, and threaten to suppurate.

After the iodides, I place most reliance on cubebs, copaiva, thuja, phytolacca, bichromate of potassium, hepar sulphur, and hydrastis. They are all capable of producing a diseased condition closely resembling the one under consideration.

Cubebs is valued very highly by Dr. Robinson, who is not content to give it in medicinal doses, but must needs saturate the system until the stomach, urinary organs, and skin suffer from its effects. Yet he declares he cures more cases with this drug than with any other. He prefers the pulverized cubebs. He says the oil and oleo-resin disappoint him. The homeopathic indications for its use are the tenacious, stringy, offensive, yellow or green discharge, the hypertrophic mucous membrane and follicular glands, and the clinging character of the mucus. It does not cause ulceration like bichromate of potassium, or erosion and atrophy like hydrastis. My experience accords with that of Dr. Robinson. The tincture is useless, and the dilutions of the oil and oleo-resin not much better. I prefer a trituration of very finely ground cubebs, ten to twenty per cent, with granular sugar of milk. It acts much better when laid upon the tongue than when taken at once into the stomach. I order ten to twenty grains every three or four hours, continued for several days or weeks, until improvement is decided. At the same time I have this same powder snuffed up the nose, or thrown in with a powder blower so that it will reach the posterior nares.

Copaiva is rarely indicated, but is useful when the discharge is muco-purulent and appears to run into the fauces from some cavity. It runs down from the posterior nares so rapidly and in such quan-

tity that it causes nausea. The throat is not highly inflamed, but feels rough and raw.

Thuja is not so highly valued as it should be in catarrhal follicular disease. It has more "hawking" of tough tenacious mucus, with soreness, rawness, and other painful symptoms, than the pathogenesis of any other drug. The sphere of the drug corresponds to this disease, and I am surprised at its neglect. I paint the diseased surfaces with a ten per cent glycerine solution, and spray the posterior nares with it.

Bichromate of potassium is so favorably known that I need not give the indications. My former pupil, Dr. C. A. Williams, of Chicago, has had unusual success with it. He gives the 3x internally, and applies a solution of one grain of the crude drug to one ounce of glycerine and water. He advises it in all stages, and even in ozæena.

Chromic acid is not much used, yet I have had good results with it. During one winter when the influenza was prevalent in this city, a great many people were left with a peculiarly severe granular pharyngitis which seemed rebellious to ordinary treatment. Knowing the value of chromic acid in follicular and granular endocervicitis, it occurred to me that it ought to be of equal value in this disease. In order to test its value I selected a few of the worst cases. After removing the secretion from the pharynx I painted the surface with a one per cent solution in water, ordering the patient not to swallow for a minute or two. This was applied every day for a week. Improvement set in at once, and all the cases recovered in a short time. In a few cases I have used a ten per cent solution, but made only one application every five days. Care should be taken that none of the solution is swallowed.

Phytolacca more clearly resembles the preparations of iodine than any other vegetable drug. It ranks with iodide of potassium, iodide of mercury, and iodide of arsenic. It is particularly indicated when there is great soreness and lameness of the internal muscles of the throat and tongue, and a raw, contracted, stuffy feeling in the swollen pharynx.

Hydrastis has won much popularity in post-nasal and pharyngeal catarrh. It is as much indicated in the follicular as in the catarrhal disease. It is of most value when applied topically, but enough will

be swallowed to get its admirable tonic effect on the stomach. It should be injected or sprayed through the nose, and used as a gargle. The non-alcoholic preparations should be used. They are made from the yellow and white alkaloids, and are called "fluid hydrastis" and "fluid hydrastin." A ten per cent solution of these fluids should be used. An elegant preparation is made by adding eight grains of the white alkaloid to eight ounces of distilled water, with half an ounce of glycerine. The yellow preparation stains badly, and is objected to; the white alkaloid does not stain.

Oil of sabal (saw palmetto) is an excellent remedy in both stages of follicular disease. It can be used in an atomizer, a two per cent solution in albolene or liquid vaseline, thrown up the nasal passages; or a ten per cent trituration in sugar, placed on the tongue and slowly dissolved. Besides its curative local action, the oil acts as a prevention of catarrhal dyspepsia, and increases the assimilation of food.

Aristol, two drachms to the ounce of albolene, used as a spray, removes the fœtor in atrophic rhinitis more effectually than any other drug, except peroxide of hydrogen. Prof. W. A. Dunn, in a lecture on this disease, said, "In the atrophic type, the cardinal principle is antisepsis and stimulation. In this form you will find the greatest service from such remedies as sulpho-carbolate of soda, Dobell's solution and glycerine, combined with some active remedy, such as the glycerite of tar, tannic acid, or some other stimulating remedies.

"In the hypertrophic type, it is the intention to favor nutrition and secretion. In this form you will find the most relief from soothing and astringent applications, such as the glycerite of eucalyptol, hydrastis, and other remedies of this class, combined with albolene or benzoinol. In the hyperæsthetic type, no local application should be used under any circumstances, as the tissues are so over-sensitive that local means only increases the irritation. [I can hardly agree with this last assertion, for I have found that a two per cent solution of cocaine or resorcin does relieve and soothe.]

"Any preparation of petroleum, which is perfectly bland, non-irritating, and a most excellent menstruum for eucalyptol, hydrastis, calendula, or other remedy of this type, is especially serviceable in

the hypertrophic type, as a remedial and soothing application combined.

"The glycerites of tar, hydrastis, and eucalyptol are serviceable in the atrophic type of catarrh, to stimulate secretion and bring about a more active nutrition of the parts. It is essential, however, before beginning the treatment, that all deposit be thoroughly removed before the remedial drug is applied. This can be best accomplished by sulpho-carbol, or Dobell's solution. The antiseptic tablets after my formula (sulpho-carbol, one grain; hydrastine, white alkaloid, 1-150 of a grain) are serviceable for removing the mucus, and also for medicating the mucous membrane at the same time.

"The most desirable method of applying the solution is with my modification of the Davidson's atomizer. It is desirable to have the application applied to the posterior end of the nose, behind the soft palate, and the usual curved tip supplied with the atomizer is not long enough to go behind the soft palate when it contracts. This is overcome by a long tip with two openings, allowing a double spray, which is sufficient to wash away the tenacious mucus.

"Applications to the anterior portion of the nose are of little service and do not properly reach the diseased membrane, as most types of catarrh are situated at the posterior end of the nose."

Aluminum is useful in the atrophic naso-pharyngitis of old people.

Penthorum ought to be useful in the incipient stage of the hypertrophic variety. It has "fullness in the head, nose, and ears, with profuse discharge from anterior and posterior nares, and with a constant 'wet' feeling in the throat, with rawness and stuffiness. It is an analogue of sticta, but the latter has symptoms of a more advanced stage. Its headache is more violent, and it has a dry, raw, sore, stiff feeling of the palate and pharynx."

Wyethia has a similarity to both, but the raw, excoriated feeling is predominant, especially at the sides of the pharynx.

On examining cases of pharyngitis, there will sometimes be seen one or more very red, raised, velvety patches, like the erosions found on the os uteri. On applying a weak solution of nitrate of silver (five per cent) with a brush, they will change to a healthy hue after a few applications made every three days. It should never be applied strong enough to cauterize.

HAY FEVER.

Definition.— Hay fever, or catarrhus æstivus, is defined by Kippax as a "miasmatic disease, caused mainly by the action of the pollen of plants and grasses upon the organs of respiration"; by others as a "neurosis, having its seat in the nasal and respiratory mucous membranes." It is supposed by some pathologists that certain persons have in their nasal passages certain "sensitive areas" which connect with the nerve centres in the medulla, and that when these are irritated by any foreign substance the disease is excited. It has been maintained that in certain persons this disease will appear when the vital forces are low, irrespective of any local irritation.

It is a curious fact that hay fever is confined almost wholly to the educated classes, attacking professional men, and delicate, sensitive women; its victims are mainly among the Anglo-Saxon races, in temperate climates; it is rarely if ever seen in the Southern United States, and never in the tropics. It attacks its victims, generally those between the ages of fifteen and forty-five, annually, during the months of June, July, August, and September. It appears suddenly, often the very day or hour at which it appeared the year before, and lasts about six weeks, leaving behind it no perceptible effects. It is hereditary in some families. The belief that it is caused by the pollen of certain plants has not yet been proven beyond doubt. If pollen be the cause, why is any race or country free from it, for there are nervous people all over the world, and pollen is universal. The rule that relief from the disease is gained by a residence in certain high altitudes, would seem to favor the pollen theory. The White Mountains, the Adirondacks, the Island of Mackinaw, the shores of Lake Superior, and a few locations in the Alleghany and Rocky Mountains, are said to be free from it. Dr. Blakely's experiments and investigations, apparently showing that at a certain height above sea-level pollen is not found in the air, would favor the pollen theory. Admitting all this, there must be an abnormal condition of the nervous system, manifested by sensitive nerve areas in the respiratory mucous membranes, which allows the pollen to exert its irritant effects. There are two forms of the dis-

ease, the catarrhal and the asthmatic. The catarrhal form has all the symptoms of a violent influenza — namely: violent paroxysmal attacks of sneezing, with a thin, watery, acrid discharge from the nose; redness of the conjunctiva, swelling and redness of the eyelids, and profuse lachrymation. There is a burning and smarting in the eyes, nose, pharynx, larynx and bronchi. In some cases, one of which is my own, it attacks only one side of the head, one eye, and one nostril. This would seem to be a proof of its neurotic nature. The experiment has been tried of causing it by having the subject smell an artificial rose. It caused an attack in those who believe a rose to be the exciting cause.

The asthmatic variety is in addition constantly accompanied by a laryngo-bronchial catarrh, which sometimes attends, at other times follows, the naso-pharyngeal irritation. The asthmatic attacks generally occur during the day, and are accompanied by a violent, irritating, almost spasmodic cough.

Treatment.— Thousands who have the means go to some region known to give relief, but there are many who cannot leave their business without great sacrifices. For such there should be some preventive treatment. I have found that, beginning a week or two before the expected attack, if the iodide of arsenic be given in doses of the 1-100 or 1-1000 of a grain three times a day, the disease does not appear. It has been reported that the same results have followed the use of Fowler's solution of arsenic, one to three drops, three times daily. The double iodide of mercury and potassium in the 6x trituration, and the arsenite of quinine, are said to be preventive. Quinine in doses of five grains three or four times a day has been used with alleged good results.

Dr. Alex Rixa ("Therapeutic Gazette," January, 1891) reports that he prevented the appearance of hay fever in six cases by means of the following treatment: Two weeks before the expected annual attack he had the patient irrigate the nose with a warm solution of common salt four times a day; and a few minutes after each irrigation the nares were sprayed thoroughly with peroxide of hydrogen and glycerine, equal parts. This was repeated every day until the time of the expected attack. Three days before, he gave them five grains of salol and five of phenacetin three times a day, continued for a week. In two of these cases, although there were no nasal

symptoms, about two weeks after the expected attack some asthmatic symptoms appeared. He believes the peroxide of hydrogen acts on the germs that excite the disease, and destroys them. He does not believe with Sajous and McKenzie that there are any "sensitive areas," because he could not find them in any well developed case.

In the December number of the "Therapeutic Gazette," for 1892, Dr. Rixa claims to have found a specific for the hay asthma, which he could not prevent by the oxygen treatment; this remedy is terpine hydrate. "In small doses (two to five grains) it liquifies and increases the secretion of the bronchial mucous membrane and facilitates expectoration. In large quantities (fifteen to twenty grains) it reduces the secretion and renders expectoration less, until it stops altogether. In cases of bronchial dyspnœa consequent upon the plugging of the bronchi by a too copious secretion, it is of the greatest value." This shows us how differently large and small doses act in the suffocative catarrh of children. I have given the 1x trituration with better results than I get from ipecac, sambucus, or stibium. During the course of the disease I have known naphthaline, in all doses, from five grains of the crude drug to the 8x trituration, to terminate the severity of the symptom in a few days. Its internal use can be aided by a spray of the one or two per cent solution in albolene or benzoinol, or even in water; chloroform water, 1 to 1000, is an excellent vehicle. The iodides of arsenic, gold, and potassium will often entirely cure the nasal and pharyngeal symptoms in a short time. A spray of peroxide of hydrogen can be used at any time, as can also carbolic acid, hydro-naphthol, benzo-naphthol, thymol, and that excellent compound "thymo-hydrastis." Some interesting experiments have shown that a mixture of several antiseptics is as powerful against germs as the sum of all their separate antiseptic powers.

I have never seen any decided good results from aconite, allium, ammonium, aralia, arum, euphrasia, lachesis, or sulphur; but I have seen good effects from bromide of camphor, sticta, ambrosia, and nitrate of sanguinaria. Sabadilla is an unrivalled remedy for the spasmodic and paroxysmal sneezing (in the morning) with only slight catarrhal discharge.

The asthmatic condition, ipecac, grindelia, quebracho, arsenite of copper, and euphorbia pilulifera will greatly palliate if not

remove, but they must be given in appreciable doses, ten to twenty drops of the tincture every few hours (arsenite of copper 3x).

The dry, harassing cough which often attends the first stage, destroying the patient's rest and sleep, can generally be controlled by doses of hyoscyamus 1x, or hyoscine hydrobromate, 1-500 of a grain. Large doses of chloral hydrate produce an array of symptoms closely imitating hay fever. In several instances I have thought that its use in small doses cut short an attack. It is especially useful when conjunctivitis is present, and when the serous acrid discharge from the nose runs down the posterior nares and causes such constant hawking as to prevent sleep. In my own case I suffered greatly from these symptoms, and never found any remedy for them until I took five grains of chloral every hour. After the fourth dose I fell asleep, and did not awake until nearly morning, when I found to my surprise that the thin acrid discharge was replaced by a bland thick mucus, and a few days afterwards the catarrhal symptoms disappeared. This has since been the invariable result of its use in nearly every case in which I have prescribed it.

Antipyrin, in some people, causes symptoms much like chloral, and there have been many cases reported in medical journals where it is said to abort the disease. Phenacetin is of decided benefit when the chief suffering appears to be in "the bones of the head and face." The seat of pain is probably in the frontal sinuses and the antrum. Mercury, iodide of potassium, and aurum are the homeopathic remedies for the inflammatory action in these cavities, and should be alternated with phenacetin. If the latter fails to relieve the pain, codeine, one-fourth to one-half a grain, can be given. At one time cocaine was largely used in the form of spray or injections into the nasal cavities. It relieves the fulness and swelling of the mucous membrane very quickly, and for a time allows easy breathing through the nose, allays the pain caused by the obstruction, and permits the patient to sleep, if the spray (two per cent) be repeated every two hours. Lately there has been a reaction against the use of cocaine. It is said that the cocaine habit is acquired by its absorption, and that the drug exerts an insidious influence over the brain; its magical palliative effects are a temptation to use it too often. Another objection to its continued use, is the increased sensitiveness and irritability of the mucous surfaces.

I have used resorcin, one per cent solution, with better ultimate results, as it has some of the anæsthetic effects of cocaine; it reduces the swelling of mucous surfaces, and possesses considerable germicidal qualities.

COUGH.

The belief of the laity, and possibly of a good many in the medical profession, is, that all coughs arise from some portion of the respiratory tract. The fact is, however, that there is hardly any portion of the body which may not excite a cough.

A cough, according to Landois, consists in a sudden violent expiratory explosion, after a previous deep inspiration and closure of the glottis, whereby the glottis is forced open and any substance, fluid, gaseous or solid, in contact with the respiratory mucous membrane is violently ejected through the open mouth. This act, as we all know, is voluntary or involuntary; voluntary in so far as we can produce the act at pleasure, and involuntary or reflex in that a point is often reached in bronchial irritation or from any other cause whereby, with all our will power, we are unable to stay the act. Kohts, in Landois' "Physiology," has located a coughing centre a little above that of the inspiratory centre in the medulla oblongata. According to this experimenter, the afferent paths are the sensory branches of the vagus, and the efferent lie in the nerves of the muscles of expiration and of those that close the glottis. That there are other paths there can be no doubt, as can often be seen from clinical experience; though by far the largest amount of work is done by the latter nerves. So important is the par vagum in our coughing miseries, that the refreshing of our minds with the anatomy of its sensory branches will not be amiss.

Dr. Leaming, of New York, has well said, "The par vagum is a chummy, friendly nerve. It is the source of all our friendships. We dine together, meet together, drink together by its influence." The pneumogastric or tenth cranial nerve has its origin from a nucleus in the medulla oblongata along the ninth and eleventh nerves, and passing forward, it leaves the cranium through the jugular foramen, being enlarged at the latter point into what is known as the jugular ganglion. Its main sensory branches, and hence those most involved in cough and most important to us, are as follows:

"(1) The auricular branch, coming off from the jugular ganglion, receiving connecting branches from the glosso-pharyngeal or ninth, crossing the facial and giving sensory branches to the posterior portion of the auditory meatus and the adjoining part of the outer ear.

(2) The pharyngeal plexus is aided in its formation by branches from the par vagum and from the ninth. From this plexus sensory branches supply the soft palate, arch, and probably the posterior portions of the inferior turbinate bones.

(3) The superior laryngeal, the sensory nerve to the base of the tongue, and all the mucous membrane of the larynx, is pre-eminently the nerve of cough.

(4) The pulmonary branches of the vagus join the anterior and posterior pulmonary plexuses, and hence, from this source, supply sensory (cough exciting) fibres to the whole bronchial system, lungs, and pleuræ.

(5) The sensory fibres to the stomach and also to the liver, and through connections with the great solar plexus, probably send fibres to the organs of generation.

"From this brief anatomical exposition, we see from what sources irritations may come in producing cough, and being thus fortified in our knowledge we are better able to seek the proper source. The character of a cough depends largely upon the locality and nature of the cause of which it is a symptom. For we must bear in mind that we are not discussing a disease, a distinct entity, but a symptom of a disease or morbid state, and it is the latter condition which determines its character. Various words have been used as descriptive of peculiar kinds of cough, and it is well for us to pause for a moment and consider in our minds the meaning of such adjectives most frequently used, as brassy or metallic, hoarse, spasmodic, jerky, hacking, croupy, rasping, etc.

"When we speak of cause in relation to cough, we of course mean those pathological conditions with which it is associated, by the removal of which the cough ceases. We cannot say that enlarged faucial tonsils always produce a cough, but that they are sometimes a casual factor we must admit, since a persistent cough often eases upon the removal of these organs. Hence, in this article, we shall try to consider all those factors which, in the light of clinical expe-

rience, have been found to aid in the production of this symptom. In all diseases of the lungs and pleura cough is a prominent symptom, but to discuss the diseases of these organs would extend this paper beyond a reasonable length; so that, with the exception of a passing remark, the points of the article will be confined to the respiratory tract above the bifurcation of the trachea. To classify causes with distinct lines of demarcation is difficult indeed, but simply to aid us in the study, I have made the following arrangement:

"(1) Causes dependent upon an acute pathological state of the respiratory tract, as (a) Lungs and Pleura; (b) Larynx and Trachea; (c) Pharynx.

"(a) Lungs and Pleura.—In all acute and chronic diseases of the lungs and pleura, cough is a prominent symptom, as one would naturally expect from the anatomical distribution of the pulmonary plexus. How familiar to many of you is the short, dry, jerky cough, with the accompanying stitch in dry pleurisy? How, also, the deep basilar cough of pneumonia? With a pulmonary cough there is usually the accompanying expectoration, sometimes labored and even requiring several efforts before it succeeds, while in pleurisy there is nothing to eject, and, consequently, the cough is dry and hacking. In acute and even chronic bronchitis, cough is one of the most distressing symptoms, and one which causes the patient many a sleepless hour. The accumulation of secretions in the bronchial tract is often the most irritating factor, for we note how aggravated a cough is in the early morning hours before the expulsion of the secretions which have accumulated during our sleeping moments. Who has not seen this, the most distressing symptom, in phthisis pulmonalis? Cavities in the lungs are always exciting factors, for it is here that the dirty, purulent secretions find a never-ceasing abode. Dr. Leaming, of New York, has recently called attention to the first paper of Dr. G. P. Cramman, in which the latter dwelt upon the management of lung cavities by position, thus showing how one of the most harassing symptoms of this dreaded disease could be alleviated. The idea is based upon the fact that if you make the patient lie so that the cavity can be thoroughly emptied by cough and gravity, and he then be made to turn back, allowing an interval for its refilling, he can in this way secure at night several hours of needed rest. If the cavity is not thoroughly emptied, the constant running

over, as it were, from the mouth of the reservoir acts as a continual source of irritation.

"(b) Acute Inflammation of the Larynx and Trachea.—This condition has, as one of its commonest symptoms, cough, either dry or moist. The congestion thus occasioned by the inflammatory state, together with the increased amount of the secretion usually present with it, acts as an irritant to the nerve terminals in this locality. Upon this theory, therefore, the richer a portion of the tract is in nervous supply, the more irritable it will be and the more harassing and persistent will be the cough. Physiologists tell us that a cough cannot start from an irritation in every portion of the respiratory tract, but that certain areas only are supplied with nervous irritability. These are the glottis respiratoria and the bifurcation of the trachea; other portions, they say, as, for example, the true vocal bands, are more or less insensitive. These facts are based exclusively upon the experiments of Kohts and Vulpian. Theoretically, this may all be true; but practically we know that cough comes from irritation in any portion of the tract, and in inflammatory conditions we cannot limit this state to any circumscribed area. The character of a cough originating in the larynx and trachea is determined by the character of the existing pathological state or the anatomical formation of the region, according to the age of the individual. The tone of all coughs is modified by the condition of the larynx, and especially that of the true vocal bands, whether there be true œdema, or exudative material upon their surface. If, with a croupy cough, there is free expectoration, how much more favorable is the prognosis than when the exudation is membraneous and clings with deathlike tenacity to the surrounding parts.

"The treatment of this symptom is but the treatment of the disease, the main object being to lessen the hyperemic condition of the mucous membrane. All remedies for cough originating from this region are given to act locally, whether administered internally to be eliminated through the respiratory tract, or applied directly by means of inhalation, a method much the surer. I will not stop to mention all the remedies which have been brought forward as specifics for cough due to this pathological state, but will allude only to those that have proven of most value in my hands. I dislike always to administer any form of opium if it can possibly be avoided,

and for this reason I use an inhalation treatment almost entirely. Dr. Bishop, of Chicago, a few months ago, advocated the use of a spray of menthol-camphor for various laryngeal troubles, and since that time I have used the remedy with marked success in laryngeal and tracheal coughs. While Dr. Bishop first called attention to the mixture of camphor-menthol, Dr. Hobbs, of Atlanta, was the first to bring prominently before the profession the use of both menthol and camphor in the treatment of nasal diseases. Triturate together equal parts of camphor and menthol, forming a deliquescent mass, and of the mixture make a one to four per cent solution in albolene, and with a suitable oil spray producer allow the patient to inhale it three or four times daily. Another remedy I have used with success is a mixture of terebene in vaseline oil (one drachm to two ounces), inhaled in the same way as the first. In a cough accompanying a severe laryngitis, the compound tincture of benzoin, given by hot steam inhalation as recommended by Lennox Browne, of London, is a most valuable remedy.

"(c) Pharynx. — In acute follicular pharyngitis, cough is sometimes present, due to the unusually irritative character of the follicles as the current of air strikes its surface. The treatment consists in the thorough destruction of the follicles, best done with the galvano-cautery point, followed with astringent applications of nitrate of silver.

"(2) Functional, or such as are dependent upon pathological states or deranged functions, more or less chronic: as (a) Nasal; (b) Pharyngeal; (c) Laryngeal; (d) Aural; (e) Gastric; (f) Hepatic; (g) Reproductive.

"(a) Nasal.— All physicians who have worked to any extent in the nasal cavities know how frequently cough is excited when the mucous membrane covering the turbinates is touched with a probe. I have a little patient upon whom a violent fit of coughing is produced whenever a spray is used in the anterior nasal fossæ. This, of course, is reflex irritation but for a moment, and ceases when the spray is removed, but what we see here as a momentary cause becomes a continuous one in enlarged turbinates or in septum spurs. Dr. Beverly Robinson, of New York, speaks of coughs of this character as due to posterior hypertrophies of the inferior turbinate, producing pressure and irritation by contact with the septum. Some

rhinologists have found certain areas in the nose more sensitive than others. Dr. John McKenzie, of Baltimore, found in the posterior portions of the inferior turbinate the most irritable area, while Mr. Lennox Browne, quoting Hack, found it in the anterior portion. Nasal neuroses, dependent upon abnormalities in the nasal cavities, have of late taken a prominent place as casual factors in producing many symptoms before unknown. That such abnormalities play an important role, no one can deny who has seen the benefits accrue to patients relieved of these morbid conditions. Deviated septums, spurs, enlarged or hypertrophied turbinates, polypi, etc., can all, by reflex irritation, be a cause of cough, hence it behooves a physician to examine thoroughly into the nasal cavities when no discoverable lesions can be found elsewhere as a casual factor in the production of this symptom. To go into the methods of treatment of the different forms of nasal diseases that cause cough would make a lengthy article of itself; suffice it to say that every source of possible irritation should be found and removed. Hypertrophies are best removed with the galvanic cautery, and polypi should be thoroughly extirpated with the wire ecraseur. All septum deviations and spurs, when prominent enough to be a source of irritation, should be removed by whatever method the operator chooses. Naso-pharynx adenoids, besides an obstacle to free nasal breathing, are sometimes an active source of coughs, as is also an enlarged third or pharyngeal tonsil. The pharyngeal tonsil is a collection of lymphoid tissue, usually in the median line of the vault of the pharynx, and while often overlooked, it is frequently the source of a post-nasal catarrh, and a causal factor in the production of the symptom in question. If a patient be examined with a post-rhinal mirror, this globular, red, protruding mass will be seen in the vault, and, in the majority of cases, coated with ropy mucous secretion. The only permanent cure for this condition is the complete extirpation of the offending masses, best done with some post-nasal forceps. Adenoids should always be removed as soon as possible, that the attending train of symptoms may be eradicated.

"(b) Pharyngeal.—An elongated uvula is another source of cough, and must not be overlooked, its character being of a hacking nature without expectoration. I dislike to mention the uvula as a causal factor, from the fact of its abuse and the rough treatment it has

received at the hands of many physicians. How often has a poor, innocent little, slightly elongated uvula been clipped, when no other cause for a cough could be found, and the patient thus made to suffer the inconvenience of an incomplete closure of the post-nasal space in deglutition. One must observe whether the uvula is relaxed or falls with ease upon the base of the tongue before looking upon it as a source of irritation. Cough due to this cause is most troublesome at night when the patient is lying down and the organ falls against the pharynx. The treatment consists in the reduction in the size of the organ, either by medicament, or ablation of a portion. Astringents should always first be tried, and, these failing, provided the length warrants, abscission can be performed, usually with success. One unaccustomed to the performance of the operation will invariably incise too much and leave the patient in a more uncomfortable state than the one previous. A large portion of the uvula being muscular, it has a tendency to contract, so that its muscular portion should not be cut. In the majority of elongated uvulæ, one will always see between the mucous membrane and the muscle a distinct line of demarcation, and it is here that the line of clipping should be made. Long forceps and scissors are all that is required. Do not cut off too much, if you do not want the unsavory benediction of your patients. Hypertrophied faucial tonsils, while not frequent, is sometimes the cause of a persistent cough, especially in children. Dr. Beverly Robinson, of New York, makes mention of the fact, and Lennox Browne, in speaking of a neurotic cough, believes that there is always an objective cause. He says the commonest of these is the irritation of enlarged tonsils, and cites two cases where the removal of these organs was followed by the cessation of that symptom. He further says, 'Recent experience leads me, even where the tonsils are not enlarged, to suspect adenoid growths in all cases of reflex spasmodic cough. Adenoids and enlarged tonsils so commonly exist together, that a thorough inspection for both is always demanded.' Beverly Robinson says, 'Hypertrophy of this structure (tonsils and adenoids) gives rise to congestion of the lower naso-pharynx, and this increases the sensory excitability.' The treatment of this condition is the removal of the enlarged tonsils by whatever method the operator chooses. McKenzie's tonsilotome is a favorite instrument with many, and has proven very satis-

factory in my hands. The means matters little, provided they are removed.

"Enlarged lingual tonsils.—The name tonsils, in this connection, is misleading, for the morbid condition rather signifies a collection of lymphoid tissue, lobulated in appearance, at the base of the tongue, especially at the sides. This lymphoid glandular tissue is sometimes the cause of a harassing, rasping cough, especially in singers or public speakers, among whom this condition is most prone to exist. So common is it among this class that I immediately look for it when singers consult me for treatment. Numerous mention has been made of this condition in the recent literature upon this subject. A. Ruault, in the 'Archives de Laryngologie,' as late as June, 1888, speaks of it, as does also Dr. J. W. Gleitsman, in the New York 'Medical Record' for December, 1887. Associated with the cough is a feeling of constriction in the throat and the sensation as if a foreign body were present whenever the act of deglutition is performed. The treatment consists in its removal. If lobulated and large, it can be removed with the wire ecraseur; otherwise, the occasional application of the galvano-cautery will be found more serviceable.

"(c) Laryngeal.—Under this head must be mentioned the growths, whether external or internal, benign or malignant, which, by their presence, irritate some filaments of the superior laryngeal nerve, and cause cough. Removal of such growths will prove the only satisfactory treatment. The accumulation of a dirty, purulent secretion in the larynx, attendant upon an existing atrophic rhinitis, is frequently a source of irritation and productive of a cough, which is only removed by the cure of the nasal disease.

"(d) Aural.—Cough from irritation of the auricular branch of the pneumogastric, is an occasional, though infrequent, occurrence. Many cases have been reported where the removal of impacted cerumen, foreign bodies, etc., from the external auditory canal has relieved a cough of long standing. Such a case I saw a few weeks ago in that of a medical student, who had exhausted all the known remedies for his cough, only to experience relief when a large mass of impacted cerumen was removed. In the last edition of Dr. Roosa's work on 'Ear Cough,' he quotes numerous authorities who hold the same view. The treatment consists in the thorough removal of all

abnormal substances from the external auditory canal, especially if they be present upon the membrana tympani.

"(e) Gastric.—Gastric neuroses manifested by reflex irritations in other portions of the body are no uncommon occurrences, especially in the work of the general practitioner. The anatomical relationship to the great solar plexus of nerve makes the stomach a centre from which many nerve impulses originate, and which may thus prove a centre for many reflex phenomena. The three great vital centres, the brain, heart, lungs, are greatly influenced by its morbid condition or any functional derangement of the same. A 'stomach cough' is no infrequent occurrence with children. Flatulency, distension, loss of tonicity, are some of the frequent concomitant symptoms. Young children from under the watchful care of their mother frequently overload their stomachs with cakes, candies, fruits, etc., the result of which, manifesting itself at bedtime by an incessant cough, is quickly relieved by an efficient emetic or a good dose of oil. Indigestion plays no small part as a causative factor in this symptom, and hence a well regulated digestive apparatus is a matter of necessity as well as of comfort.

"(f) Hepatic.—Organic rather than functional derangements of the liver are more apt to act as excitants of a cough. Alcoholic subjects especially are more prone to suffer from this symptom, whether they be suffering with a hypertrophic or atrophic cirrhosis of this organ. A case recently under my charge affords a typical example of the condition in question. A German, male, aged forty-five, was referred to me by his family physician on account of an incessant cough of the most explosive nature, which had yielded to no course of treatment. The patient gave a good family history, and to all appearances his present physical condition, save the cough, was excellent. By the habit, acquired in his fatherland, he was an excessive beer-drinker, with an occasional interspersion of more spirituous liquors. His pharynx was very sensitive to the least manipulation, and vomiting would be produced with the slightest provocation. By degrees a thorough examination was reached. The nasal cavities showed nothing as a causal factor, and the pharynx, save the anæmic, soggy condition of the mucous membrane throughout the oral cavity which one usually finds in chronic alcoholics, presented nothing abnormal. The retching would cause the epiglottis

to appear unusually large, but when quiet was restored to the parts, no pathological changes could be seen within the larynx. I then turned my attention to the stomach and liver, and found him suffering with a condition of chronic gastritis, and, by palpation and percussion, the liver was found to be much enlarged and hardened, with slight tenderness. Whenever firm pressure was made over the hepatic region, a paroxysm of coughing was immediately started. The morbid process had so far progressed that no remedies succeeded in staying it. I doubt not that many of you have often seen a nervous, hacking cough, dependent upon an engorgement and torpidity of the liver, quickly relieved by some hepatic stimulant or mild cathartic. In malarious districts this condition is frequently an exciting factor, and a thorough regimen of treatment must be instituted before the symptoms will abate.

"(g) Reproductive.— Before closing, I must mention a cough which is sometimes present about the age of puberty, seemingly dependent upon the condition of the reproductive organs or of the blood. In 'The Lancet' of December, 1890, Sir Andrew Clarke had an article entitled, 'Remarks on the Barking Cough of Puberty,' and cites several cases of this condition occurring in his practice, both in boys and girls. Dr. Leaming, of New York, who has since called attention to this subject, has reported such a condition occurring in a young girl suffering from chlorosis, following an attack of mountain fever. The late Sir Morell Mackenzie has also reported such a case. That there is a close relationship between certain conditions of the reproductive organs and certain nervous phenomena in other portions of the body, no one, I am sure, will deny, for day by day appreciation of the correlation of our bodily functions is growing in importance. Dr. John McKenzie, of Baltimore, has called attention to certain nasal conditions coexisting with a peculiar state of the reproductive organs, which, from their constancy, do not seem to be entirely fortuitous. In all cases the treatment must be general, the aim of the physician being to restore the body to as normal a condition as possible by rectifying all morbid states in individual organs."

I do not propose to give the indications for all our medicines for cough. In no department of therapeutics is it so important to search for the cause, and prescribe for *that*, and not for the cough and its

sensations. An ovarian cough, for example, can be cured only by an ovarian remedy; a hepatic cough, by a drug having an affinity for the liver. First, ascertain the original focus of irritation, then select a remedy having an elective affinity for that localitity, and if such a remedy is also indicated by the totality of the distinctive symptoms, it will cure promptly. Some of these reflex coughs are so violent, and demand such immediate relief, that we are justified in using palliatives, but we cannot expect to cure such a cough, unless we find the specific remedy.

HYPERÆSTHETIC PHARYNGITIS.

Under this title Dr. Dunn calls attention to a class of cases which have come under his observation, in which serious reflex symptoms have come from hyperæsthetic spots within the larynx. This orifice is as intimately connected with other portions of the system as are the other orifices of the body, and as frequently exposed to irritating causes.

"Granular pharyngitis, or clergyman's sore throat, has been one of the frequently discussed diseases for many years; like nasal catarrh and polypus, it is one of the diseases that has been known and abused for the past ages.

"But three chronic diseases in this region have been generally understood by the laity: catarrh, nasal polypus, and clergyman's sore throat. These diseases, like liver complaint, covered a multitude of sins, and were all considered incurable. In recent years, with the careful diagnosis and the application of new methods of treatment, the diseases formerly specified under these three heads have multiplied into many."

But little has been said, however, of the hyperæsthetic type of granular pharyngitis, and he is sure that it is most worthy of attention. A little source of irritation may produce many and various results. "I have seen," he writes, "a small hyperæsthetic spot in the pharynx destroy the voice, produce spasm of the larynx, and undo the general condition to such a degree that permanent ill health was brought about. Patients suffering from the hyperæsthetic type of granular pharyngitis complain of continued irritation in the pharynx on one or both sides, with many types of reflex disorder.

"One cannot sing from loss of voice, another complains of pain in the ear, another of hoarseness, another from general nervous irritation and hysteria, another with a cough, and so on the round of nervous reflexes.

"On examining the throat there appears on the posterior wall the usual type of granulation. There may be one or many, but the most frequent hyperæsthetic spot is on the sides of the pharynx behind the posterior pillar. As a rule a ridge of red, almost granular tissue is seen extending upward behind the posterior pillar on one or both sides. This may be very small or as large as a pencil, and from one-eighth to one inch long. Sometimes, in touching this spot with a probe, the patient is attacked with a paroxysm of coughing, or a sense as if a foreign body was in the larynx or ear.

"As a rule, the disease is not attended by pain other than the reflex irritations. The throat is frequently inflamed when the granulations become increased in size and more irritable. This condition begins, I believe, in a simple catarrhal inflammation which affects the glandules and arytenoid tissue in this region, producing a hyperæsthetic change and over-growth of tissues. In this increased growth is developed the over-sensitive termini of the branches of the recurrent nerves which supply this portion of the pharynx, and are so intimately associated with other parts of the system. The nerve ends become hyper-developed and extremely sensitive, and for this reason the tissues become over-sensitive to all irritation, both mental and physical. In some cases I have observed that mental excitement produced increased hyperæsthesia of the throat and added much to the reflex irritation."

Dr. Dunn gives a few illustrative cases to convey the idea of the serious result attending this disease.

"Case 1.—Mrs. H., age thirty, and of extremely neurotic temperament, had suffered for many years from general ill-health. She was poorly nourished, emaciated, and extremely nervous. She had been treated for uterine trouble, for rectal trouble, for catarrh, for dyspepsia, for anæmia, and for many other diseased conditions, without good results. It had been impossible to find the source of irritation or to cure it. She was referred to me on account of some irritation of the pharynx that had been unsuccessfully treated by sprays and other usual applications for the throat. On examination I found

the pharynx to be dotted here and there by granular pharyngitis, while on each side of the pharynx posterior to the pharyngeal fold, were moderately developed hyperæsthetic granules. For these, I advised removal by electro-cautery, as it has been my experience that local applications to this type of trouble are of no avail. The result of the removal of these growths was truly remarkable. The patient immediately improved in general health, the appetite returned, the nervous irritability was relieved, and in a short time the patient had gained twenty pounds in weight and was restored to good health. It is difficult to appreciate how so small an irritation can so thoroughly depress the general nervous system, and destroy the nutrition to such a degree as to produce a permanent state of ill-health. But when we bear in mind that this sensitive spot is a continuous thorn in the flesh, as it were, and in direct communication with vegetative and the recurrent nerves, we can appreciate how such a condition may be brought about.

"Case 2.—A lawyer complained that on attempting to speak, his voice would suddenly become hoarse and devoid of pitch There was a sensation as if he must clear his throat, with a slight irritation in the larynx. The hoarseness was a peculiar dullness of the voice. On examination of the larynx the vocal chords appeared perfectly normal as well as the whole laryngeal fold. On the posterior wall of the pharynx could be seen two small hypertrophic spots, which, being irritated by the sound, produced exactly the symptoms of which he complained. This convinced me at once that they were the source of irritation and I advised their removal, which was done by the electro-cautery, and he has had no symptom of hoarseness recur for two years.

"Case 3.— Mrs. J., a prominent actress, was obliged to abandon her engagement because of inability to produce certain tones and to sing in public. She complained that when appearing in public her voice was absolutely lost and she was unable to produce a tone. The pharynx and neck would become spasmodically and violently congested. The throat, including the thyroid gland, would become swollen externally; in fact, she had lost all power over her voice when attempting to sing in public In the parlor, when no one was present, she had a moderate control of her voice, yet not perfect. An examination of her throat revealed a large hypertrophic and

sensitive spot on each side of the pharynx, occupying the entire space behind the posterior pillar of the fauces. This I believed to be the source of her irritation and I removed it. The result was most perfect, as the voice was restored to its former power and she was relieved of the spasms and irritation in the throat. In this case I am sure the nervous influences had much to do with bringing about the immediate spasm. The pharyngeal irritation was not sufficient to destroy the voice except under mental excitement, but the irritation plus the mental excitement was sufficient wholly to destroy the voice and bring about the spasms and congestion of the whole throat, both externally and internally."

ACUTE LARYNGEAL ŒDEMA.

In a recent lecture Prof. W. A. Dunn, of Chicago, said:

"This condition is not very common and is but poorly understood, as a rule, by the general practitioner under whose observation such cases come, and who, if not familiar with the condition, is liable to let slip the valuable moment when the patient's life may be saved.

"It is very rarely observed that acute laryngeal œdema, accompanied by a spasmodic closure of the larynx, occurs, yet I have seen a few cases of this type. A case lately came under my observation, in which an active laryngeal œdema had taken place, even to the point of suffocation. The man had taken cold three days before I saw him, and had had a moderate chill and fever. The pharynx was slightly inflamed, with an excessive secretion of mucus. He very soon developed difficult respiration which grew worse and worse. The patient was able only to vocalize in whispers, and the suffocation grew to be extreme. The secretion of clear, glairy mucus was very great, and his painful attempts to expectorate added to the suffocation. On examining the larynx I found the arytenoidian regions and the arytepiglottic fold very greatly swollen and œdematous. The larynx proper was not especially implicated, but the swelling was above the vocal chords, the left side being worse. I advised the sucking of particles of ice, together with apis and belladonna, and the patient made a good recovery without accident. I

cautioned the family that on the slightest symptom of violent suffocation to notify the physician, who was to open the larynx. The great danger in such cases is the liability to spasm of the larynx, closing the small fissure that is left for respiration.

"The excessive secretion of mucus produces more or less desire to cough and expectorate. The patient is liable to have an attack of coughing that will expel much of the residual air in the lungs, and at the end, the irritation produces a spasm of the larynx that closes the glottis entirely. This paroxysm is so sudden and so violent that everyone is taken unawares, and if the doctor or the attendant be not forewarned and prepared for such an emergency, the patient is apt to die before the spasm will be relieved. If the condition be secondary to some other local inflammation in the throat, we must bear in mind the original cause and relieve that as rapidly as possible, in order to prevent increased accumulation in the larynx, but if the laryngeal condition assume alarming proportions, we must exert our energies toward relieving the symptoms of suffocation.

"We must bear in mind that the indication is to restore the breath-way, either through the laryngeal opening or through the throat. The most desirable procedure is intubation, but if the attendant be not sufficiently skilled to perform this operation, the next resort is to open the trachea through the throat. This may be done with a single cut of a knife, and, under alarming circumstances, a pen knife, butcher knife, or any sharp instrument will answer the purpose. It is certainly unfortunate to stand by and see a patient die when the partition between the life-giving air and the lung is so thin. One should have no hesitancy in opening the trachea without regard to future results, because it is certainly better to be a live man without a voice than to be a dead man with the larynx whole.

"The most dangerous part of such a procedure is the liability of destroying the voice by separating the thyroid cartilage, which would most certainly follow an unskillful and hurried tracheotomy. There is but little danger in opening the trachea under such circumstances if a physician can be secured soon after. The hemorrhage is liable to be very profuse, but can be stopped without danger and the tube afterwards inserted. Under any circumstances open the trachea before the patient is dead; but even after life seems extinct the patient may be restored by the tracheotomy.

"It is sometimes possible to relieve the spasm by placing the finger in the larynx and elevating the epiglottis and forcing open the laryngeal opening. This can be hurriedly done, and if not successful, the trachea can then be opened. I carry in my operating case a pair of Schrotter's laryngeal dilators. This instrument is a large curved canula, which may be introduced into the larynx through the mouth and retained in position as long as necessary. With it I can open the larynx and restore the patient until the breathing is established, after which I can proceed to perform intubation or tracheotomy if necessary.

"The greatest thing under such trying circumstances is to know what to do, to have the courage to do it, and to be on hand at the proper time. In a single moment a distinguished mind is gone, and with a single stroke of the knife it may be returned. Such is the experience of the skillful physician who holds life in his grasp."

Several cases of œdema of the glottis have been promptly cured by apis and pilocarpine, the latter given in doses sufficient to cause salivation.

THE TREATMENT OF NASAL STENOSIS.

Prof. W. A. Dunn, M.D., of Chicago, in one of his lectures says:

"There is no class of troubles more serious and far-reaching in its effects than the closure of the nasal and naso-pharyngeal passages.

"If this condition occur early in life, the effect on the growth of the child is most remarkable, both as to constitutional and local changes. The violent effort of breath-taking produces changes in all organs pertaining to this physiological function, especially marked on the formation of the chest and face.

"The thoracic walls are compressed by the inter-costal muscles at the points of attachment, while the other portions are forced outward by the violent efforts of breathing. The sternum is forced inward at the lower portion and at the top, while in the middle it is usually forced outward, making the condition known as pigeon breast.

"The facial expression is markedly affected, because of the open mouth, the compressed nose, the drooping eyelids, the vacant expres-

sion of the eyes, the pigeon breast, and the generally imbecile look of the mouth-breather. The effect on the development of the brain in these cases is very great. The child suffers from a continual reflex cerebral congestion, which is especially marked during sleep, when the breathing is much more difficult. Such cases are disturbed by continual dreams and nightmare. The effort at breathing becomes exceedingly violent and at times apparently suspended. The child starts with a gasp and a violent effort, and the breathing is reëstablished.

"Such a condition of cerebral irritation cannot fail to produce an unhappy result in the cerebral nutrition and growth of the brain and mental faculties. Such children suffer from mental depression, dullness of intellect, and general bad nutrition.

"The causes of nasal stenosis are as numerous as are its serious results. They may be located in the nose, the naso-pharynx, or the pharynx. The nasal conditions are either congenital or acquired, and may have their origin on the facial or septal side of the nose. The congenital conditions are due to a mal-formed nose, in which that organ is narrow, pointed, and almost or completely filled by the turbinated bones. In such a nose there is often a narrow nasal orifice in which the alæ are so closely coapted with the septum that it acts as a valve during inspiration, and in that manner causes the stenosis. In cases in which a partial stenosis is due to congenital causes, this often becomes in after life a complete stenosis from a moderate hypertrophy of the turbinated bodies, requiring operation later in life.

"Deviated septums are frequent causes of congenital stenosis, but seldom require operations until later in life, when catarrhal hypertrophies cause an occlusion of the opposite side. Different types of simple and benign tumors are frequent causes of nasal stenosis; hypertrophies of the nasal tissue, the result of catarrh, nasal fracture, dislocation of the nasal cartilages, plastic adhesion of the posterior nasal tissue, and septal protuberances, each form their part in making up this long list of nasal stenoses.

"The naso-pharyngeal conditions are arytenoid growths and other types of naso-pharyngeal tumors, which may be found in this region.

"Adhesion of the soft palate to the posterior pharyngeal wall,

from syphilitic or tubercular ulcerations, are not uncommon. Hypertrophy of the tonsils is the most frequently observed pharyngeal condition producing mouth-breathing.

"The treatment of all these classes of troubles resolves itself into one of surgical operation: Remove the growth with sufficient thoroughness to produce a normal breathway. It matters not what the condition, if the breathway be interfered with relief must be obtained, and the most important part is the diagnosis and the manipulative skill to perform the operation. Nasal hypertrophies should be removed with a snare or the scissors, the deformed nose should be relieved by removal of the turbinated bone, protuberances of the septum should be relieved with a saw, the deflected septum should be broken up and replaced, the fractured nose should be properly restored and placed in splints, the plastic adhesion should be removed with the post-nasal forceps, polypi should be removed with the cold snare and the bases treated with the electro-cautery, malignant tumors should be thoroughly removed if not too far progressed, either through the nasal opening, or by dissecting up the lip and opening the whole nasal space. The arytenoid growths are best removed with the post-nasal curette, and tonsils should be excised with a properly selected tonsilotome. The electro-cautery in complete nasal stenosis is seldom of value. Like every other good instrument, it has had its enthusiastic stage and is now used for the most valuable results. It is seldom possible to remove sufficient tissue by the electro-cautery to restore properly the breathway except in those cases of chronic catarrh in which the enlargement of the turbinated bodies is due to a chronic congestion and not to a hypertrophic change.

"The danger of operating in the nose is reduced to a minimum by skillful manipulation. No operation should be made without the parts being thoroughly under observation.

"The use of the nasal drill and burrs, and the dental engine, I believe to be unnecessarily severe and unscientific.

"With the saw, the scissors, the knife, the snare, the electro-cautery, any of the usual operations can be easily and successfully performed. The most serious danger in nasal operations is hemorrhage, which can be relieved only by proper plugging, whether anteriorally or posterially; but with a properly applied nasal plug

through the anterior portion of the nose, serious hemorrhage seldom follows."

EPISTAXIS.

Definition.— Bleeding of the nose may be idiopathic or symptomatic, active or passive. It is idiopathic when no change can be discovered in the tissues of the nose. It occurs in the young, plethoric, and robust, and generally between the ages of ten and twenty. It is usually arterial, and is generally salutary, being nature's method of preventing cerebral congestion, or getting rid of an excess of blood.

Epistaxis is sometimes due to a cachectic condition of the blood. It is common in those persons called "bleeders," who, owing to a constitutional tendency, bleed from any portion of the body, even the skin and sound mucous surfaces. It is sympathetic when caused by diseases of the liver, spleen, or kidneys. It often occurs at the age of puberty in both sexes; and in girls it appears at the period when the menses should appear. In women it often precedes or takes the place of the menses, when it is called vicarious menstruation. Mountain climbers have epistaxis when they reach a certain height, and travelers on railroads through and over mountains often bleed freely at the nose. When it occurs during typhoid fever, scarlatina, diphtheria, or small-pox, it is sometimes of grave import.

Treatment.— Medicinal treatment is often sufficient. A resort to mechanical measures should be delayed as long as possible, for a sudden stoppage of the flow in plethoric or apoplectic subjects is dangerous to the patient. Aconite, gelsemium, and veratrum viride are sufficient when the state of the circulation calls for their use. They arrest it by decreasing the blood-pressure in the arteries. (Mother tincture or 1x.)

Belladonna, glonoine, mellilotus, crocus, millefoil, bryonia, and ferrum are strictly homeopathic to active hemorrhage when the arterial pressure and dilation is above normal. (3x to 6x.)

Arnica and bellis perennis arrests it when it is caused by a blow, concussion, or high altitudes.

Bryonia, pulsatilla, sanguinaria, senecio, trillium, and cocculus, when it appears before, during, or at the menstrual period.

Hamamelis, cardunus aurum, and collinsonia when it is *venous* and there is general or local varicosis.

Aesculus, sepia, sulphur, nux vomica, aloe, and collinsonia when apparently connected with piles or portal congestion and hepatic disorders. When occurring in persons with the hemorrhagic diathesis (bleeders), the chief remedy is ergot (secale), which acts best when used hyperdermatically (ten to twenty drops of the normal tincture, or cornutin solution); phosphorus, lachesis, china, and elaps, are also good. Ipecac has been known to arrest epistaxis, even in small doses. Erechthitis, erigeron, thaspi, cannabis indica, and turpentine have been used successfully in arterial hemorrhage. Turpentine, however, like ustilago and ergot, is also useful for passive hemorrhages when the blood is dark, thin, and grumous.

Carbo vegetabilis appears to have some specific influence on passive epistaxis, when the blood is not in a normal condition.

Mechanical measures, such as cold to the head and back of the neck; hot foot baths; bending the head forward; holding the arms above the head; have all been useful. Injections of pure lemon juice; dilute hamamelis, and a weak solution of chloride or per-sulphate of iron have been used with success; also a ten per cent solution of antipyrin, with ten grains internally, or a saturated solution on lint, pushed up to the bleeding surface, are said to have been successful.

Guarana, twenty drops of the tincture every hour, cured an obstinate case. In a case of epistaxis during purpura, xanthium arrested it promptly after all other means failed. The expressed juice was injected up the nose.

Lesions of the nostrils as a cause of epistaxis are sometimes overlooked. Two obstinate cases once came under my care, and on examination I found a granular surface high up on the septum, which bled on the slightest touch. A fifty per cent solution of chromic acid was carefully applied, and the bleeding never returned.

Polypi may cause profuse bleeding, which will cease only on their removal.

LARYNGISMUS STRIDULUS.

(Asthma of Millar. Child Crowing. Spasm of the Glottis.)

Definition.—"A convulsive seizure limited to the muscles of respiration. Sometimes it affects exclusively the muscles of the glottis, in other cases it may implicate also the diaphragm and other muscles

concerned in breathing. The disorder must not be confounded with laryngitis stridulosa, in which there is inflammation of the glottis with spasm superadded. Laryngismus as it affects the vocal chords is a pure spasm, arising, as other spasmodic attacks are so apt to do in the child, from reflex irritation." (Eustace Smith, "Diseases of Children.")

It is more common in England than in this country. It occurs under two different conditions. In the new-born in whom no other deviation from health can be observed, and in rickety children between the ages of six or eight months and two years. It occurs almost invariably in winter, and the attacks occur night or day, when the child awakes. There is no cough, no hoarseness, but the respiration is arrested and the child struggles for breath, the face gets congested, and then with a sudden relaxation of spasm, the air is drawn into the lungs with a high-pitched, crowing sound, which has given to the affection the name of "child crowing." Convulsions may occur during the attack, or there may be carpo-pedal spasms. The fingers are firmly clenched upon the thumbs and the toes are flexed under the feet. In complicated cases the diaphragm and muscles of the chest are involved, and there is convulsive retraction of the abdomen. The heart may be affected by spasm, and act irregularly and tumultuously, with small, frequent, and irregular pulse. I have seen cases where there seemed to be a general tonic spasm, almost a tetanus. Death may occur in such cases, even when apparently mild and uncomplicated, from asphyxia. According to Dr. J. Solis Cohen, death may occur from incarceration of the epiglottis, which is drawn forcibly down until its free edge is caught between the posterior face of the larynx and the wall of the pharynx, so as to cover the glottis like a lid and completely occlude it. Sometimes sudden death takes place with all the symptoms of fatal syncope.

In new-born babies it may be mistaken for infantile tetanus. It can hardly be mistaken for spasmodic croup, for there is no fever, hoarseness, or cough. The exciting causes are teething, undigested matters in the stomach, fright, anger, and bad dreams. The struggles of a child when taking medicines, whether bad tasting or not, will often excite a spasm. Mothers and nurses call the attack "holding the breath."

Treatment.—If the child is seen during the attack the inhalation

of ammonia smelling salts will often cut it short, or in other cases a few drops of amyl nitrite, or chloroform, used before the epiglottis is closed. Dashing cold water in the face is quite effectual in shortening the spasm. Thrusting the oiled finger deep into the throat, by provoking vomiting or disengaging the epiglottis, will arrest it. The radical treatment should consist in cold sponging or bathing. Place the child in a sitting posture in a tub of cool or warm water, then with a sponge wet in cold water rapidly sponge the head, neck, and back. This should be repeated two or three times a day. The child, warmly dressed, should be kept in the open air, even in cold weather, several hours a day.

In selecting the remedy, not only the local spasm, but the general condition of the child, should be considered. If the child comes of neurotic parents whose other children have chorea or some such neurosis, aurum bromatum is a valuable remedy. Aurum is almost specific in epileptiform convulsions, night terrors, and the spasmodic stage of whooping cough. The bromide has been found useful in petit mal, even in grand mal. In spasm of the glottis the bromide is best, but chloride of gold and sodium has proven efficacious in my hands. To very young infants give the 6x trituration; older children require the 3x; two grains three times a day.

Arsenite of copper is next in value. Both are indicated in a large proportion of cases when the children are anæmic, cachectic, or rickety. The 3x or 6x according to the age should be persistently given for weeks. A leading indication is that some spasmodic symptoms persist all the time.

Moschus is highly recommended by Eustace Smith and Lilienthal. It is homeopathic to recent cases in children in ordinary health, and when some remote irritation or a hysteric temperament is an exciting cause. A grain of the 2x every six hours.

Gelsemium has cured many cases when the exciting cause has been the cutting of a tooth. The inspiration is long and croupy, the expiration sudden; the child's face is scarlet, not dusky.

Bromide of camphor, especially in female children, acts favorably. The general nervous erethism of the child, with spasms which threaten to end in collapse, calls for its use. Dose, 1x to 3x trituration in grain doses three times a day.

Sambucus was recommended by Hahnemann from symptoms of

his own proving. I do not consider it indicated for true spasm of the glottis without cough, fever, or catarrhal symptoms. Sambucus has all of these, and the spasm is a complication. When used for these conditions it is invaluable. It should be useful when the spasm is associated with profuse bronchorrhœa. Passiflora ought to be a good remedy for this condition, but we have no clinical experience in its use. Chlorine has been recommended.

ACUTE CATARRHAL LARYNGITIS.

Definition.— A simple inflammation of the mucous membrane of the larynx, often extending to the submucous tissue. Four-fifths of of all the mortality from this disease occur in children before the tenth year. In some cases the disease is complicated with rheumatism of the muscles of the larynx. It is generally caused by exposure to cold and dampness, especially if the neck is the part exposed. It is a common attendant of influenza and *la grippe*, and occurs in measles and other eruptive diseases. The symptoms are soreness and pain of the throat in the region of the larynx. In rheumatic cases external pressure is very painful. If hyperæsthesia of the larynx is present, coughing excites spasm of the glottis, and anything around the throat, however loose, causes great anxiety and a feeling of suffocation. The cough is hoarse, barking, and generally occurs in severe paroxysms. The cough has a "barking" sound when the vocal cords are thickened and tense. The voice is cracked, deep, hoarse, and sometimes lost. The aphonia is caused by the swelling of the vocal cords, preventing vibrations. The expectoration, at first scanty, is in the early stage clear and glassy; later, thicker and more turbid; and finally yellow and purulent. Dyspnœa is sometimes extreme if the submucous tissue is much affected.

Treatment.— In mild cases with some fever, aconite is the only remedy needed. Belladonna acts well, if there is pain on swallowing, with face flushed, and a sensation of dryness and constriction in the throat.

Iodide of lime is an admirable remedy when there is rawness, burning, soreness and tenderness of the larynx, with frequent cough,

hoarse, and barking, and a sensation of tightness and constriction. Dissolve five grains of the crude drug in half a glass of water, and give a teaspoonful every half hour.

Hepar sulphur is useful in nearly all cases, when there is hoarseness, deep, coarse voice, and a hollow, barking cough.

Phosphorus when the cough is dry, or expectoration scanty, sometimes blood-streaked, and there are painful stitches in the larynx; speaking or change from warm to cool air aggravates.

Spongia when the cough is shrill, crowing, and dry; or with fine wheezing in the larynx, with scanty, tenacious expectoration.

Sanguinaria when the cough is constant, painful, hoarse, or barking. It often relieves when hepar sulphur and spongia fail. Inhalation of hot lime water; swathing the throat with cool or warm water compresses; or the rubbing in of lard or vaseline, gives decided relief. If spasmodic or suffocative paroxysms occur, give hyoscyamus or sambucus. The former when the cough is very dry; the latter when there is excess of mucus.

Œdema of the larynx extending to the glottis, epiglottis, and arytenoids, generally occurs during attacks of laryngitis. It may attend scarlet fever, measles or typhoid fever. It is a swelling marked by rapid infiltration and serous effusion.

The chief remedy is apis mellifica (or preferably apium virus, a trituration of the stings alone). Many years ago I cured with lachesis 10x two of the few cases I ever treated. The enlarged epiglottis was livid in spots and the slightest touch to the external throat caused terrible suffocative spasm. The pellets were placed on the tongue and gave relief in a few hours.

Iodide of potassium will cause acute œdema of the larynx and glottis, even in small doses, in some persons. A case was recently reported in which calomel was given, alternately with the iodide of potassium, which resulted in almost fatal œdema of the larynx. The reporter supposed iodide of mercury was formed. But the iodide of potassium should have been given alone. It ought to act curatively in œdema in very small doses.

Arsenic is said by J. S. Mitchell to be "the remedy *par excellence* for this affection." It may be, but not for acute cases. It is better when there is a low state of the blood, which would induce

œdema anywhere. Iodide of arsenic would have a more prompt effect.

Some lives have been saved by deep scarifications. Application of a three per cent cocaine solution has been recommended, but I doubt its value.

Dr. Mendoza ("Journal of Laryngology") injected one-third of a grain of pilocarpine, divided into three doses, which were given at twenty-minute intervals, with the result that calm, good breathing took the place of the severe dyspnœa from which the patient suffered previous to the injection.

In one case where œdema threatened, I obtained relief after giving five doses of one-hundredth grain of the muriate of pilocarpine on the tongue, repeated every fifteen minutes.

CHRONIC LARYNGITIS.

This disease sometimes follows an acute attack, but oftener arises from an extension of a pharingitis. It may be simple, tubercular, or syphilitic.

The most common symptoms are a hacking short cough, or a "hemming," induced by a desire to clear the throat. The pains are tickling, burning, sticking, and stinging, with a sensation of fulness and tension.

There are alternations of the voice, from hoarseness to complete aphonia. The hoarseness is worse on rising in the morning, or after sunset. It improves after eating, and using the voice in the morning, but is aggravated by talking or singing in the evening. All the symptoms are worse in cool and damp weather, and they improve in warm dry weather, and in the climates of Florida, Cuba, and a few warm protected valleys in Southern California and New Mexico.

Treatment.—Iodine, iodide of lime, hepar sulphur, spongia, phosphorus, and sanguinaria, used in the acute stage, are equally valuable in the chronic. In addition, aurum, argentum, cedron, collinsonia, bromine, carbo vegetabilis, causticum, eriodictyon, bichromate of potassium, creosote, naja, phytolacca, iodide of potassium, nitric acid, rumex, nitrate of sanguinaria, stillingia, senega, silphium, and wyethia, are all useful remedies.

Aurum, iodide of potassium, phytolacca, and stillingia are the remedies when the affection is syphilitic. The dose is of great importance. Aurum will cure in the 3x or 6x. Iodide of potassium must be given in large doses, not less than one to ten grains three times a day. Ricord cured intractable cases with enormous doses, half an ounce a day, but its action in such doses must be watched, as in some persons it causes sudden œdema of the glottis with dangerous results.

Phytolacca and stillingia are useful in doses of ten to sixty drops three or four times a day.

I have had the best success in non-specific cases with hepar sulphur, causticum, phosphorus, eriodyction (yerba-santa), creosote, nitrate of sanguinaria, and silphium. In follicular laryngitis, I prefer iodide of mercury, sabal, seleniate of soda, and iodine internally; and topically by means of an atomizer throwing a very fine spray, or a steam atomizer throwing a vapor. I have seen the happiest results follow the use of a vapor of copaiva, creosote, sabal, iodine, cubebs, eucalyptus, and thuja; five per cent solutions in albolene. Resorcin has proved of great value in some cases.

When there is a suspicion of tuberculosis, creosote is the most important remedy, and in material doses. Begin with one-tenth of a drop in syrup of Balsam Peru, and increase this gradually to one or even five drops. When more than one drop is given, the best method is in capsules, which are now prepared ready for use. An emulsion of cod-liver oil with one grain of hypophosphite of lime and one drop of creosote to each dessert spoonful has enabled me to cure several cases where emaciation and hectic were present.

Hygienic Rules.—Never allow patients to swathe the throat in flannels, but insist that they go with the neck exposed day and night, bathing it in cold water, with a brisk rubbing afterwards. Advise men to wear not a full beard, but rather a mustache. The best climate is either cold and dry, or warm and moist. Send patients to either during the winter and spring and they will improve. Probably the best climate in the United States is in the interior of Florida, between latitudes 23° and 27°, on high rolling pine lands.

Sulphur waters moderately used generally benefit sufferers with chronic laryngitis. White sulphur springs are the best.

I have treated many great vocalists, prima donnas, and tenors,

and it may be of some interest to know what medicines benefited them most.

Christine Nilson always received immediate benefit from phosphorus 2x. On several occasions it restored her voice in a few hours.

Clara Louise Kellogg was always relieved of hoarseness, rawness, and desire to clear the throat, by copaiva and proto iodide of mercury. The late Dr. John F. Gray of New York prescribed copaiva for her, always in the 1x trituration. He considered it one of our most valuable remedies for catarrhal hoarseness.

Mme. Lucca was benefited only by iodide of potassium, two grains three times a day. On one occasion causticum 3x gave her unexpected power to sing. She habitually drank while singing a beverage composed of equal parts of claret and black tea.

Gottschalk's favorite medicines were phosphorus and hepar sulphur.

When vocalists feel as if they had exhausted the tonicity of the vocal cords, and it is with difficulty that they keep up the requisite respiratory efforts, a teaspoonful of the tincture of coca, or a wineglass of wine of coca, restores temporarily the weakness of voice and respiration. But Professor Sée, of Paris, says this use of the drug must not become a habit, as it eventually weakens the larynx, and renders it very sensitive.

MEMBRANEOUS LARYNGITIS.

Definition.— An inflammation of the larynx with membraneous exudation. The best authorities now recognize two forms of this disease: (1) A simple, non-specific, non-contagious affection, local in its nature and not occurring in epidemics. (2) An effect of diphtheria, in which the disease may be limited to the larynx, but most commonly is associated with exudation on the pharynx or tonsils.

Etiology.—Many authorities regard membraneous croup as always diphtheritic. I see no more reason for this opinion than that every case of membraneous mucous enteritis is diphtheritic. In my early practice I treated several cases of membraneous croup occurring in farm-houses remote from any other residence. They recovered after expelling casts of the larynx, without having a single symptom of

diphtheria, and with no sore throat, or exudation, either on the pharynx or tonsils.

Osler ("Practice of Medicine"), the highest and latest authority on pathology, says: "Provisionally at any rate, I still hold that there is a separate independent affection, a non-contagious membraneous croup."

Mitchell (Arndt's "System of Medicine"), an equally high authority in our school, says: "We do maintain from the weight of evidence, and from the combination of all the clinical and anatomical facts, that it is possible to establish an absolute dissimilarity as between croup and diphtheria."

Symptoms.— The symptoms relating to the larynx are quite similar in non-specific and specific cases. Both begin like an acute catarrhal laryngitis. The child has a cough, croupy in character, with some hoarseness, for several days, when, usually at night, the patient suddenly becomes worse, and there are signs of impeded respiration. At first the difficulty of breathing is paroxysmal, due probably to more or less spasm of the glottis; soon the dyspnœa becomes continuous, inspiration and particularly expiration are difficult, and with the inspiratory movements the epigastrium and lower intercostal spaces are retracted. The voice is husky and may be reduced to a whisper. The color gradually changes, and the imperfect aeration of blood is shown in the lividity of the lips and finger tips. At times during the dyspnœa the child has suffocative attacks, shows great anxiety and distress, will not lie covered, wants to be carried all the time, begs to be put back in bed, but soon wants to be taken up again. The cyanosis is observable on the mucous surfaces, showing the carbonic acid poisoning to be universal. The dyspnœa and the stridulus breathing are most distressing to the parents and physician. The dyspnœa is due to a spasm of the glottis. That may extend to the terminal nerve filaments of the bronchioles, and add greatly to the apnœa.

The breathing has a sibilant, tubular, and metallic quality, with a very high pitch. There is a prolonged inspiration, with a wheezing, whistling, sneezing sound, sometimes heard for a long distance. The expiration is marked, and accompanied by a rattling of mucus, and is distinguished from the sharper and sawing quality of the inspiration sound by its lower tone.

The temperature may reach as high as 103°, but is commonly about 100°. If it goes up to 104° or 105°, bronchitis or pneumonia is present. The pulse is full, hard, 120 to 130, but during the suffocative attacks may rise twenty or thirty beats; the respiration is thirty to forty or more per minute. There is a difference of opinion as to the cause of the dyspnœa. Probably no one cause, but several, both mechanical and neurotic, explain it. There may be great dyspnœa with but a small quantity of membrane, and vice versa, showing that spasm of the glottis and bronchioles play a large part in causing the difficulty of breathing. The exudate or false membrane is not very closely attached to the mucous membrane. Piece by piece it may nearly all become detached and a decided remission occur. The fever will abate, the cough become loose, the dyspnœa nearly disappear, and the sleep and appetite return. But these remissions are often delusions. The membrane has a tendency to return, and then all the dreaded symptoms will come back. Children rarely if ever survive a relapse, for the first attack has left them so weak they cannot rally sufficiently to overcome a second.

The exudate when thrown off varies from a very thin pellicle to a thick, firm, tenacious, false membrane, which may entirely block up the larynx. Cases are on record in which a cast of the larynx with a central hole the size of a pipestem only was expelled, followed by recovery. The color is yellowish white, brown, or gray; it may be almost black from extravasation of blood, streaked and dotted with minute clots.

The full duration of membraneous croup is four or five days, but it may terminate in forty-eight hours. The non-diphtheritic may last longer, because of the absence of the diphtheritic poison in the blood. There can be no absolute diagnosis, except by examining the membrane. If the bacillus of Lœffler is found, that settles the matter.

Whether diphtheritic or not, few cases of membraneous croup recover if tracheotomy is not resorted to. The literature of both schools has many alleged cures, not all trustworthy unless the membrane has been seen after the expulsion. Pieces of dry mucus or shreds of tenacious mucus are often supposed to be membraneous. The mortality is from sixty to eighty per cent (Osler); eighty per cent is nearer the truth. When it attacks robust children and is

not diphtheritic the chances are better. A very small exudation may prove fatal. Death is almost inevitable when the exudate extends to the bronchi.

Treatment.— The treatment of the two kinds of membraneous croup is essentially the same, even if we could make an accurate diagnosis, for we have no known antidote to the poison of diphtheria. Have we one or more medicines which, taken internally, not inhaled, can cause in a healthy child all the phenomena of this disease? The causation of a false membrane in the larynx by the inhalation of a caustic drug does not make it homeopathic to the disease. I believe the exudate is the external manifestation of the poisonous action of some toxic principle in the blood, and not the local poisonous action of the bacilli. Even in non-diphtheritic cases the membrane does not resemble the local action of drugs such as caustic ammonia, sulphuric acid, or nitrate of silver. It has been claimed for bromine, bryonia, cubebs, hepar sulphur, bichromate of potassium, iodine, and spongia, that they cause an exudate in the larynx closely resembling that of croup, but no post-mortem evidence has been presented in proof except those observed in animals.

Bromine has been supposed to be the nearest similimum for membraneous croup because it causes a similar exudate in the larynx of pigeons, and similar subjective symptoms in men. There have been a few cases reported which recovered under its administration. I am sorry to say that in the numerous cases of diphtheritic croup in which I have prescribed it, or observed its use in the hands of my colleagues, I cannot recall a single cure. I can say, however, that when the diphtheritic exudate appeared only on the pharynx and fauces, I think I have seen it disappear under its use. If used in true laryngeal croup, it should be given in watery solution, 1 to 1000, a teaspoonful every hour; and the air of the room should be faintly impregnated with its fumes, not strong enough to cause any irritation when it is breathed.

It was supposed that the experiments of Dr. Currie of Paris, in which he caused false membranes on the laryngeal and bronchial mucous membrane of rabbits by the internal administration of bryonia, would lead to some favorable results. Clinical experience, however, has dissipated any such hopes, as not a single case of membraneous croup has been reported cured by bryonia. Teste's asser-

tion, like all his other bold statements, that ipecac and bryonia will cure all cases of croup, is now considered not worthy of consideration. Ipecac will palliate the dyspnœa, but has no other influence except that it may render the membrane less tough, by causing it to contain more water. This it may do when given in doses sufficient to get its physiological action as an expectorant.

Iodine is more capable of causing true croupous exudation than bromine or any other drug except bichromate of potassium. Both are said to have caused membraneous laryngitis when taken internally. Iodine has been credited with a larger number of cures of this disease than any other drug, and should be used as I have advised in the case of bromine. Many of our school assert their confidence in iodine in all species of croup, and consider it the best plan to give it in all cases of laryngitis, whether catarrhal, follicular, or membraneous.

Bichromate of potassium is also given the credit of curing many cases. Its action is more intense than that of iodine, consequently we may expect the exudation to be thicker, more bloody, and to extend into the sub-mucous tissues. A study of its symptoms and pathology will show a striking resemblance to ulcerative diphtheria with tough, tenacious membranes. The 3x or 6x trituration is generally prescribed, but I know of some homeopathic physicians, once members of the dominant school, who give the 1x trituration until it causes vomiting, and assert that it not only expels the membrane, but has a better curative action in such doses. But what shall we say to the assertion of Lippe, Swan, Berridge, and others of the ultra Hahnemannian wing of our school, who claim to cure croup with the 200th or m.m. of this same drug? Shall we believe them in this, and not believe them when they assert that they cure diphtheria and membraneous croup with the highest potencies of lac caninum?

Cubebs is rarely mentioned in our books as a remedy for membraneous croup. Yet it is well known that its long continued use in large doses has caused so severe a catarrhal laryngitis, with such excessive quantity of tough stringy mucus, as almost to lead to suffocation. Some of the expectorated matters seemed like false membrane. Discredit was thrown on this statement because it appeared in Houatt's pretended provings, but he probably copied it from some

author who was the real authority. Several years ago, I found in some medical journal of the regular school a report of several cases cured by cubebs in large doses. While I have never used it in diphtheritic croup I have found the oleo-resin of decided value in catarrhal pharyngo-laryngeal catarrh, both in adults and children, when the expectoration was stringy, almost membraneous, and very difficult to detach. It seems capable of causing a catarrh like bichromate of potassium, without its lesions of mucous surfaces. I would suggest its use in the form of a vapor, made with cubeb water, prepared in the same manner as eucalyptol water, and also the internal administration of five grain doses of the 1x trituration of the powdered cubebs. Lilienthal evidently considered it worthy of mention, for he gives full indication for it in his "Therapeutics."

The above are all the medicines supposed to be homeopathic to true membraneous croup. But we should not content ourselves with their use alone. There are other medicines which may palliate and aid the action of the specifics. If the temperature in the beginning or at any time, is high (103°) with a small hard pulse, great restlessness and anxiety, aconite is useful. Gelsemium, if there seems to be spasm of the glottis, with scarlet red face and a stupor.

There are several medicines that palliate the excessive dyspnœa when not altogether due to the amount of exudation. Ipecac is useful, and has given much relief. Sambucus, bromide of potassium, bromide of gold, lachesis, aspidospermin, naja, and lobelia. This last drug was considered by the early Botanic and Eclectic schools as the sheet anchor in membraneous and other croups. In small doses it relieves the spasmodic dyspnœa as I have found in my own experience. They used it in emetic doses, and claimed that it not only made the breathing easy and free, but expelled the membranes as fast as they formed. I have no doubt that some cases were cured by its heroic use, when the child was supported by nourishing food and stimulants. In all dyspnœas even when of mechanical origin, quebracho has wonderful palliative power. It does this through its action on the nerve centres in the medulla; as the crude drug is offensive, and given with difficulty to the children, I have used the first centesimal trituration of its alkaloid, aspidospermin, in two to five grain doses every hour, with gratifying results.

Jaborandi, as is well known, causes an extremely thin, watery

condition of the saliva and other secretions of the mouth and throat. Given in catarrhal conditions, it soon renders the discharge freer and thinner. Several physicians have used it in croup with alleged good results, Dr. Doom (in "Therapeutic Gazette") writes, "I think I have discovered in the jaborandi, a sovereign remedy, if not a specific, in pseudo-membraneous croup. Five drops every half hour is just enough to keep up a free flow of saliva, and moisten the surface, thus inducing an exudation (watery) between the membrane and the trachea, preventing its formation, and loosening that already formed." Others write as enthusiastically, but the drug is depressing and should be used with caution. It can be given in non-depressing doses, yet enough to cause a free flow of watery mucus. I recommend the alkaloid, pilocarpin, in doses of one-tenth or one-twentieth of a grain, as it will have a better effect than the crude jaborandi. If the mouth and the throat of the patient were dry, I certainly should use it in such doses. If, on the contrary, the secretions were in excess and very thin, the 6x would be homeopathic. It is reported to have saved life in pulmonary œdema when given in physiological doses.

The late Dr. Thomas Nichols of Montreal, author of a most admirable treatise "On the Respiratory Diseases of Children," accords to sanguinaria the highest place in the treatment of membraneous croup. He had an opportunity of testing its value in a large number of cases one winter, and his reports were published in our Journals and in my "Therapeutics of New Remedies." He first used the sanguinarin, the mixed active principles of the root, one grain to four ounces of water, and with this he cured several cases. Then acting on the suggestion of Paine, an eclectic, he used the acetous tincture of the root,— made by dissolving twenty grains of sanguinaria, (pulverized root) in four ounces of vinegar and one ounce of syrup, the dose being a teaspoonful. This preparation became very popular with him, and he regarded it the best in use. (Lilienthal recommends acetic acid in membraneous croup.) He reported many cases of undoubted membraneous laryngitis, where the membrane could be seen on the epiglottis and pharynx, cured by this remedy alone. He recommends an acetous tincture with four grains of the root to two ounces of vinegar and one ounce of syrup, which he considers strong enough. Lately, eclectics are using the

nitrate of sanguinarin, and assert that it is superior to any other preparation. It is a powerful drug, possessing caustic properties, and acting as a violent emetic in fractional grain doses. It has been proved by Dr. William Owen of Cincinnati, and the symptoms of the pharynx and larynx were such as to leave no doubt that it is capable of causing membraneous laryngitis. This drug should be used in trituration or dilution, from the 3x to 6x, according to the age of the child, and continued until the symptoms abate.

The topical treatment of this disease has been nearly that of diphtheria. At one time, and even at the present, the vapor of slacking lime was used. The unslacked lime was placed in a jar or tea kettle, and water poured upon it. The patient was made to inhale the steam or vapor arising from it. My brother, the late Dr. P. H. Hale, cured several cases by this method, under my observation. Lime water ("aqua calcis") has been used in the same way and with good results. The vapor of lime acts by softening and disintegrating the false membrane, allowing its easy detachment. A vapor of soda, potash, or ammonia has been used in some cases with apparent benefit.

The digestive products have been tried with varying results. Good effects have been claimed for pepsin, trypsin, papayotin, Merck's juice of the paw paw, or Johnson's papoid (see Diphtheria). They act by digesting the membrane, causing it to disintegrate and loosen its hold on the mucous surfaces.

The vapors of iodine, bromine, bichromate of potassium, nitrate of sanguinarin, cubebs, and other drugs homeopathic to the pathological condition, have been used, and cures are alleged to have been made by them, but the same drugs have been at the same time given internally. Probably their topical, aided their internal use.

The nourishment of the child should not be forgotten. So long as the child can swallow, milk, and milk gruels, beef essence, mutton broth, and wine whey should be given. If the dyspnœa is sometimes so great and the restlessness so extreme that the patient cannot be fed by the mouth, then rectal feeding must be resorted to. Injections of beef tea or milk beaten up with eggs and essence of pepsin or pancreatin, should be thrown up into the colon, or enough to fill the rectum. Mosquera's beef meal is predigested and makes an excellent enema. It should be made as strong as can be injected.

Old brandy, whisky, or Hungarian tokay beaten with eggs, can sometimes be given by the mouth when no other food can. Do not delay tracheotomy or intubation too long; when cyanosis appears, be ready for one of the operations, for they have saved many lives.

BRONCHIAL OR SPASMODIC ASTHMA.

Definition.— The name asthma should be applied only to certain conditions of the bronchi which cause intense dyspnœa. The dyspnœa caused by renal, cardiac, and other diseases should be assigned to its special cause. There are several theories of the nature of asthma.

(1) That it is a neurosis, causing spasm of the bronchial muscles; or (2) turgesence of the mucosa which may be a functional hyperæmia, a vaso-motor turgesence, or diffuse hyperæmic swelling.

There are many reasons to suspect that it is due to the same condition of the system that causes hay fever. Hay asthma differs very little from any other asthma. The idea that hay fever invariably comes on in the summer is a mistake. I have had it many times during the winter months, and have known it to occur in others at any time during the year. The same condition is present in the bronchial that is present in the nasal passages; the same exudation of mucus, at first thin and irritating, then thick and glairy, and difficult of expulsion on that account. Dyspnœa is the "sneezing" of the bronchi, an affection in which the bronchi and the diaphragm are in a state of spasm.

Osler ("Practice of Medicine") points out many other resemblances, among which are causes of asthma identical with those of hay fever. It runs in families with irritable nervous systems. Men are more affected than women. A person may be free from it in the city and suffer invariably from it in the country, and vice versa. He may have attacks of it all the year in the first floor of his house and yet get rid of it by removing to the third floor. I have known a change of residence from one street to another not far away, to arrest it. Some persons have it on land, but never on board ship, or on an island. Breathing the air of a dusty or musty room, odors of flowers, hay, manure, the emanation from any animal, as the horse,

dog, cats, rats, and mice, and particularly the skunk (mephitis) will bring on a violent attack. Fright, anger, and other emotions may precipitate it.

In chronic cases, when complicated with emphysema, every "cold" brings on an attack, also every attack of indigestion, or over-eating. It is often associated with polypi in the nose, or hypertrophic rhinitis.

Salter mentions some cases which seem to alternate with epileptic attacks, both diseases arising from the same neurotic element. The division into dry and humid asthma is obsolete. In the first stage of an attack it is always dry, and moist only after the second stage has set in. The line of demarcation between bronchitis and asthma is quite uncertain. In some persons an attack of bronchitis always ends in asthma.

Generally, a paroxysm of asthma is preceded by a coryza, or dry bronchial cough. Then, often in the night, after a few hours' sleep, the patient is aroused with a distressing sense of want of breath, and a feeling of great oppression of the chest. Soon the respiratory efforts become violent, all the accessory muscles are brought into play, and in a few minutes the patient is in a paroxysm of most intense dyspnœa. The face is pale, expression anxious, speech is impossible, and in spite of the most strenuous efforts, very little air enters the lungs.

Expiration is prolonged and wheezy, the number of respirations is not much increased. The fit may last a few minutes or several hours.

In severe paroxysms signs of defective aëration soon appear, the face becomes cold and clammy, the pulse small and quick, the extremities cold, and just as the patient seems to be at his worst, the breathing begins to get easier, and after a paroxysm of coughing, he drops asleep, sometimes to wake with another paroxysm in a few hours. The cough is at first dry, and the expectoration scanty and expelled with the greatest difficulty. In a child it is difficult to diagnose this from laryngismus stridulus. In fact I believe they are essentially the same except as to the location. After many days of these paroxysms, the expectoration becomes very profuse with rattling of abundant mucus all through the bronchi. This was once called "humid" asthma.

Dr. Curschman, who discovered the condition, describes the sputum in bronchial asthma as distinctive, unlike that which occurs in any other affection. "At first it is brought up in the form of rounded gelatinous masses, the *perles* of Laennec. Though ball-like, they can be unfolded, and really represent moulds in the mucus of the smaller tubes. Microscopically many of these smaller pellets have a spiral structure. Under the microscope these spirals are of two forms. In one there is a simply twisted, spirally arranged mucin, in which are entangled cells in all stages of fatty degeneration. The twist may be loose or tight. The second form is much more peculiar. In the centre of a tightly coiled skein of mucin-fibrils, with a few scattered cells, is a filament of extraordinary clearness and translucency, probably composed of transformed mucin. These spirals are probably formed in the finer bronchioles and are the product of acute bronchiolitis. After two or three days the sputum changes entirely in character: it becomes muco-purulent and the spirals are no longer found."

In all cases of true bronchial asthma Curschman says these spirals are found. Emphysema almost invariably appears in chronic asthma, and then while the paroxysms diminish in frequency the shortness of breath becomes aggravated.

Treatment. — When called to see a patient in a severe fit of asthma, especially if it is the first one, the thing to do immediately is to quiet his fears of death and the alarm of his family. Death never occurs in a paroxysm of true asthma. It is only in cardiac or renal asthma that such a result is possible. All but one attendant should leave the room. The best ventilation must be obtained without draughts blowing on the patient. A draught from a window open only an inch from the bottom, or from a partially open door, is more dangerous than to have all the doors and windows open. In very cold weather pull the upper sash down a few inches, or push up the lower sash, insert a strip of board underneath, and shut the sash down on it. This leaves a space between the two sashes through which plenty of fresh air is driven upward, and diffused gradually through the room. If the weather is above 60°, the patient had better sit out of doors until the attack is over. It is almost impossible to "catch cold" during the paroxysm, but the moment it subsides, the patient is left with a relaxed perspiring skin, and is very susceptible to the influence of a low temperature.

The posture assumed by the patient is of great importance so far as his comfort is concerned. Asthmatics soon learn that the easiest position is sitting in a chair leaning forward upon the drawn knees. A few are obliged to stand holding something by the hands. The clothing should be loose about the neck and chest. If the attack comes on after eating to excess, give an emetic of warm mustard water; or a dose of apomorphia by the mouth or hypodermatically. Give one-tenth of a grain if there is not much accumulation of mucus in the bronchi. As the drug causes an excess of mucus, it might not be safe to give it when there is much secretion. Lobelia is a powerful emetic, and is suitable if we are obliged to give a strong one, because it possesses some especial influence over spasmodic asthma. It should not be given if the patient has a weak heart or is otherwise delicate. Notwithstanding its great depressing influence, which leads old-school authorities to warn us against it, the drug does not seem to be so very dangerous in practice. If it had been, the early "botanic" physicians would have numbered their victims by the thousands. In the early part of this century patients were dosed with lobelia sometimes daily for weeks, often to the point of extreme vomiting, and yet the deaths must have been very few or the "steam doctors," as they were called, would have been prosecuted for murder, so bitter was the feeling against them. I have known asthmatics resort to it on the first appearance of the paroxysm, and take teaspoonful doses of the tincture until profuse vomiting set in. After a short period of prostration (like that caused by acute tobacco poisoning) all the dyspnœa disappears and the patient quietly sleeps. The hot infusion of the seeds was the favorite method of administration. Ten to twenty grains of the powdered leaves or seeds were infused in a cup of water and the whole taken at once. It causes prompt and thorough vomiting. I know of no drug that will cut short a fit of asthma unless it be lobelia. Probably an infusion of tobacco seeds or leaves would have about the same effect, but the tobacco would be the more depressing and dangerous of the two. I write as I do, not because I am in favor of the drug, or use it, for I never prescribe it as an emetic in an asthmatic paroxysm, but I think old-school writers are unduly prejudiced against it and have exaggerated its dangers. If it is not necessary to evacuate the stomach, lobelia in ten-drops doses every half hour will certainly

shorten the duration of the paroxysm. I use the following formula:

℞ Tinc. lobelia . . . . . drm. i.
Chloroform water . . . . . oz. i.
Give a teaspoonful every half hour or oftener until relieved.

There are some remedies that act quicker than lobelia. Nitrite of amyl will lessen the severity of the fit in a minute or less. If the hands and face are cold and bathed in cold sweat, the heart's action feeble, and the spasmodic constriction of the bronchi severe, a few whiffs of amyl will relieve in an incredibly short time. If the depression is not severe, inhaling a few drops of chloroform will have a prompt, favorable effect.

Glonoine or nitrate of soda is better when we desire to get more lasting results. Dr. Pierce ("Practitioner," March, 1891) gives of the latter three or four grains, repeated every hour or two. In some cases I have injected under the skin one-fourth of a grain of morphine with one-hundredth of a grain of atropine.

Osler advises cocaine instead of atropine, and says it has proved very satisfactory in obstinate recurrent cases (one-eighth of a grain of morphine with one-fourth of a grain of cocaine). A common remedy, and one that generally gives prompt relief, is the fumes of nitre. Soft, bibulous brown paper is soaked in a saturated solution of nitre (saltpetre); this dry paper, while burning, gives off fumes that soon relieve the oppression of the chest and the laborious breathing. If a decoction or tincture of stramonium is mixed with the nitre, it renders the fumes more antispasmodic. Cigarettes made of this medicated paper and smoked prove quite as effective, and are preferred by many patients.

Some of the severest paroxysms I ever treated were quickly relieved by ten to twenty grains of hydrate of chloral; if the heart is weak, chloralimid is safer, as it does not depress the circulation. Opium will relieve a paroxysm very quickly in some persons, but it should be used only in an emergency; the best form is "paragoric" (tinct. opii. camph.). In the early pharmacopœias this was known as "elixir asthmaticum," and when first introduced was used almost altogether for asthma. In the asthma of women and children it is as good a palliative as we can use.

A prominent writer in "Arndt's Practice" says, "Attacks usually yield readily to the indicated remedy." If he means that we

can surely and quickly cut short an attack of asthma with attenuated medicines his experience is not like my own. I have never observed that our attenuations arrested or greatly relieved a paroxysm. We should carefully distinguish between a spontaneous subsidence of a paroxysm of asthma, and an arrest of it by medicines. We get a great deal more credit in such cases than we deserve. A paroxysm will last but a few hours anyhow. If we administer a medicine and have to continue it for several hours before decided relief comes, the drug has had no curative influence. If we are called towards morning to a patient who has been suffering in a paroxysm since midnight, our prescription may be followed in a very short time by complete relief; but the subsidence of the attack was spontaneous, and would have occurred without the use of medicine, just as a paroxysm of croup subsides suddenly, after lasting an hour in the night.

We cannot claim to have made a cure of asthma until we have prevented its occurrence for months and years, and that is a very difficult thing to accomplish. There are very few medicines capable of this result.

Arsenic is the drug most likely to effect a real cure of asthma. I need not enumerate the symptoms which indicate it, for it has in its pathogenesis nearly all the typical symptoms of asthma. It is the only drug I can conceive of, capable of causing a bronchiolitis, which is supposed to be the essential lesion in true asthma. It corresponds to the nocturnal periodicity and the neurotic nature of the malady. In all the cases of chronic arsenical poisoning we see the asthmatic and bronchial symptoms stand prominently forward. An apparent contravention of this statement is the familiar story of the arsenic eaters of Styria, who gain great powers of endurance in mountain climbing, and labor in high altitudes. Its use there is traditional, just as is the use of coca by the mountaineers of Peru, and when taken to relieve the breathing rendered difficult by the rarified air, the system becomes capable of tolerating its use in large doses. But the arsenic eater cannot stop its use; he has to continue it until he dies. If he does not he suffers from all the symptoms of arsenical poisoning. Women who grow plump, and get a pearly skin from its use, grow thin, scrawny, sallow, and in every way unlovely when they cease to use it.

Arsenic cures asthma not so much by its local specific action as

by its general effect on the nutritive and reparative functions. It may be called a tonic to the nervous and digestive systems. It cures asthma as it cures chorea, neuralgia, degeneration of the mucosa of the stomach and bowels, by the profound influence it exerts on the nervous tissues. It is of no value in the paroxysm itself, but must be used continuously for weeks and months, or until the asthmatic tendency is removed. I have had the best results from its use when, beginning with one drop of the 1x of Fowler's solution after meals, the dose was increased by one drop at each time until thirty drops were reached; then decrease in the same ratio until the first named dose is reached. Then suspend its use for a week and go on again. In this way a radical cure may be attained. Other appropriate medicines may be used for the recurring attacks or complications, without interfering with the action of arsenic.

The only other remedy which can compare with arsenic is iodide of potassium, and it is probably the iodine which is the curative agent. The chief diagnostic difference between arsenic and iodine in asthma is, that arsenic is more useful in asthma with dry bronchitis, while iodine acts better when mucous rales are present, or in "humid" asthma. The best method of giving iodide of potassium is to begin with one grain (one drop of a saturated solution), and increase by one drop until ten drops (grains) have been reached, then decrease the dose in the same ratio. It acts best when taken in Vichy water, milk, or any alkaline water; and should be given three hours after meals. Dr. Salter, the highest authority on asthma, says it will cure about one case in five of chronic asthma. He says it has to be continued for a week or two before any beneficial results are seen. He reports several typical cases cured by this drug when all other medicines that had been tried for many years had failed.

It may be beneficial in some cases, for meeting certain symptoms, to use the arseniates and iodides. The arseniate of gold for children, when asthma is accompanied with laryngismus stridulus (3x trit.). Arsenite of antimony 2x when there is pulmonary congestion and a weak heart, together with prominent antimonial symptom. Arseniate of strychnine 2x when the muscular tone is very low, particularly when the respiratory muscles are weak (one tablet four times a day for a week). Arsenite of copper when the cuprum symptoms are pre-

dominant. Arseniate of iron in anæmic girls, who have attacks of dyspnœa on slight exertion.

Ipecac, tartar emetic, and tobacco are praised only as palliatives by Dr. Salter, and he asserts that no relief ever comes from these drugs until nausea sets in. This is my experience, and I believe all close observers will agree with me. Notwithstanding the professed cures with high potencies of ipecac, I do not think the same can be said of lobelia, for it seems to have some power of relaxing the bronchial spasm without causing nausea. Salter, however, ranks it with tobacco. I have never seen any strictly curative effect from the medicines mentioned in Arndt's "Practice" or "Lilienthal's Therapeutics," except the following:

Aralia, introduced by Dr. S. A. Jones, has been of undoubted benefit in hay asthma, but not in true asthma.

Cuprum is of real value in uncomplicated spasmodic asthma, *i.e.*, when the spasmodic character over-shadowed all the other phenomena, and were not local but extended all over the body, especially to the hands and feet.

Case.—Nearly forty years ago, during the first years of my practice, I was called to see a woman aged twenty, and when I arrived she was suffering the agony of a paroxysm of spasmodic asthma. She was very fat (adipose), and was supposed to have heart disease. I found her sitting in a chair, her hands grasping the arms, her face livid and bloated, her eyes protruding, and laboring fearfully for breath. The heart was beating violently but irregularly; these attacks had appeared daily or nightly for several weeks. She had been vomited with lobelia, and had been dosed excessively with other drugs. She presented such a complete picture of cuprum symptoms that I gave her cuprum metalicum 6x trituration, a grain every half-hour. In a few hours the paroxysm subsided. The medicine was continued every three hours, and for several days she was better, after which the paroxysms recurred. Then I tried arsenicum 8x with the same results. Still believing cuprum to be the remedy, and mistrusting the value of the metallic copper, I decided to try the arsenite of copper, although I had never heard of it being used as a medicine. Procuring the crude drug I made a 1x trituration, and prepared it for use by dissolving two or three grains in eight ounces of water, directing a teaspoonful of it to be given every three hours. Four

days afterwards I saw the patient and found her cured. She had no attacks until six months after, when the same medicine cured promptly. I believe I was the first to use this drug in medicine. Since that time I have cured many cases of asthma with it. (I afterwards examined the woman's heart, but found no lesions.)

Cannabis indica, cocculus, moschus, platina, sabal, and asafœtida, will cure only hysterical asthma. I will now mention some indigenous drugs that have attained considerable reputation in asthma.

Eucalyptus, grindelia, euphorbia pilulifera, enothera, guarana, piscidia, lippia, quebracho, hoangnan, yerba-santa, and silphium.

When profuse bronchorrhœa has been checked by a cold, and asthmatic attacks are impending, eucalyptus, by restoring the expectoration, will prevent them. It is a grand remedy for arrested discharges from mucous surfaces. In this respect it is a rival of gelsemium.

Euphorbia pilulifera was first introduced as a remedy for asthma by Dr. Matheson of Queensland. The natives make a decoction by boiling a "handful" of the herb in two quarts of water until the quantity is reduced to one quart. This is given in small quantities until the patient gets relief. Dujardin-Beaumetz, who experimented with this drug on animals, says it causes death in the same manner as does section of the pneumogastric. It kills them by arrest of the respiratory movements and the cardiac pulsations. It seems to act directly on the respiratory and cardiac centres. It gives relief to dyspnœa caused by spasmodic asthma, by its action on these centres. In the "Pharmacology of the Newer Remedies," several hundred cases of asthma are reported, in all of which the use of this drug was attended by very favorable results. Nearly all these cases were typical, and nearly all had some emphysema. They had teasing cough in paroxysms, nocturnal attacks of all degrees of severity, could not lie down in bed, wheezing respiration all the day; the expectoration was viscid, muco-purulent, frothy, and ropy. Nearly all had chronic bronchitis. All the patients had been dosed with iodide of potassium, ipecac, lobelia, antimony, and many other remedies, without good results. There could be no error about its prompt effect, for many were relieved in half an hour after taking the first dose, and when given during the day (ten drops every two hours) the usual

nocturnal paroxysms were prevented. If given during the paroxysm, twenty to sixty drops of the tincture, or its equivalent, were given at one dose. It seems to possess anodyne and narcotic quantities to some degree.

Œnothera biennis was at one time praised very highly by Dr. N. S. Davis, of Chicago, as a remedy for asthma associated with gastric catarrh. He reported twenty cases in which the drug acted very efficiently. Other physicians reported cases of hay asthma, and angina pectoris, in which it gave good results. The dose was fifteen to thirty drops every three or four hours.

Grindelia robusta is one of our indigenous drugs that is rapidly attaining a high position among the remedial agents for asthma and its allied diseases. The experiments made in the laboratory of Jefferson Medical College show that it acts on the motor nerves, first by paralyzing the peripheral end, then the trunks, and finally the motor centres in the cord. The heart is slowed because of an increase of inhibition, due to stimulation of the cardiac inhibitory centre, and the blood pressure is raised chiefly by stimulating the vaso-motor centre in the medulla. The respiration is increased in frequency by its action on the respiratory centre, and also on the terminals of the pneumo-gastric in the lungs. It appears to act directly on the cerebral cells, causing narcosis. It also increases the secretion of urine. Small doses quicken the action of the heart and elevate the blood pressure, secondarily slowing the heart, and at the same time the arterial tension falls; large doses dilate the arteries. In toxic doses we have in grindelia a cardiac paralyzer. It acts in the same manner on the respiratory functions. This gives us a clue to its clinical uses which it is well to bear in mind. It is primarily indicated in minute doses when there is congestion of the bronchial mucosa, with slight expectoration, and some embarrassment of breathing, with increased action of the heart and slight fever. In large doses it is useful when there is a profuse secretion from the bronchi and bronchioles, with impeded respiration; and later when there is abundant expectoration, with violent coughing, spasmodic action of the bronchi, and veritable paroxysms of dyspnœa.

It has been found curative in these conditions in so many instances that it is now considered almost specific in true asthma. The paroxysms occur between midnight and 2 A. M., and last several hours,

and are attended by a severe convulsive cough. To make matters worse the action of the heart becomes weak and irregular, and this feebleness of the circulation increases the distress of the patient. There is no structural disease of the heart in such cases, but the functions of the cardiac centre in the medulla are depressed. It has one symptom of importance, a "key-note" which leads to its selection: "A fear of going to sleep on account of loss of breath, which awakens him."

(Grindelia squarrosa has exactly the same symptom.) Many asthmatics with a weak heart and feeble respiratory nerve centre suffer greatly from this symptom. (The secondary effect of strychnine is similar.) Both are of value by their power in small doses to stimulate the motor nerve centres of the heart and of respiration. It is one of our most trustworthy remedies in cardiac asthma when there is impeded aëration, carbonic acid asphyxia, cyanosis, and threatened heart failure. It acts on the kidneys also, and I have found it superior to digitalis or strophanthus, because while it restores the rhythm and force to the heart, it acts on the cough and asthma, and encourages the urinary secretion.

Several hundred cases are well reported in the "Phar. Newer Remedies," illustrating its curative action, and what is unusual and praiseworthy, the medicine was in most cases given alone, which adds greatly to the value of the clinical reports. It can be prescribed in tincture, tablets, pills, and fluid extract. The tincture should be hydro-alcoholic, for not all its properties are taken up by alcohol. It is most acceptable to patients in the form of an elixir, or syrup, one drachm to one ounce, the dose varying from ten to sixty drops according to the age and nature of the case. In asthma I order the selected dose every two hours during the day, and every fifteen minutes during the paroxysm, if it recurs.

Grindelia squarrosa has not been tested in asthma, but it should be useful in some cases, as it causes the key-note symptoms of G. robusta.

Piscidia is useful as a palliative remedy. In several cases after the intensity of the paroxysm had decreased, the patient could not sleep, and begged for some hypnotic; morphine and chloral were inadvisable owing to a weak heart. Piscidia is not contra-indicated in such cases, and I found that twenty drops caused the patient to sleep calmly and soundly.

Eryodictyon and lippia have been used with alleged success in asthma, but the clinical reports are almost valueless, because the drugs were used in combination with others. I think I cured one case with lippia, and two with eryodictyon, at least they gradually improved under their use, until I lost sight of them.

The *diet* in cases of asthma, or those subject to it, must be light and digestible. No big rich dinners with wines and malt liquors. This is one of the few diseases where eating on going to bed is not permissible. The last meal of the day should be three hours before bedtime. An attack of indigestion is pretty sure to bring on a paroxysm. Strong black coffee drunk on an empty stomach will ward off a paroxysm, but if taken after meals will cause it. Dr. Salter has the following remarks on diet in asthma:

"And now let me say a word or two about those peculiar articles of diet that have a special tendency to oppress and tighten the breathing of those liable to asthma. They are not the same in all cases; but those that I have found have this tendency most commonly are the following: Anything in anyway preserved, especially if strongly impregnated with antiseptics, whether condimentary or saccharine, such as potted meats, dried tongue, sausages, stuffing and seasoning, preserved fruits, such as one gets at dessert, *e. g.*, preserved ginger, candied orange peel, dried figs, raisins, especially almonds and raisins (a vicious combination). Cheese is bad, especially if old and decayed; nuts are worse. With regard to cheese I remember hearing an asthmatic remark that there was 'as much asthma in a mouthful of decayed Stilton as in a whole dinner.' Meat pies are very 'asthmatic,' and so, in a peculiar degree, for some reason or other, are beefsteaks and kidney puddings. I have known more than one asthmatic condemn them as being very bad. Coffee, although of great benefit in some cases as a stimulant, is from its indigestibility, especially if taken strong, and with sugar, so bad for asthma that it deserves to be classed among its special provocatives. I know the case of a gentleman whose dinner making him asthmatic or not entirely depends on his taking, or abstaining from, the customary post-prandial cup of coffee. Heavy malt liquors, especially those containing a good deal of carbonic acid gas, as bottled stout and Scotch ale, are of all drinks the worst for asthma."

The selection of climate and place of residence for asthmatics

depends on several factors. High altitudes are generally recommended indiscriminately, but this is an error. If emphysema exists, such locations do more harm than good. If it is not present, or but slight, the high arid regions of Colorado, California, Arizona, New and Old Mexico are to be selected. I have known many cases do well at Mackinaw, Ashland, and around Lake Superior. All damp cold places should be avoided as a residence. I am informed that since the introduction of irrigation to a large extent in the West, asthmatics do not do so well there. If emphysema is present, the Gulf States, particularly lower Florida, are best. I know of many confirmed asthmatics who are absolutely free from it so long as they remain in Florida, but if they return to the Northern States on a visit they suffer from it. The West India Islands are excellent resorts. Nothing is more curious than the effect of change on asthmatics. Dr. Salter narrates many cases of confirmed asthmatics who come to London for advice, or to reside. So soon as they reached that city the attacks ceased and never returned. I have known a great many persons from country towns or farms come to Chicago with reluctance, fearing their asthma would be worse, but were delighted to find complete immunity. Dr. Macaulay once said, "It is impossible to predict except by trial what air will suit an asthmatic. The fact nearest the truth appears to be that whatever air the patient may be in, you should try the exact opposite." Dr. Salter mentions many singular instances where patients living in the pure air of the country, or in the best part of London, on being obliged to remain over night in the smokiest, dustiest, foulest, and closest air of that city, had in such places no attack of their asthma.

I have observed the same examples in Chicago. I have had asthmatic patients, born and residing in Denver, come to consult me, who, while here, were perfectly free from asthma.

Sea air will give relief to some asthmatics, while others residing by the sea have it all their lives. Dr. Salter concludes his remarks on change of air as follows: "Possibly there is no case of asthma that might not be cured if the right air could only be found," but he says they cannot go back to their original air, or the disease will surely recur.

Dr. Nuñes, of Rio Janeiro, Brazil, being dissatisfied with the

use of the tincture of lobelia in asthma on account of its nauseous taste, which was objectionable to his patients, concluded to test the alkaloid lobeline. Dr. Nuñes commenced his experiments with the administration of lobeline in doses of one-sixth of a grain, given at long intervals, while all other treatment was suspended, and gradually increased the quantity given until six grains were given to asthmatics without producing any toxic effects. The tolerance for this large dose of lobeline, claimed by the author to exist in asthmatics, is attributed by him to the excited condition of the nervous system, in which he finds the primary cause of the asthmatic affections Lobeline, according to Dr. Nuñes, may be administered subcutaneously without producing any local reaction, and he advises its use in this manner where an immediate effect is desired. The author publishes tolerably full notes of nine cases of asthma in which lobeline, in doses varying from three-fourths of a grain to six grains, seemed to produce decided relief from the asthmatic symptoms, and he terminates his memoir with the following conclusions: (1) Lobeline does not possess the toxic effects generally attributed to it in the doses which he recommends; (2) it possesses no emetic or nauseating properties, as is the case in lobelia, and its employment is, therefore, preferable where lobelia is indicated; (3) he has employed it in doses of from three-fourths of a grain to six grains daily for adults; for children, one-sixth to three-fourths of a grain; (4) it has no irritating action on the cellular tissue, and therefore may be administered in hypodermic injection, a fact which renders it more preferable than the tincture of lobelia; (5) the evident action of lobeline on the nervous system would seem to indicate its employment in other convulsive affections, such as tetanus; (6) the cases in which he has employed lobeline have remained permanently cured.

BRONCHITIS.

There are several forms of this disease, and they differ so much in their pathology that they require separate consideration. The varieties are:

(1) Acute Catarrhal Bronchitis; (2) Chronic Catarrhal Bronchitis; (3) Capillary Bronchitis; (4) Dry Bronchitis; (5) Fœtid Bronchitis; (6) Croupous Bronchitis.

ACUTE CATARRHAL BRONCHITIS.

This is generally but an extension of an acute nasal or pharyngeal catarrh downward through the larynx to the bronchi, but I have known many cases in which it commenced in the bronchi and extended upward until it ended in the nasal passages.

The treatment differs but little from that of an ordinary coryza, for the same remedies which affect the nasal mucous membranes affect similarly the bronchial. The patient, as soon as he feels the irritation in the chest, with the cough, the constriction, and soreness, should keep in-doors if the weather is cold, and keep the air of the room warm, 70° to 75°, and moist. This is important, and can easily be done by placing a pan of water on the register or stove, or over a gas burner. The water may be medicated by putting in it a few drops of iodine, eucalyptol, or terebene.

Osler ("Practice of Medicine") mentions the prevalent habit among some physicians of prescribing quinine in the beginning of such cases, and asserts that its value is very doubtful. I know it to be injurious, for I have seen severe aggravation follow quickly after the first dose. He protests against the practice of Turkish baths, and his experience is like my own, that the worst cases occur after taking these baths.

There are a few medicines which should be added to those mentioned under coryza, namely, iodide of antimony, tartar emetic, eryodictyon, grindelia, phosphorus, and squills. Iodide of antimony is particularly useful when the whole chest seems raw, and the constrictive sensation is notable. If the temperature is over 100° alternate it with aconite. Tartar emetic is useful for nearly the same symptoms, but the heaviness on the chest is not a prominent symptom.

Eryodictyon (yerba santa) is suitable when the harassing cough brings up a little glairy mucus, and there is some fever.

Grindelia is useful in asthmatic subjects who tell us "if this is not checked right away it will run into asthma." The cough is at first dry, then wheezing without much expectoration.

Scilla (squills) is one of the most useful medicines in acute bronchitis, because it causes almost identical symptoms, even to the preceding coryza. It is much neglected by our school, probably because we are prejudiced against it on account of its abuse by our old-school

colleagues, mothers, and nurses, who give it in nauseating and pathogenetic doses. Hahnemann says its primary effect is to increase the secretion of the bronchial glands and cause profuse expectoration, but its secondary to dry it up, causing fever and painful cough with no expectoration, *i. e.*, if used in large doses. I shall refer to its dangers when treating of capillary bronchitis. In catarrhal bronchitis the low dilutions are very useful, preventing profuse expectoration. One indication for scilla often guides me in its selection—the profuse watery urine which scalds. This in children often accompanies acute catarrh of the bronchi.

Phosphorus is so favorably known in this disease that I need only mention it. The soreness and rawness in the chest is the guiding symptom.

Æsculus, bryonia, hyoscyamus, hepar sulphur, iodine, drosera, sticta, sanguinaria, spongia, sulphur, lobelia, jaborandi, ipecac, cocillania, and euphorbia pilulifera are all useful. The two last resemble ipecac and squills. (See "Pharmacology of the Newer Materia Medica.")

CHRONIC BRONCHITIS.

Definition. — A slow, subacute form of inflammation of the mucous membrane lining the bronchial tubes, tending to recur from various exciting causes. It is generally a disease of adult life, rarely occurring in children except after measles and whooping cough. The majority of cases occur in old people; men are more subject to it than women. It has most of the symptoms of the acute form, the substernal pain, dyspnœa, cough, and expectoration. Its various manifestations have received the following names: bronchial irritation, bronchorrhœa, winter cough, and fœtid bronchitis.

"*Winter Cough*" is the commonest variety. The patient does not cough much during the summer, but in the fall, when cold and dampness set in, slight paroxysms occur, which gradually become more severe as the season advances, and the coldness and dampness increases. The coughing is usually worse at night, and when the air is loaded with dust and vapor. The expectoration may be scanty and mucous, or profuse and muco-purulent, white, frothy, gray, slate-colored, yellow, green, and sometimes streaked with dark blood.

There is but little fever, and then a rise of only a degree or two towards evening. There is not much emaciation and the digestive processes are not much deranged. If the patient is asthmatic the dyspnœa is considerable until the expectoration is free. Biliousness aggravates the disorder.

"*Dry Cough*" is but another form, in which the expectoration is scanty owing to some obstacle to the secretion of mucus. The irritation may be so intense as to excite severe paroxysms similar to whooping cough. They cause great soreness in the chest and inter-costal muscles.

"*Bronchorrœa*" generally occurs in old men and women. The paroxysms are very severe, not as in dry cough, because of the scanty expectoration, but from the opposite — the great quantity of secretion. This may be enormous, as much as four or five pints daily, and it is tough, stringy, tenacious, and may be frothy and bloody when the expulsive efforts are severe. The patient will not cough as much at night as would be supposed, but he commences in the morning after eating, and the effort to dislodge the mucus often causes vomiting of food. Sometimes the cough commences on rising, and a pint or more is expectorated before breakfast.

"*Fœtid Bronchitis*" does not differ essentially from bronchorrhœa, except as to the offensive odor, which is probably caused by the decay of crypto-organisms, sporules, or fungi, in the dilated tubes. The breath of the patient is generally fœtid. There is some fever of a hectic character, followed by night sweats in debilitated subjects. This variety is often supposed to be caused by vomicæ or cavities in the lungs.

Treatment.— Before entering into a consideration of the medicines to be selected as curative remedies we will inquire into the action of drugs on the bronchial tubes and their lining membranes.

A large number of drugs will cause cough, but in different ways. A few cause it by their irritant action on the nerves and their peripheral endings in the bronchial mucous surfaces. These drugs rarely cause primarily any expectoration. When the expectoration appears it is secondary, owing to the bronchial irritation excited by coughing. These medicines are aconite, arnica, arsenic, belladonna, hyoscyamus, lactuca virosa, lachesis, naja, stramonium, agnus, calabar, cannabis, causticum, codeine, quinine, morphine, opium, con-

ium, cuprum, drosera, kalmia, laurocerasus, nux vomica, œnantha, phellandrium. The cough is always at first dry, continuous, or paroxysmal. The expectoration is secondary, with the nervous element persistent. These drugs nearly all cause an actual dryness of the mucous membrane. If a cough with profuse expectoration suddenly changes to a dry cough, it is because congestion or inflammation has set in. Quinine or opium will check a profuse expectoration by producing a dryness and congestion that arrests secretion. After the dryness and congestion subside, expectoration sets in as a reaction of the organism to restore the normal mucus, but the reaction sometimes goes beyond that, and abnormal secretion obtains.

In the treatment of dry coughs the pathogeneses of the above medicines must be consulted in our "Materia Medica," aided by such repertorial works as Dr. E. U. Jones on "Dry Cough" (now I fear out of print), or Worcester's "Cough and Expectoration." In prescribing them homeopathically we should avoid giving doses large enough to cause dryness of mucous surfaces, but just enough to act as a sedative to the nerve-endings in the bronchi. If the previous element is coincident with a loose cough, the dose may be larger than in the dry variety. Rarely if ever should morphine or opium be given to suppress a cough suddenly, be it loose or dry.

Instead of the special indications for each medicine, I will give my experience with those that have yielded me the best success. It is certainly the experience of my readers that in the treatment of obstinate cough, the patient often clings to the old-established custom of the use of "cough syrups," lozenges, and "cough drops." If we do not prescribe our medicines in some such form they will openly or secretly purchase some one of the proprietary medicines or nostrums kept by all druggists. If they were all harmless it would not so much matter, but as all contain opium in some form they derange the stomach and nervous system, and often lead to the opium habit. These nostrums also generally contain tartar emetic or ipecac, which set up gastric irritation. Is it not more professional for us to insist on prescribing syrups and lozenges after our own formulæ? We can do this without violating our law of cure, or our pure pharmacological methods.

Pure syrup made from cane sugar, rock candy, or licorice sugar is as legitimate as sugar of milk. It is a fact that medicines given

in these vehicles often act better than in cones, powders, or water.

The most satisfactory remedy for a dry, nervous cough is hyoscyamus, when the mucous surfaces are dry, or when there are paroxysmal attacks of cough severer than the amount of expectoration warrants, and when the cough is worse at night and will not allow sleep. A few drops or discs of the 2x or 1x dilution often act admirably, but not always. In children and old people, who bear and require larger doses of this drug, it is often necessary to give two to ten drops of the tincture several times during the day, and at night. The following formula has been very successful:

℞ Tincture hyoscyamus . . . . . drm. ii.
Syrup rock candy . . . . . oz. iv.
Dose, one teaspoonful.

If a lozenge is thought more convenient any good druggist can prepare one:

℞ Extract hyoscyamus . . . . . gr. v.
Extract licorice . . . . . gr. xxv.
Sugar of milk . . . . . gr. xxv.
Make fifty lozenges; dose, one every two or three hours.

For the severe nightly paroxysms of old people, five lozenges on going to bed is not too large a dose.

In testing the value of hyoscine and hyoscyamine, I found that the 1-500 grain (tablets), repeated every few hours, had about the same effect on cough as five or ten drops of the tincture.

Next in value I estimate lactuca virosa. This is not the common garden lettuce, for cultivation has deprived it of nearly all its medicinal qualities. It is prepared in France, in the Province of Limoyne, from the lactuca virosa altissima (gigantica), supposed to be the ancestral plant of the edible lettuce. The milky juice is used, which is obtained by making incisions in the stalk at the time of flowering. It has been supposed that its effects were like opium, but so mild that it was banished from the regular Materia Medica. Aubergier, of France, rescued it from disuse by preparing it from the gigantic lettuce, cultivated under his directions. Lactuca elongata, an indigenous American species, grows wild to the height of six or eight feet, and has an abundance of milky and very bitter juice. It ought to be more medicinal than European species. T. F. Allen says ("Encyclopedia Materia Medica," p. 487), "It is now used in making lactucarium." The most elegant preparation is the syrup of lactuca-

rium prepared by Aubergier, of Paris. I see no reason why our pharmacists cannot make a syrup equally elegant from our native species. A study of its symptoms shows it to resemble hyoscyamus more than opium. In fact it has lately been discovered that it contains hyoscyamine. The following are the guiding symptoms of lactuca: "Incessant spasmodic cough which threatens to burst the chest, always caused by a peculiar tickling in the fauces, which in turn seem to be produced by a sense of suffocation in the throat. A too large dose changes an easy loose cough to a dry barking and painful one." "Dry cough in short paroxysms, with shaking of the chest and shocks in the occiput; hollow dry spasmodic cough. Great tightness in the lower portion of the chest. Wakes suddenly at night with anxious tightness of the chest." Lilienthal says "the cough is caused by a spasmodic irritation of the nerves of the larynx and pharynx." A copious mucus expectoration appears when the cough has lasted a long time (secondary effect).

Discs saturated with the tincture or 1x are often efficient, but I prefer the syrup made from the extract, or a good tincture of lactuca elongata. Teaspoonful doses, from a mixture of one drachm of the tincture or one grain of the extract to an ounce of syrup, four times a day, and as often at night, soon control the worst cases. If given for the frequent, deep-seated, convulsive cough of consumption that prevents sleep and eating, it keeps it under control, making the sufferer quite comfortable. As the symptoms indicate, it is useful in whooping cough, and the cough of nervous asthma. I know of no cough remedy so pleasant and grateful to children, for those aggravating nocturnal and often diurnal coughs which by their persistence and strident noisiness madden the whole household. Here Aubergier's syrup is a great boon. In incurable consumption I often add five or ten grains of phosphate of codeine to each four ounces. If we must use opium at all as a palliative in obstinate cases, codeine is the best form, in doses of one-tenth or one-fifth grain.

A good formula for a mere palliative is:

℞ Paregoric . . . . . oz. ii.
Chloroform water . . . . . oz. i.
Syrup . . . . . oz. i.

A teaspoonful every hour or two.

Belladonna can be prescribed in the same manner as hyoscyamus, giving about one-half the dose.

Ambergris somewhat resembles lactuca. It is an excellent remedy for purely nervous spasmodic cough in hysterical children and women.

Apis causes a constant harassing cough, with stinging in the air-passages. It may be purely nervous, or due to a watery swelling of the glottis, or slight œdema.

Rumex crispus is the typical remedy for the real dry bronchitis, when the hyperæsthesia coincides with a scanty expectoration. It has several congeners from which to choose. Carroll Dunham's masterly comparisons of remedies can never be excelled. His only equal in that specialty was the lamented Farrington, while the so-called comparisons of Gross and Kent are hair-splitting and illogical. Dunham compares rumex with belladonna, lachesis, phosphorus, and causticum, and says: "It (rumex) stands preëminent in respect to the extreme sensibility of the larynx, trachea, and bronchi; it should be studied." I have quoted his comparisons, showing the resemblance and difference of these five drugs, on page 695 of my "Therapeutics of New Remedies," and it may be found in "Dunham's Lectures." The cough of nux moschata, corallium, nickel, platina, stannum, and zinc, I believe to be primarily purely nervous. The cough of stannum is nervous, and the profuse muco-purulent expectoration is a secondary bronchorrhœa, while the bronchorrhœa of copaiva and others of its analogues is primarily catarrhal.

A syrup of the juice found in the leaves and stalks of verbascum (mullein) is a good remedy for nervous cough. The cough is deep, hollow, hoarse, "sounding like a trumpet," and occurs during sleep without waking the child.

This cough has been mentioned by some authorities as denoting sensitive areas in the naso-pharyngeal spaces. The tincture in five or ten drop doses or a spray of the extract in water can be used with benefit.

Bronchorrhœa, when it has no predominant nervous element, requires altogether different class of drugs which contains oils, oleo-resins, or a volatile oil. These medicines act through the channels of the circulation.

Hahnemann and some of his radical disciples teach that the action of drugs is dynamic, meaning of an imponderable, immaterial force. This theory must be discarded. The idea of a dynamic force

is abandoned by all scientists. There is no dynamic force except that exerted by the human soul. Medicines, even in the minutest quantity, act on the animal organism by means of their ultimate molecules coming in contact with the various tissues of the body. The medicines alluded to in the foregoing observations are of that class, principally from the vegetable kingdom, known as "expectorants." They are abies, ammonium, antimony, arum, asafœtida, bryonia, coccus cacti, cocillaria, chekan, copaiva, cubebs, eucalyptus, euphorbia pilulifera, gurjun, lippia, lobelia, myrtus, pulsatilla, sambucus, sanguinaria, scilla, senega, senecio, sabal, silphium, turpentine, tartar emetic, balsam of tolu, and balsam of Peru. All the iodides belong to this class. All these drugs, when taken into the stomach, are absorbed, carried through the system, and excreted through the skin, respiratory organs, and kidneys. They pass out in the sweat, urine, breath, and feces, but their main exits are through the bronchial and renal mucous surfaces. Those of the above that contain volatile or fixed oils, namely, abies, asafœtida, chekan, gurjun, copaiva, cubebs, eucalyptus, myrtle, balsam of Peru, sabal, senecio, erigeron, cajuput, turpentine, silphium, and others, can be discovered by their odor in the expired air of the patients, even when given in small doses. This quality makes them especially valuable, for in passing out of the body they pass through the diseased tissues, and act better than if sprayed upon them.

The other medicines of that class have the same exits, but do not change the odor of the breath, although they are found in the expectoration. If any of my readers suppose that they act through the nervous system, let him dismiss the idea; the action of all of them is due to the fact that their atoms or molecules pass over and through the diseased tissues.

Brief indications of these medicines must suffice.

Abies. The spruces contain an oil analogous to turpentine, and have been used in domestic practice for old coughs.

Allium (garlic) is highly praised by Teste ("Materia Medica") for bronchorrhœa, and is used for that purpose by the French and Spanish. Its guiding symptom is "a morning cough after leaving his bedroom, with extremely copious expectoration." "Continual mucous rales in the bronchi, and great difficulty in expectorating a glutinous mucus, with oppression of the chest at night."

Asafœtida has similar symptoms, and I have found it very successful in old people who have bronchorrhœa and are nervous and hysterical. A pill of one or two grains every three hours acts very satisfactorily.

Copaiva for a profuse, muco-purulent, easy expectoration, is one of the best medicines that I ever used. I once reported eight cases, which had been pronounced consumption, all cured in a few weeks with ten to fifteen drop doses of equal parts of balsam and alcohol. I now use it on sugar discs, each one containing two minims, or in the capsules which contain five to ten drops. From ten to sixty drops can be given daily without causing nausea or a rash.

Cubebs has different symptoms. The expectoration is more difficult, and is composed of stringy white or gray mucus. The dose of the oleo-resin is the same as that of copaiva.

Cajuput oil is used by the natives of India for chronic bronchitis.

Dipterocarpus (Gurjun balsam) is obtained from a tree in eastern India. It resembles copaiva in medicinal action, but is less nauseating and causes no rash. Dr. William Murrell, in the "London Lancet," praises it very highly in chronic purulent bronchitis. He prefers to prescribe it in malt (two drachms to four ounces), a teaspoonful every two hours. He says it "clears out the chest and eases the cough admirably."

Myrtus communis yields an oil called myrtol, which is said to be a powerful germicide and deadly to the bacillus of phthisis. A case is reported in our literature where the tincture cured a case of "cough with purulent expectoration, with pain from front to back in the left chest." I have used myrtol as a remedy in purulent bronchitis with fœtid expectoration with gratifying results in two cases.

Myrtus chekan is a native of Chili. Its virtues reside in an ethereal oil and tannin. The oil is soluble in chloroform, ether, and alcohol. I consider this similar to myrtol, and so far as I have used it its curative sphere is similar. Dr. Dessau, of the German Hospital in Valparaiso, speaks very highly of chekan. His attention was called to it by the cure of one of his patients with chronic purulent bronchitis. He reports many cures of similar cases. Dr. William Murrell, of England, who has made a special study of the remedies for winter cough and bronchorrhœa, reports using it in fifteen cases

of paroxysmal cough with yellow, purulent expectoration, and much shortness of breath on exertion: "There was in all cases within a few days a decided improvement in the cough; expectoration from the first was easier, soon diminished in quantity, and finally the dyspnœa was less."

A great many similar cases are reported cured by chekan in "Pharmacology of Newer Materia Medica." It can be prescribed in the dilutions, or the oil on discs or in soft capsules. The myrtols can be used in a steam or hand atomizer in albolene or fluid vaseline, and when so applied will greatly aid their internal use.

Balsam of Peru is an old remedy noticed in "New Remedies." It has about the same sphere of action as gurjun balsam. In old, fœtid bronchorrhœa it has made many cures. It has been my practice for years to prescribe the muriate of ammonia and other remedies for bronchitis in syrup of balsam of Peru. The syrup is also the best method of prescribing the balsam. It should contain two or five grains to one drachm. The addition of one drop of chloroform to each teaspoonful increases its curative action. There is nothing peculiar about the cough. The expectoration is purulent, profuse, and fœtid as if it came from a vomica or pus secreting surface. Balsam of tolu has similar curative powers but in less degree.

Eucalyptus and eucalyptol have long had a deserved reputation in chronic and fœtid bronchorrhœa. The first notice of this drug in this country referred to its value in fœtid expectoration from any cause. Now it has an established reputation for many chronic bronchial diseases. The tincture was at first used in doses of one drachm or more. The special guiding symptoms of the cough have not been ascertained by provings, but that is not essential. The principal indication is the profuse muco-purulent expectoration, loss of weight and appetite, and night sweats. I know of no medicine which acts as favorably in such grave cases. It can be used in the tincture, on discs, or in syrup (five drops to the ounce), or as the "eucalyptol water," prepared according to my method, one drop to the drachm, with one drop of chloroform. Used as a spray or vapor greatly adds to the effect of its internal use.

Oil of erigeron or oil of senecio is indicated when the expectoration contains bright arterial blood.

Oil of sabal serrulata is gaining a good reputation in bronchor-

rhœa, especially when combined with syrup of the hypophosphite of soda. An excellent preparation of this oil of saw palmetto is with maltine — one drachm to each ounce. In doses of one or two teaspoonfuls or a tablespoonful, I have seen a chronic bronchitis disappear in a few weeks, with rapid increase of the weight of the patient. It has all the fattening power of cod-liver oil, with other valuable properties added. No medicine has a more favorable influence over defective assimilation of foods, or imparts greater vigor to the organs of reproduction. The "saccharated oil" is also an excellent preparation in doses of one drachm.

Silphium is a valuable medicine when the bronchorrhœa is associated with asthma. The expectoration is viscid, tenacious and often offensive, and the chest feels better when the expectoration is profuse.

Turpentine is a remedy almost as old as medicine. It was used by the ancients from prehistoric times. It once had a great reputation in the third stage of pneumonia, when the expectoration was profuse and purulent. Of late years its derivations — terebene, terpene, and terpin hydrate — have taken its place and are extensively used.

All these are typical expectorants. Given in medicinal doses they cause an increased secretion from the bronchial and laryngeal mucous membrane, at first thin, afterwards thick and yellow or green. If massive doses are given the lungs become congested and the secretion is arrested, with dry and painful cough and bloody expectoration. They are homeopathic to all stages of bronchitis. The dose should be varied with the amount of inflammation and expectoration. If the latter is very profuse, muco-purulent, and offensive, give small doses of the crude drug. If there is scanty, bloody sputum, with tightness of the chest and painful cough, the 3x is strong enough.

Terebene is a clear colorless liquid, with an agreeable odor like pine shavings. It is an oil not miscible with water, but can be prescribed on sugar discs, or in chloroform water, and used in albolene as a vapor.

Dr. Murrel gives the following indications for its use: "In cases where there is emphysema, and the ailment has been present for some time, it may be for some years, with the following symptoms:

cough very troublesome, and sometimes even violent; expectoration tough and adhesive, or it may be easy and copious; great shortness of breath and rawness of the chest; sleep broken and general health much disturbed. The beneficial effects of the medicine do not manifest themselves for some little time, and not infrequently the dose has to be increased to ten, or even fifteen drops. If, however, the drug be persevered with faithfully and regularly, the cases are few in which I have to record a failure. Altogether I consider pure terebene one of the most valuable remedies at our command in the above class of cases."

Terpin hydrate is in the form of white greasy crystals, resembling spermacetti. It can be triturated with granular sugar of milk, but is best given in tablets or capsules. It is said to resemble the union of turpentine and creosote. It is tasteless and can be given to children without difficulty.

In the winter of 1890 I made considerable use of it in the bronchial form of grippe in children and adults. The expectoration was profuse and difficult to raise from the bronchi, causing painful wearying cough. I found that the 1x in two-grain doses acted well in young children, lessening the coarse rales and the cough. For adults the pills of one grain each, one every two hours, acted equally well. Dr. Murrell now prefers this to terebene for internal use, and praises it very highly. In an article by Dr. Halsted Boyland ("New York Medical Record," Sept. 24, 1887), hydrate of terpin is highly spoken of. He gives the case of a lady suffering from obstinate bronchitis, and says, "After two doses (of three grains each) there was already an amelioration in my patient's condition; the cough began to loosen; expectoration became free and easy in consequence of elimination by the bronchial mucous membrane; the skin became soft, moist, and natural; and there was a marked diminution in the bronchial whistling and rales." In another case, one of catarrhal congestion of the larger bronchi, treated as in the preceding case, "there was a notable decrease of the mucous rales *ab initio*, and normal vesicular murmur could be distinctly heard in a very few days after." Other cases, such as nasal and pharyngo-laryngeal catarrh from cold, have been treated with equal success. In night cough from habit, two grains of terpin exhibited at bedtime had a good effect.

Oil of sandal-wood has a specific action on the bronchi as well as on the renal passages. In a case of a lady who had chronic bronchorrhœa, with cystic catarrh, and presenting the peculiar "aching in the region of the kidneys" so characteristic of this drug, I gave discs medicated with the oil diluted one-half with alcohol, one every two hours. In a week she came to report that all her catarrhal symptoms had left her, together with the pain in the back.

The drugs possessing no volatile oil probably pass out of the body partly through the bronchial mucous surfaces. Some of them have been found in the sputum.

Muriate of ammonia, crude antimony, tartar emetic, bryonia, coccus cacti, cocinala, euphorbia pilulifera, lippia mexicana, sanguinaria, chelidonium, squills, pulsatilla, hydrastis, sambucus, and iodine all cause an increased secretion from the bronchi.

Muriate of ammonia is considered almost specific for bronchorrhœa by some physicians. It is named a "stimulant" expectorant, and old-school authorities warn against its use when there is much congestion but no expectoration. They know that even small doses of it will sometimes aggravate. Now this is the very reason why it is useful in congestion and inflammation of the bronchi. The 3x trituration, alternated with bryonia, is excellent treatment in the dry stage of bronchitis, especially in children, as well as in adults. It resembles bryonia in many respects in its action on the liver and muscular tissues, and they always act well together. Both have the dry shaking cough, difficult expectoration, and soreness in the intercostal muscles. After the acute stage has passed and the secretion has become profuse, glairy, and tenacious, they should be used stronger, bryonia in the 1x and muriate of ammonia in one to three grains of the crude drug. An excellent prescription is:

℞ Muriate of ammonia . . . . . drm. i.
Fluid extract glycyrrhyza . . . . . oz. ii.
Syrup of tolu . . . . . oz. viii.

A teaspoonful every four hours for adults, and fifteen drops for children.

Arnica may be substituted for bryonia in cases where it is almost impossible to expel the secretions, owing to the soreness and weakness of the muscles of the chest.

Antimony and tartar emetic, while they are depressing in their action on the general system, act similarly to ammonia on the

bronchi. I prefer the iodide to the crude antimony or to tartarized antimony; especially when the bronchitis is an extension from an acute catarrh of the upper air-passages. If the bronchitis originates below, tartar emetic is better. Both are indicated in the congestive dry stage, when there is great oppression of the chest, difficult, short, "grunting" inspiration, with slower expiration, a sensation of internal soreness of the chest, and external tenderness, when "children cry and breathe harder, if you attempt to move them." In this stage the 3x of each is sufficient, but in later stages and in chronic bronchorrhœa, both are useful when the bronchi are loaded with mucus and when coarse rales and bubbling are heard all over the chest, and great relief follows free expectoration; the 2x of either in children, and the 1x in old persons, act magically in causing free expectoration, easy breathing, and a general feeling of comfort.

Coccus Cacti.— The cochineal insect feeds on nearly all species of cactus, and as I asserted in my "Report on the Cacti" to the American Institute, 1890, has in consequence many of the medicinal qualities of cactus. In many cases of bronchorrhœa the heart's action is weak, irregular, and irritable. Coccus admirably meets both conditions. It is *par excellence* the remedy for the cough of drunkards, or those patients that are saturated with the catarrhal poison. There is a remarkable number of bronchial symptoms, of which the following are typical: "Great rawness of the air-passages with enormous collection of mucus, which is albuminous, tenacious, viscid like the white of egg, or in small lumps; cleaning the teeth provokes cough. The effort of hawking to expel the mucus causes vomiting of slime. The respiration is difficult; voice rough and hoarse; speaking causes vocal fatigue; worse at 10 P. M. and 6 A. M.; cough causes violent palpitation, etc." The dose is ten to twenty grains of the 1x of the powdered drug every four or six hours.

Cocillaña.—This is probably the drug mentioned in "New Remedies" as *guarea*. All the species have a specific action on the air-passages. It is a native of Bolivia, where it is used as a cathartic, emetic, and expectorant by the natives. It is a powerful drug; the decoction from "a piece of bark two inches square" is considered the maximum dose, while a decoction from a piece as large as a man's hand has caused death in many instances. It causes "violent sneezing and discharge from the nose. Expectoration from

fauces and throat very profuse, which passed off leaving the throat very dry, bright red, with a line of demarcation very marked at the region of the uvula." Its general action resembles ipecac, but is more intense. Inhalation of the dust causes coughing and asthmatic breathing. Extensive clinical experiments with this drug in bronchitis, acute and chronic, and in diseases of the throat and lungs, have been made by Drs. Stuart and Wilcox in hospitals, and published in "Pharmacology of the Newer Remedies," by George S. Davis, Detroit. They will amply repay a careful study. The drug should be proven by our school. I quote one of the many cases in which it acted promptly as a curative agent:

"Chronic bronchitis, aged thirty-four, physician, had had cough with muco-purulent expectoration for two and one-half months, when he began treatment with cocillaña in April last. Had been in the hands of a brother practitioner, who had prescribed various remedies without benefit resulting. Cough had become so troublesome at night that it prevented himself and others from sleeping. Night sweats and complete anorexia were present. The bronchitis seemed at its worst when cocillaña was begun. Ten minims of the fluid extract were taken three times a day. The cough ameliorated much at the end of the first day, and a comfortable night was passed. During the second day he was caught in a heavy shower and thor oughly drenched, and remained in this condition an hour. As a result, a severe spell of coughing occurred on rising the following day. Cocillaña was continued through that day, and in the evening the cough had quite ceased and the lungs seemed as comfortable as they had ever been. By the sixth day of treatment, cough had entirely disappeared. A noticeable gain in strength was appreciable, no doubt due to improvement in his general condition. Night sweats had ceased, and increase in appetite had been immediate and great. The latter was thought to be the direct effect of cocillaña, as it appeared shortly after taking the first dose and seemed affected by each succeeding one. Cocillaña was discontinued at the end of a week, he feeling well and there being no recurrence of cough. After several weeks of immunity, the cough gradually returned, though not sufficient to cause any degree of annoyance except during one or two days, when a fresh cold was caught. Believes that a regular and persistent use of the drug would have affected a cure."

Euphorbia pilulifera is a native of the West Indies, Mexico, and Australia. It was first noticed as a remedy for asthma. Its active principle is a gum-resin. Dujardin-Beaumetz concludes from his experiments that it acts on the pneumogastric and on the medullary centre rather than on the nerve itself. It is indicated when an attack of bronchitis runs into spasmodic asthma, or in chronic bronchitis, when the dyspnœa is out of proportion to the amount of mucus in the bronchi. I have mentioned this drug under Asthma.

Lippia is a native of Mexico, Cuba, Central America, and Colombia. It contains an etherial oil — lippiol. It has a pungent odor resembling pennyroyal or camphor. The natives of these countries use it as a stimulating expectorant.

Dr. I. J. M. Goss, of Atlanta, Ga., writing of it says : "In the 'Pharmacology of the Newer Remedies' will be found extensive clinical reports of its use in coughs, colds, and chronic bronchitis, all favorable. It is certainly worthy a thorough investigation."

Sanguinaria and chelidonium belong to the same family as the poppy. Both act as irritants of the liver, lungs, and bronchi, and one of their constituents is a yet undiscovered anodyne principle, not morphine. I suspect it is more like hyoscyamine. Their action on the liver, lungs, and bronchi is similar. They cause a bilious diarrhœa, yellow and thin. Now it is well known that during the progress of bronchitis, children often have this bilious diarrhœa, but while the diarrhœa of chelidonium is very bright yellow, and does not relieve the cough, that of sanguinaria, which is also bright yellow, is followed by a relief from the coryza, cough, or bronchitis. Both affect the right bronchi more than the left. The cough of chelidonium is more spasmodic, that of sanguinaria more continuous. Chelidonium causes a larger amount of mucous rales than sanguinaria. Chelidonium has painful stitches in right side; sanguinaria a general rawness inside, and tenderness outside the chest. Both have stitches in the right hypochondrium.

Senega is especially indicated in the bronchorrhœa of old people. The expectoration is composed of thick or watery mucus expelled with difficulty, great sensitiveness of the walls of the chest when sneezing or using the arms, and a tendency to diarrhœa; the stools are thin, watery, colorless, and spurt out with force. It should be more often used in catarrhal bronchitis of children.

Squills causes a bronchitis with profuse, thin, viscid, white, or red (bloody) expectoration. The cough is worrying, day and night, at one time sounding loose, at other times dry; drinking brings on cough. It irritates the urinary organs and causes profuse flow of watery urine with strangury (such as children often have with bronchitis). The bronchitis is attended by great prostration, due to its depressing action on the heart. For this reason it is dangerous in the large doses used in the old-school and domestic practice. It is a heart poison and its indiscriminate use has killed many children. The dose to a child under five years of age should not exceed a drop of the 1x every hour or two. Squills, like all drugs, is especially adapted to children and old people; very old people have a similar bronchitis; they cannot expectorate owing to weakness of the heart and chest muscles; their urinary organs are at the same time irritable.

Pulsatilla affects the bronchial as it does other mucous membranes, causing a profuse thick yellow discharge. In women when a bronchitis sets in after suppression of the menses, or at the change of life, pulsatilla is an excellent remedy.

Sambucus has peculiar symptoms (see "Spasm of the Glottis"). The secretion is very abundant, causing "suffocative catarrh" of the old authors, with heat, attended by profuse sweating and urination.

Sulphur is indispensable in all chronic bronchial affections, especially when there has existed some chronic disease of the skin, and when the patient is extremely sensitive to changes of the weather, draughts, and contact with damp clothing. I know of no medicine so powerful in such cases, unless it is cod-liver oil. If the patient is emaciated I usually alternate the two. Cod-liver oil need not be given in large offensive doses. Soft capsules containing fifteen drops each are now prepared which can be readily swallowed. (When these cannot be taken give morrhuol — one grain, in pill.) Give a dose of sulphur 2x trituration before meals and a capsule of the oil after meals, and continue them for months. They will cure old bronchial winter coughs of years duration, sometimes without change of climate.

"Yerba-santa" (eryodictyon) has attained a deserved popularity in all catarrhal affections of the air-passages. It is a native of Cal-

ifornia, and contains thirty or forty per cent of a gum-resin that is the active principle. We have a short but suggestive proving of the drug on healthy persons from large doses (five to sixty drops of the fluid extract). Primarily it caused a dry, irritating coryza of the anterior and posterior nares, fauces, pharynx, larynx, and bronchi, with feverishness like that of an acute bronchitis. (In such cases the 2x or 6x should be used.) The provers did not take it long enough to get secondary symptoms; I have, however, seen them occur when it was taken to excess. The symptoms indicating its use in chronic bronchitis are: bronchorrhœa, with great amount of muco-purulent expectoration, sometimes offensive, thick, and often streaked with blood. The voice is thick, husky, and is sometimes lost. There is much emaciation, hectic fever, and night sweats; a weak pulse; scanty urine, and œdema of the feet. Auscultation shows bronchial tubes dilated, blowing sounds over the whole chest, moist rales in the smaller bronchial tubes; respiration about twenty-six. The tongue is broad, relaxed, and pale; the appetite poor and digestion slow. I have cured many patients with the above symptoms; and there are hundreds of cures on record in eclectic and old-school journals of apparently hopeless cases. These symptoms being chronic and secondary, the dose should be material in quality. The tincture can be given on discs to young children or sensitive adults, one every two hours, but I prefer giving it in syrup, or with liquorice: one ounce of the fluid extract or tincture to three ounces of syrup of tolu or glycerine, or aromatic fluid extract of liquorice. The dose is one teaspoonful of these mixtures every three to six hours. The patient gets fifteen drops of the drug, which is enough in any case.

The *iodides* are all useful in chronic bronchitis. In the 3x, when the cough is dry and irritating; in large doses when the expectoration is profuse.

Iodide of arsenic 2x when there is great prostration.

Iodide of antimony 2x when tartar emetic is not acting satisfactorily.

Iodide of lithia 2x when the bronchitis has a gouty origin.

Iodide of potassium (one grain every four hours) when humid asthma is present.

Topical treatment may be attended with good results. When

any of the oleo-resins, oils, volatile oils especially, are indicated, they should be inhaled in the form of vapor. If no instrument is at hand, several simple methods can be adopted. (1) They can be dissolved in alcohol, to which a little ether or chloroform may be added, and inhaled from a sponge; (2) mixed with albolene or a similar vehicle, and inhaled from a common hand or steam atomizer; (3) if the medicines are not oily or resinous, or chemical in quality, they can be mixed with water. I have not mentioned hydrastis as an internal remedy because there is no proof that it is taken up and carried to the respiratory organs. I believe it can cause catarrhal inflammation and irritation by its local action only. If used as a spray the fluid hydrastis or fluid hydrastia should be selected.

In muco-purulent or purulent and fœtid bronchorrhœas, there is no remedy that will give such prompt and good results as peroxide of hydrogen; an eight or ten volume solution inhaled deeply will soon cause a change, removing the fœtor and arresting the formation of pus. This can be alternated with eucalyptol water, or eucalyptol in vaseline, which is a powerful agent in arresting purulent discharges.

If there are evidences of the tubercle bacilli in the sputum use myrtol or creosote in the atomizer. Probably the best atomizer is one worked by compressed air.

Diet.—Whatever else the patients eat, they should consume all the oils and fats they can digest, and if their digestion is not complete give plenty of pancreatine two hours after meals

Clothing should be all wool next the skin, all over the body all the year around, and not too heavy; and the skin should be (in lean persons) rubbed with some oil every day in winter. (Cocoa nut, cotton seed oil, vaseline, or olive oil are to be preferred.)

Climate.— Either a cold and dry or a warm and dry climate is to be preferred. There is only one exception. The sea air when it is warm or hot is very beneficial, as along the Atlantic or Gulf coasts of Florida, Cuba, Nassau, or any of the West India Islands where there is no malaria. The high, rocky islands, like Jamaica and Barbadoes, are favorites with English physicians. They are far better than the shores of the Mediterranean, especially the north shores. Tangiers and some places on the south shore are very beneficial. I cannot recommend California, unless the extreme southern

part be excepted, and then only in valleys sheltered from the fogs of the Pacific. In New Mexico and Arizona patients with chronic bronchitis often improve rapidly, and as long as they live there do not have recurrent attacks. I have known many cases of bronchorrhœa get well in an amazingly brief time when living in a climate where the mercury stood at or below zero for weeks. There is some influence in such an air that "freezes out," so to speak, the disease in a few days or weeks.

If fœtid bronchorrhœa is due to a fungus, such a climate would be just the place to send its victims.

Mineral waters.—Those of the greatest value are the sulphurous and the sulpho-saline. Any of these used continuously and moderately doubtless have a beneficial effect over all diseases of the air-passages.

Since I have availed myself of Fothergill's suggestion to give old men with bronchorrhœa strychnine or nux vomica when the muscles aiding respiration and coughing were weak, I have been pleased with the results. After taking one-sixtieth of a grain three times a day for a week they find they have more power to cough and "raise the phlegm." If the heart is weak from dilatation or senile degeneration, give the strychnine and digitalis tablets in the same manner.

Croupous bronchitis is a rare disease. But few cases have been reported. It is always probably an extension of laryngeal croup. In the cases reported tubular casts of the bronchi have been thrown off. The same treatment recommended for the laryngeal form is indicated.

DISEASES OF THE LUNGS.

CONGESTION.

There are two forms of congestion: *active* and *passive.*

Active Congestion of the Lungs.—There is considerable doubt in the minds of some authorities as to the existence of this condition as a separate affection. Nearly all French writers regard it as independent and primary. English authors regard it as symptomatic. American authors generally agree with the English, among them Dr. Osler. There is no doubt that active fluxion, or flow of blood, occurs whenever there is increased action of the heart, or when the

external capillary vessels of the body are inactive or contracted l cold or vaso-motor spasm.

There is an associated congestion of the lungs in pleurisy ar bronchitis.

The symptoms are simply those described under pneumonia in i first stages, namely: the oppression of the chest, cough, dyspnœ chill, followed by fever, and moderate temperature, 101° to 10 The physical signs are defective resonance, feeble breathing, and fi râles. But that there is an intense, rapidly fatal congestion of tl lungs cannot be doubted. I have seen too many cases to allow n to have any doubts on the subject. It follows sudden or continue exposure to intense cold, or an exposure to a cold rain with a cor plete drenching; or getting chilled after being over-heated from vi lent exertion. Such patients often die in twenty-four or forty-eigl hours after being attacked.

In one case where I demanded a post-mortem to sustain my dia nosis, the lungs were found in an intense, almost hemorrhagic, sta of congestion, with no other lesion. The heart and brain we healthy. The patient had ridden thirty miles in a cold rain, ar was drenched to the skin. Doubtless, had his vital energies bee powerful enough to withstand the congestion, pneumonia would hav occurred.

Osler says that in sudden death from disease of the coronar arteries he has seen similar great engorgement of the blood-vesse of the lungs.

Passive Congestion may be divided into two forms: (1) mecha ical, and (2) hypostatic. A mechanical congestion occurs whenev there is an obstacle to the return of blood to the heart. It is cor mon in affections of the right heart.

"On post-mortem the lungs are swollen, russet-brown in colo cutting and tearing with resistance. On cutting into them the show a brownish-red tinge, and the cut surface when exposed to tl air becomes rapidly of a vivid red color from oxidation of the abu dant hemoglobin. So long as compensation is maintained the m chanical congestion of the lungs in heart disease does not produ any symptoms, but with enfeebled heart-action the engorgemer becomes marked, and there is dyspnœa, cough, expectoration, wi the characteristic alveolar cells." (Osler.)

Hypostatic congestion obtains in fevers, and in a dynamic state generally. Then the bases of the lungs are deeply congested, caused partly by the recumbent position and partly by an enfeebled heart. It cannot be an effect of position alone, for a person with a strong heart may remain in bed an indefinite time without its occurrence. On percussion at the bases of the lungs there will be found dullness; auscultation shows feeble, blowing breathing and liquid râles. The subjective symptoms are few.

Treatment.— In severe active congestion from exposure to cold and wet, the first thing is to warm the body and extremities by plunging the feet and hands into hot mustard water, and placing hot bottles around the trunk and on the abdomen. Then give veratrum viride if the heart's action is violent, one to five drops every half-hour until the pulse softens.

Jaborandi has in some cases greatly aided the action of veratrum by flushing the capillaries of the skin and inducing hot perspiration. Aconite and gelsemium are useful, and specially indicated in less dangerous cases when the congestion has been brought on by great excitement, violent exertion, or intense heat. Cactus is a potent remedy, one drop of a good tincture or the 1x often dissipating the congestion in a few hours. Belladonna 3x is also an efficient remedy.

The congestion of the lungs from mitral or aortic stenosis is passive. The blood in the lungs cannot flow into its accustomed channels, the pulmonary vessels become distended, and the right ventricle becomes dilated and hypertrophied. To remove this congestion we must give medicines which will impart sufficient power to the left ventricle to overcome the obstruction until complete compensation obtains. These medicines are cactus, collinsonia, strophanthus, and digitalis, selected according to the indications laid down under Diseases of the Heart.

My experience has been, that in the above condition, cactus is the most useful remedy. It causes short but strong diastolic contractions of the left ventricle, and narrows the main arteries. The dose is one to ten drops of the tincture. In hypostatic congestion the same medicines are indicated, for we have to combat a failing heart, but they should be aided by moderate stimulation and nourishing food. It is in such cases that I advise the alternation of cactus or any cardiac tonic, with small quantities of glonoine. My

reasons will be found in an article on "The Condition of the Heart in Pneumonia."

Congestion of the lungs at the change of life is generally a vaso-motor disturbance. It is rarely serious except in plethoric women or those suffering from aortic or mitral disease. It is generally described as "rush of blood to the chest," or "orgasm of blood in the chest." Sometimes it is described as "palpitation with smothering." The face, neck, and often the whole upper portion of the body are red and flushed. These attacks continue until the final cessation of the menses. I have known them to occur for many years after; several cases in women of sixty years have come under my observation.

Lachesis is a singularly effective remedy in some cases, especially when there is palpitation and a smothering sensation. Sanguinaria is useful when the head feels as full as the chest, and there is some pain in the head; the flushing is worse at the menstrual epoch.

Amyl nitrite is very efficient in mitigating these attacks, especially when the flushing is all over the upper half of the trunk. It is not so efficient when inhaled as when taken internally on discs saturated with the 2x or 3x dilution.

Glonoine 3x or weaker is indicated when there is quite severe pressure and pain with throbbing in the head, with a sensation of constriction or fullness in the chest.

I never have found sulphuric acid or sepia of much value, but I have seen good results follow the use of aurum, silica, and senega.

Pilocarpine 2x will remove those flushings of the chest and face which are immediately followed by profuse perspiration.

ŒDEMA OF THE LUNGS.

In all forms of congestion of the lungs there is a transudation of serum from the engorged capillaries, chiefly into the air-passages from the alveolor walls. It is present in inflammation with new growths, infarcts, and tubercles. When limited to an affected part the name collateral œdema is sometimes applied to it. General œdema occurs under conditions very similar to those met with in congestion. It is no doubt a terminal event occurring in the death agony. It is seen in a typical form in the cachexiæ, in death from

anæmia, in chronic Bright's disease, diseases of the heart, and cerebral affections. (Osler.)

An œdematous lung looks watery, pits on pressure, and from the cut surface a large quantity of bloody serum flows freely.

Experiments seem to indicate that the essential cause of œdema lies in a weakness of the left ventricle, so that the blood accumulates in the lung-capillaries until transudation occurs. This gives us an important hint as to preventive treatment (cactus, strophanthus, and nux vomica).

The symptoms are rapidly increasing dyspnœa and cough during the course of capillary bronchitis or pneumonia. In Bright's disease it comes on very suddenly and may prove rapidly fatal.

Professor Bourret draws attention to a paroxysmal form in Bright's disease. The chief symptoms are parosymal dyspnœa with an abundant albuminous expectoration, ending either in death or speedy relief. He suggests as the cause of this paroxysm a vaso-motor paresis of the pulmonary arterioles. He advises alcohol in large doses, hydrogogue purges, poulticing the thorax, and in urgent cases the subcutaneous injection of caffeine and ether. This form of œdema, and not that in which the left ventricle is failing, is the one wherein apium virus is specifically indicated.

Iodide of potassium in some persons who are very susceptible to its influence has caused dangerous pulmonary as well as laryngeal œdema, and it may prove a homeopathic remedy in patients that are known to be so susceptible; very small doses should be used, not lower than the 2x.

The pulmonary œdema of arsenic is due to its influence on the kidneys, and it may be useful in the paroxysmal form, or it may attend a general œdema like that of chronic arsenical poisoning. It is indicated by the nocturnal attacks, loss of breath in lying down, anxiety, restlessness, and thirst.

Pilocarpine has been recommended, but I fear it would aggravate the condition unless given in very minute doses, because it is so exquisitely indicated by its primary effects. It has caused sudden pulmonary œdema in doses of one-eighth grain, and one drachm of the tincture of jaborandi (of which it is the alkaloid) has caused œdema of an alarming character. It causes a sudden flooding of the bronchioles with thin albuminous or serous fluid which soon drowns

the lungs, owing to the inability of the victim to expectorate it fast enough. A safe and probably curative dose would be the 3x of jaborandi or 6x of pilocarpine.

Ipecac, euphorbia pilulifera, stibium, senega, squills, lachesis, may be indicated. In urgent cases, in men of strong physique, I should not hesitate to use elateriun, croton oil, or saturated solution of Epsom salts, as in pleural effusions.

HEMORRHAGE FROM THE LUNGS.

Pulmonary hemorrhage occurs in two forms: (1) bronchorrhagia, in which the blood is poured out into the bronchi and is expectorated — this is the real hemoptysis; and (2) pneumorrhagia, in which the hemorrhage takes place into the air-cells and lung tissue. This is known also as pulmonary apoplexy. There are several varieties of hemoptysis: (a) in young healthy persons in whom it may occur without warning, like a nose-bleed, and after a day or two disappear and leave no traces. In many cases of spitting of blood, I have found it to be caused by erosions or varicoses at the bifurcation of the bronchi. (b) From pulmonary tuberculosis. It occurs either early in the disease before there are any suspicious physical signs, or after the appearance of decided lesions. The hemorrhage is bronchial, and comes from a limited focus of the disease. When the lesion is more advanced it results from the erosion of an artery. (c) It may come from cancer, gangrene, or abscess. (d) It is met with in many heart affections, especially in mitral lesions. (e) In ulcerative affections of the larynx, trachea, or bronchi. (f) An aneurism may break into the air-passages. (g) It may be vicarious, appearing instead of the menses, in youth or at the change of life. Periodical hemoptysis has occurred after double ovariotomy, ending fatally, when no lesion was found to account for it. (Osler). Finally, hemoptysis may occur as a symptom of gout, in malignant fevers, in purpura, and from foreign bodies inhaled. Hemoptysis generally occurs suddenly. It is sometimes preceded by a salty taste in the mouth, and cough. The amount may be small, only an ounce or two brought up, or the quantity may be great, flooding the bronchi, and pouring from the mouth. One evening a large robust workman, who had never been ill, rushed into my office spitting

large mouthfuls of blood and struggling for breath. Within ten minutes he ejected two quarts of blood and died suddenly; the whole duration of the hemorrhage did not last over an hour. A post-mortem was refused. It is often difficult in profuse hemorrhage to decide whether the blood is from the stomach, or is coughed up, for sometimes the blood from the lungs is swallowed in such quantities as to provoke vomiting. (See differential diagnosis under Hematemesis.) After the hemorrhage has ceased the sputum will be tinged with blood.

The result of this hemorrhage may be gangrene, or a cavity, or it may be absorbed, and a puckered, fibroid patch remain.

Treatment of Hemoptysis.— There has been of late a radical change in the dominant school in their treatment of pulmonary hemorrhage. All astringents are abandoned. Ergot, once considered specific, is rarely used. This change has been brought about by the experiments of Dr. Bradford and Dr. James Andrews of England. They demonstrated that while the pulmonary circulation in man is under vaso-motor control, our knowledge of the mutual relations of pressure in the aorta and in the pulmonary artery under varying conditions is very imperfect. Experiments with drugs on animals seem to show that there may be an influence on systemic blood-pressure, without any on the pulmonary, and the pressure in the one may rise while it falls in the other, or it may rise and fall in both together. Ergot was found to cause a distinct rise in the pulmonary blood-pressure, while aconite produces a definite fall, not only in the pulmonary but in the carotid arteries. Strophanthus caused a rise in the carotid, and a slight fall in the pulmonary arteries. Digitalis caused a great rise of blood-pressure in both. Strychnine produced the same results.

Chloroform caused both pressures to fall. Ether caused both to rise. If these experiments (made on animals) indicate that the same conditions would occur in men, then aconite is the only drug in the above list that should be used in hemoptysis, according to the doctrines of the regular school.

I am not sure that aconite can cause hemoptysis, a real bronchorrhagia. Its primary action in lowering blood-pressure everywhere is certainly to antagonize such an occurrence. I have never been able to find in the provings of aconite that it has caused hem-

orrhage from the lungs. A study of the writings of Richard Hughes and T. F. Allen convinces me that they are of the same belief. If it has caused "cough with scanty expectoration of frothy, bloody sputum," as some of the Austrian provers assert, an examination of their records show they were not healthy men, in fact they had been troubled with the same symptom previous to the provings. The secondary effect of aconite is capillary blood stasis, which may result in passive hyperæmia of the bronchial mucosa, which Osler says may result in hemoptysis. Aconite *is*, however, a potent remedy for pulmonary hemorrhage, but only when it is caused by abnormal vascular excitement. Its primary action is to quiet the beating of an excited heart and lessen the blood-pressure in the arteries. In this way, and in no other, does it arrest pulmonary hemorrhage. The character of the hemorrhage that aconite arrests is characteristic. The blood is florid, and if mixed with mucus is in spots, showing that at each pulsation it spurted from the arterioles. When it comes from an artery, it is in masses that coagulate as soon as it is expectorated. The subjective symptoms are anxiety and fear of death; a sensation of heat and orgasm in the chest, and profuse discharges of blood when not coughing. The dose is immaterial so long as it lies between a drop of the tincture or the 1x or 2x dilution. It should be frequently repeated until the pulse softens, and the heart is quieted.

Veratrum viride is indicated for a higher grade of cardiac excitement, with heavy, full pulse, but the mental demeanor is different from that of aconite. The patient seems calm and indifferent. The blood flow is in large quantity, and fairly spouts from the mouth.

Dr. Goss, in his "Practice," recommends alternating aconite in small doses with ergot in large doses (fifteen to twenty drops) every one or two hours. This is an absurd procedure, as the two drugs are antagonistic. He praises lycopus virginius very highly. He says, "This plant possesses sedative powers by which it controls the capillary circulation, and lessens the calibre of these minute vessels. It is much safer than digitalis. So positive is its action in hemoptysis that I seldom have to use any other remedy to check ordinary cases." I can bear witness to the controlling action of lycopus in hemoptysis, but it is not useful when there is high temperature. If

there is no fever, and the pulse is quick and irritable, especially in tubercular subjects, it is very serviceable. It is also useful when mental excitement or physical exertion is the cause of the hemorrhage. The dose is fifteen to thirty drops of the tincture every half hour.

Cactus stands high in the treatment of pulmonary hemorrhage without fever, when there is great cardiac excitement with violent spasmodic systole. The chest is very much oppressed, with a sensation as if the heart were constricted by an iron band. The blood is arterial and in large quantities; lying down aggravates both cough and hemorrhage. The dose is ten drops of the mother tincture or 1x.

The use of ergot in hemoptysis need not be abandoned by our school. It is homeopathic to active arterial hemorrhage because it primarily raises the blood-pressure in the lungs. Therefore it should in this condition be prescribed in the 2x or 3x dilution of Squibb's fluid extract or "Normal tincture." The dilution should be made with distilled water and used hypodermatically, injecting ten to thirty drops every hour. It is also secondarily homeopathic, for its secondary effect is to cause passive hyperæmia of the pulmonary arteries and veins.

Lilienthal gives the correct indications for it in this condition, viz., "Passive pulmonary hemorrhage, mostly venous, but may be arterial; usually preceded by a sensation of pressure upon the chest, with weak and small pulse. The patient wants to lie with the head low, and wants the window open." Dose, five to ten drops of the preparations above mentioned.

In addition to ergot, the only remedies for venous hemorrhages are hamamelis, carduous, collinsonia, and aloe.

The last three are indicated when the portal circulation is engorged, and the patient has piles, or hepatic disease.

The other remedies for arterial hemoptysis are ferrum, acalypha, ipecac, millefoil, sanguinaria, senecio, erigeron, ruta, and turpentine. The action of sanguinaria, senecio, erigeron, and turpentine is similar to ergot, and can be used in passive as well as active hemorrhage.

Sanguinaria and senecio are useful in vicarious hemoptysis from suppressed or absent menses, and when occurring during tuberculosis.

Arnica is useful, but not always, because of traumatic causes.

It is indicated when the symptoms, the dark, coagulated blood, with stitching in the chest, with a bruised feeling, etc., call for it.

Bryonia is an analogue of arnica with very similar symptoms.

I never found cinchona of any value except in the weakness from loss of blood, but quinine is homeopathic to hemoptysis, and I have known it to excite hemorrhage in many instances when given in large doses. It is specific when the hemorrhage comes on in paroxysms of regular recurrence, malarial or not. The late Dr. H. A. Johnson, of this city, prescribed it (in consultation) for a patient of mine, who had attacks of hemoptysis every night at midnight. Ten grains every six hours arrested it, and on its recurrence several weeks later, had the same effect.

Ustilago and viscum album can be used instead of ergot, as their action is quite similar.

Antipyrin, five to fifteen grains, has arrested profuse hemorrhage from the lungs.

Hydrastis and its alkaloids have lately attained a very high rank as hemostatics. Dr. Schaots was the first to use it in uterine hemorrhages, and to strangle the circulation in uterine fibroids. They have been found superior to ergot, causing no unpleasant symptoms, but improving the general health of the patients. Another German authority says that for several years he has been using no other remedies than hydrastis and hamamelis in hemoptysis, and has found them singularly successful. He does not confine the use of the latter to venous hemorrhages.

I have for several years doubted the propriety of giving hamamelis for venous hemorrhages alone. Can a drug contract the coats of veins without acting similarly on the arteries? In two cases of paroxysmal hemoptysis, I found that hydrastis prevented the attack if given continuously in doses of ten to thirty drops of the tincture three times a day. The white alkaloid, muriate of hydrastine, in doses of one-eighth to one-half of a grain, has been used successfully. Another preparation, the sulphate of hydrastinine, has been found more prompt in its action than hydrastis. It is prescribed in one-eighth to one grain doses three times a day.

There is a form of hemoptysis occurring in old people, which has been found to depend on a hemorrhage in and around emphysematous patches. Dr. Andrew says that all the ordinary medicines fail,

but that if a small dose of mercurius dulcis be given at night, followed by a saline laxative in the morning, it will benefit a majority of cases.

One of the popular remedies in domestic practice for spitting of blood is common salt. A teaspoonful or less is placed on the tongue and allowed to dissolve slowly. It often arrests the hemorrhage, but its manner of action has never been satisfactorily explained. When the ice compress "fad" was the fashion in Germany, it was advised to apply ice bags and the ice-water coil to the chest in hemoptysis. It is a senseless procedure, because it contracts the capillaries of the chest wall, and increases the amount of blood in the lungs. More logical is the suggestion by an eminent German authority, to apply cold air to the bronchial surfaces by inhaling from a tube, air made ice cold by passing through a freezing mixture. He claims that by this method he has in several cases arrested the hemorrhage.

It is sometimes advised that the patient, as soon as he is attacked, shall lie down with the head low, and rest as absolutely quiet as possible. I do not believe the recumbent position with the head low is rational. In this position the heart sends more blood to the lungs, and with greater force. I believe the head and upper part of the body should be nearly upright. I have known the act of lying down to bring back the hemorrhage. I allow my patients to sit in a chair or walk slowly around the room, carefully avoiding any sudden effort.

The diet should be of liquid, unstimulating food, taken cold; milk, buttermilk, ices and ice creams, are sufficient during the attack, and until all traces of blood disappear from the expectoration. It was once taught that the act of coughing was beneficial as it brought up the blood, which otherwise might clot in the bronchi. But coughing certainly increases the flow of blood from bleeding vessels and increases the lesions therein. Never allow patients to cough if it be possible to prevent it. All the effort necessary to get up the blood is a "hemming" effort. Old-school works all advise morphine, and it is better to give it than allow a hard, shaking cough.

Codeine will arrest a cough and the patient will escape the nausea and prostration of morphine. Give one-tenth grain every half-hour until it gives relief.

Syrup or tincture of lactucarium acts well in soothing the cough; sometimes drosera and hyoscyamus act very favorably.

BRONCHO-PNEUMONIA (Capillary Bronchitis.)

Definition.— This disease is essentially an inflammation of the terminal bronchus and the air vesicle which make up a pulmonary lobule. It is also known as lobular, in contradistinction to lobar pneumonia.

The term catarrhal is less applicable. As a rule it is an affection (according to Osler) secondary (1) to the infectious fevers, whooping cough, measles, and less frequently small-pox, erysipelas, and typhoid fever. In children it forms the most serious complication of these diseases, and in reality causes more deaths than are due directly to the fevers. In large cities it ranks next in fatality to infantile diarrhœa. In old people it is an extremely common affection, following debilitating causes of any sort, and supervening in the course of chronic Bright's disease and various acute and chronic maladies.

(2) Whenever the sensitiveness of the larynx is benumbed as in the coma of apoplexy or uremia minute particles of food and drink are allowed to pass the rim of the glottis, and reaching finally the smaller tubes, excite an intense inflammation similar to the vagus pneumonia which follows section of the pneumogastric in the dog.

(3) The most common and fatal form of broncho-pneumonia is that excited by the tubercle bacilli."

In a majority of cases pneumonia of infants under five years of age assumes this form. Rickets and diarrhœa are predisposing causes. It prevails more extensively among the poorer classes because they are more exposed and cannot have the needful care during eruptive fevers.

Broncho-pneumonia may terminate (1) In resolution, which, when it once begins, goes on more rapidly then in fibrous pneumonia. If it attacks the apices of the lungs in a child and persists for three or more weeks it is often tuberculous. When we suppose resolution is delayed, caseation has taken place. (2) In the aspiration-forms suppuration or gangrene often occurs. (3) Fibroid changes sometimes occur; then it is called chronic broncho-pneumonia.

Osler says, "Much confusion has arisen from the description of capillary bronchitis as a separate affection, whereas it is only a part, though a primary and important one, of broncho-pneumonia."

Eustace Smith ("Diseases of Children") takes the same view, but he teaches that it is generally catarrhal in its origin, and not due entirely to the contagious fevers. Osler gives the symptoms as follows: "If during convalescence from measles or whooping cough, a child has an accession of fever, with cough, rapid pulse, and rapid breathing; and if, on auscultation, fine râles are heard at the bases, or widely spread throughout the lungs, even though neither consolidation or blowing breathing can be detected, the diagnosis of broncho-pneumonia may safely be made. I have never seen in a fatal case after diphtheria or measles a capillary bronchitis as the sole lesion."

The dyspnœa is constant and progressive, and soon signs of deficient aëration of blood are noted. The face becomes a little suffused, and the finger-tips bluish. The child has an anxious expression, and gradually enters upon the most distressing stage of asphyxia. At first the urgency of the symptom is marked, but soon the benumbing influence of the carbon di-oxide on the nerve centres is seen and the child no longer makes strenuous efforts to breathe; the cough subsides, and with a gradual increase in lividity and a drowsy restlessness. The right ventricle becomes more and more distended, the bronchial râles become more liquid as the tubes fill with mucus, and death occurs from heart paralysis. The older writers called this "suffocative catarrh."

Eustace Smith gives a graphic description in his article on bronchitis. He says, "When the inflammation penetrates the smaller tubes (capillary bronchitis) the symptoms become alarming. The features look pinched, and the expression is one of extreme distress. The face is pale with much lividity about the nose and mouth. The child is restless. His dyspnœa is great and his respiratory movements are labored as well as hurried, but if the disease is uncomplicated with collapse or lobular pneumonia there is little disturbance of the normal proportion between the pulse and respiration. Often the child is subject to suffocative spasms if laid down, and has to be supported partially upright in the nurse's arms, or raised in his cot by pillows; at each inspiration considerable recession is noticed of the soft parts of the chest, and if the ribs are yielding from rickets, the retraction of the bones of the chest may be extreme. The temperature at first is raised to 101° or 102°, but when aëration of the

blood is greatly interfered with the mercury usually sinks to 99°. The pulse rises to 140 or 150 or higher. The cough is hacking and hoarse, and occurs in stifling paroxysms. The skin is moist and sweat stands in beads on the forehead. Appetite is lost, and the child is thirsty, but on account of dyspnœa he cannot drink or draw fluid from the bottle. Vomiting sometimes follows coughing, when much whitish and yellow phlegm is thrown up. He rarely speaks or cries, as he has no breath to spare." I once attended several notable cases of capillary bronchitis, which did not follow any eruptive fever. They began suddenly without any apparent cause. The dyspnœa was great, efforts to cough constant, but the one peculiarity about them was, that through the nose and mouth there constantly welled up a snowy froth, so light that it floated away on the air. The weather was below zero. No medicine seemed to have the slightest effect, and death occurred on the fifth day. I have never before or since seen or heard of similar cases.

Percussion in capillary bronchitis discovers no dullness. Auscultation reveals fine subcreptitant râles over both lungs. The breathing is nowhere bronchial or blowing, and the resonance of the voice is unaltered if the disease is uncomplicated.

If the case terminates favorably the eyes grow brighter and lividity begins to clear; the cough is looser and less paroxysmal; the pulse slackens, the breathing is less labored, and the child takes more notice.

Osler asserts that "it is a superfluous refinement to make a diagnosis between capillary bronchitis and catarrhal pneumonia, for the two conditions are part and parcel of the same disease." This statement should be borne in mind when consultation takes place. I have known much dissatisfaction among parents and ill feeling between physicians, because of the determination of one to call the disease capillary bronchitis, the other catarrhal pneumonia.

The prognosis is bad in feeble and ill-nourished children and feeble old men, but recovery may take place in apparently very bad cases. Remember the old maxim: "Never despair of a sick child." The death-rate in children is estimated at from thirty to fifty per cent.

Preventive measures may help much to avoid an attack of capillary bronchitis in children after measles and similar diseases. The

temperature of the room should not vary more than two degrees day and night. The child should be kept covered all the time with the same amount of clothing, unless the temperature of the room accidentally falls. If nurses are not watchful children will kick off the bed clothes and lie naked or with exposed limbs, but the use of flannel "combination" suits of underclothing is a great aid to prevent this exposure.

Treatment.— On the appearance of symptoms threatening bronchitis in a young child, particularly after eruptive fevers, the uniform temperature of the room should be kept between 68° and 72°. Some authors, especially English, say between 60° and 65°. This temperature may be appropriate for English and Continental children, but not for the inhabitant of the United States. The truth of this statement I have had frequent occasion to substantiate, for I have seen children improve as soon as the temperature of the room was raised from 60° to 70°.

If the symptoms indicate actual broncho-pneumonia, order a flaxseed poultice (not too thick, for the weight of a poultice often oppresses the patient), in which is stirred oil or glycerine, applied to the chest. After a few days this can give place to a compress of raw cotton. When the poultice is removed the chest should be rubbed with camphorated oil before the cotton is applied. The poultice or cotton jacket should go all around the body—the back should be protected as well as the anterior of the thorax.

The diet should consist of milk, clear broths, and egg albumen. The milk should be well shaken, or mixed with barley-water.

The two remedies during the acute inflammatory stage are aconite or veratrum viride, but neither should be given many hours, and their effects should be closely watched. A high temperature, a small hard pulse, great anxiety and restlessness, with crying and moaning, dyspnœa, hot skin (not always dry), thirst, and suffering on being touched or moved, dry cough, or with scanty glairy sputum, spotted with blood, indicate aconite one-tenth or one-hundredth of a drop every hour. If the temperature is very high, the skin hot, red, and dry, the eyes suffused and bloodshot, the head hot and rolling, a stupor instead of restlessness, a cough with blood-streaked expectoration, a pulse full, hard, bounding, and rapid, then veratrum viride is the remedy. The dose is the same as recommended for aconite.

As soon as the pulse becomes slower and softer, and the tempera ture drops a few degrees, these medicines should be stopped, and bel ladonna, bryonia, or scilla substituted. The indications for bella donna are decided cerebral symptoms, due to the inflammation being seated in the upper portion of the lungs. It is known that when this occurs the symptoms may resemble meningitis more than pneu monia. The rolling of the head, delirium, startings, and convul sions, also the throbbing temporal arteries and dilated pupils, call fo belladonna.

Bryonia may be indicated in some cases of broncho-pneumonia but I rarely use it in that disease. The symptoms "pain on move ment, on being touched, on coughing, and sharp pains in the side," which children old enough will complain of, do not really indicate bryonia, unless we find on auscultation signs of pleuro-pneumonia.

Squills (scilla), rarely mentioned in our text-books, is the rem edy above all others after aconite and belladonna. Pathologically it corresponds in every particular to the symptoms and morbid anat omy of broncho-pneumonia. It causes acute inflammatory capillary bronchitis, which runs the same course, and ends with the same car diac failure as the natural disease. All the symptoms closely cor respond, and I have always been surprised that it was not used in the homeopathic school. Perhaps it is the abuse of it in regular and domestic practice that has led us to avoid it. This has been a great mistake, as we might save, with proper use of it, as many as are destroyed by its abuse. Squills causes a rise of the normal temper ature, hot dry skin, incessant dry or spasmodic cough, which appears to pain the child greatly. Aversion to movement or to be laid down great dyspnœa, and struggling for breath, owing to the clogging up of the bronchioles. The sputum is frothy, glairy, red, and difficult to detach. The pulse is small, hard, and quick. During this first stage, give tincture of squills in the 2x or 1x dilution, five to ten drops in a solution of chloroform, 1 to 1000, every hour or two. If this disease passes into a later stage, when the right side of the heart becomes distended and the heart's force declines, threatening failure, give larger doses, one to three drops of the tincture in glycerine and water, a dose every two hours.

Squills causes nearly all the cardiac symptoms met with in cap illary bronchitis; first, cardiac excitement ending in tetanic contrac

tion in systole. It is this power which makes it so useful in that disease. It is as much the heart failure as any other condition that causes death. If we can sustain the heart, the child has many more chances of recovery. The reason I advise large doses when heart failure impends is that it is a secondary effect of squill, which causes cardiac paralysis in diastole. Given for this indication it acts as a cardiac tonic, and will remove the small, quick, irregular pulse, the cold, livid face and extremities, and suffocative attacks from large accumulation of mucus in the bronchi. It is in this stage that the old school find it so useful when they do not give it in toxic doses. But generally the dose is excessive, and tends still more to engorge the right heart, and to weaken it. Nearly all the authorities caution against its use during the inflammatory stage, and urge that in the second stage its effects shall not be pushed to vomiting, for the vomiting of squill is like the vomiting of digitalis, it means heart failure. If the symptoms of this stage do not give way to squills, and deficient aëration from carbon di-oxide poisoning continues, add to the squill glonoine, to open the arteries and arterial side of the heart so as to allow the venous blood to be passed onward and become aërated. It is infinitely superior to ammonia or alcohol. A child will bear the one-hundredth grain every two hours with benefit. When danger is imminent, try inhalation of oxygen gas, which is said to have saved some desperate cases.

Tartar emetic is homeopathic to all the stages of capillary bronchitis after the acute inflammation, but is not equal to squills, yet many children and old people have been saved by it (and probably as many sacrificed to its abuse). When the secretion is scanty, bloody, and tenacious, with great dyspnœa and oppression on the chest, with short, superficial breathing, give the 3x, a grain every hour; but when at a later stage the bronchi are filling up with the profuse secretion and threaten suffocation, when loud coarse rattling râles are heard at a distance, and the lips and fingers are livid, though the heart seems active and regular, give a grain of the 2x every hour until there is decided improvement.

Sanguinaria and chelidonium are both useful when the right lung is affected and the liver is congested, causing yellow bilious diarrhœa. Their bronchial symptoms resemble those of tartar emetic. Iodine and phosphorus are not fully indicated in uncomplicated broncho-

pneumonia. They act better when there is lobular pneumonia connected with the former.

Grindelia has in some instances been of value in cases where the dyspnœa is asthmatic in character, and the child starts from a momentary sleep, or just as he is falling asleep, with looks of fear and a struggle for breath. There are loud râles, and a weak irregular action of the heart. The dose is two drops of the tincture every hour, in glycerine and water.

Digitalis should not be used, as it contracts the arterioles and increases the distention of the right heart. Cactus is more appropriate as it does not contract the arterioles and capillaries, but increases the force of the heart by its direct action on that muscle and its motor nerves arising from the spinal cord.

If children could define their symptoms in the stage of engorgement of the right heart, I believe they would give the "iron band" symptom of cactus. It acts like squills, without its effect on the capillaries of the bronchi. The dose of cactus to a child need not be smaller than one drop of the tincture, and five is not too much in the stage of impending paralysis. In old people thirty to forty drops may be given safely. If there is much arterial tension it is best to alternate it with glonoine.

PNEUMONIA.

Definition.— Recent researches into the nature of pneumonia seem to prove that it is an infectious disease, characterized by inflammation of the lungs, with constitutional disturbances of varying intensity, and a fever terminating abruptly by a crisis. An organism, the diplococcus-pneumoniæ, is invariably found in the diseased lung.

Etiology.— Pneumonia is one of the most widespread of acute diseases. It attacks all ages, children as well as adults, and it is the special enemy of old age. The dwellers in cities, and persons exposed to cold, hardships, and insufficient food, are most liable to this disease. Contrary to the rule in other infectious diseases, native inhabitants are more liable to it than new-comers. Alcohol renders its votaries very subject to pneumonia. Persons weakened by disease are prone to contract it. An important predisposing cause is a

previous attack. No disease recurs with such frequency; ten or more attacks are not uncommon.

Climate does not appear to have much to do with it. It is rather more prevalent in the Southern than in the Northern states. The influence of season is most important. Statistics everywhere show that more persons are attacked from December to May than in the summer or autumn. The month which shows the slightest variation of temperature has less cases of pneumonia occur in it. It may occur as an epidemic, which fact is considered proof of its infectious nature.

The diplococcus which is supposed to cause this disease generally attacks the lungs, but it has been found in the pleura, meninges of the brain and cord, and in the endocardium. It has been found in the buccal secretions of healthy persons. It is supposed that it only invades the lungs when the system has been lowered in tone. Some interesting studies have been made by Klemerer on the production of immunity and the cure of pneumonia. It was found that animals were rendered immune by subcutaneous injection of filtered bouillon cultures, or a glycerine extract of the micro-organism. This immunity rarely lasted more than six months, but was transmitted to the offspring born within that period. They found that the serum and fluids of the body of an animal rendered immune had the power of not only producing immunity in others, but of actually curing the disease after infection had been in progress for some time. In diseased animals who had a temperature of 40 C. (104° F.), the fever fell to normal within twenty-four hours after the injection.

Pathologists recognize three stages in the inflamed lung: engorgement, red hepatization, and gray hepatization. A full anatomical description of these stages is found in all text-books.

After death the heart is distended with a firm coagulum, which can be withdrawn from the vessels in moulds. The distension of the right chambers of the heart is particularly marked; the left chambers are rarely distended to the same degree.

Pericarditis is not infrequent when the left lung is inflamed. Endocarditis and meningitis are common.

Symptoms.— There is a violent chill in the beginning, more severe than in any other disease except puerperal peritonitis and congestive malaria. The fever rises rapidly, and reaches 104° to 105° F.

The pulse is full and bounding; respiration very rapid; there is pain in the side of an agonizing character (or but little or no pain, as I have observed in several cases), and a short, dry, painful cough, which in a few days is attended by a blood-tinged, tenacious expectoration. After the disease is fully developed the patient lies flat in bed, often on the affected side; the face, especially the cheeks, is deeply flushed, the breathing is very hurried, the alæ dilated with each inspiration, the eyes are bright and the expression anxious.

After persisting from seven to ten days a crisis occurs, and with a fall in temperature the patient passes from a condition of extreme distress to one of comparative comfort. In cases of delayed resolution the fever may persist for some days. The respiration in pneumonia may be very frequent, forty to sixty a minute in adults, and eighty in children.

The dyspnœa is often intense, owing partly to the fever and partly to the loss of function in such a considerable area of the lung, and to the pain. Often the respiration will fall to nearly normal, while the consolidation persists. The inspiration is short and superficial; the expiration associated with a short grunt. This last symptom will often enable us to diagnose pneumonia in children. The ratio between the respirations and the pulse may be one to two, or even one to three. In no other disease do we see such marked disturbance in the ratio.

The cough is at first dry and hard. In drunkards and old persons there may be no cough. An active spitting of blood may usher in the disease.

The expectoration, at first viscid and blood-stained, becomes rusty, more and more as the disease progresses, and is so tenacious that it has to be wiped from the lips of the patient, and the half-filled spit-cup may be inverted without spilling. Towards the close it becomes more liquid and is more easily expelled. In low types of the disease the sputum may be fluid and dark brown like prune juice.

These symptoms are so peculiar to pneumonia that any observing physician can diagnose the disease without a physical examination. Those who desire to consult exact authorities are referred to Dr. H. C. Clapp's work on "Diagnosis of Diseases of the Chest."

The mortality in pneumonia under the ordinary drug or heroic

treatment averages about twenty-five per cent. Under the expectant treatment, which implies the rare use of drugs with good nursing and proper diet, it averages about seventeen per cent. The average mortality under homeopathic treatment is eight per cent. Not only is the death-rate less, but the duration of the disease is modified, and the crisis does not appear so often — the fever declining gradually. The physical signs do not persist as long under homeopathic as under the expectant or the heroic treatment. The complications are less severe, and sequelæ are less frequent.

Notwithstanding these facts, Dr. Osler says: "Pneumonia is a self-limited disease, and runs its course uninfluenced in any way by medicine. It can neither be aborted nor cut short by any known means at our command. Even under the most unfavorable circumstances it will terminate abruptly and naturally without a dose of medicine having been administered." ("Practice of Medicine.") He may be right in asserting that it cannot be aborted or cut short, but that it cannot be influenced in any way by medicine is a false assertion, for he admits that the mortality under expectant treatment is less than under the heroic, *i. e.*, bleeding, calomel, and antipyretics. It is false because he ignores the favorable results accruing under homeopathic treatment. The treatment advised by Osler is anything but expectant, and it is no wonder that his average mortality under it is as high as twenty per cent. He advises Dover's powder, cupping, leeching, blistering, morphine, and even venesection, "in full-blooded healthy men with high fever and bounding pulse." His colleagues not in hospital practice could teach him that a few doses of veratrum viride would be better in such cases than to drain away the vital fluid.

Osler advises against the new antipyretics — quinine, antipyrine, antifebrin, and phenacetine, and implies that they do more harm than good. He says: "Fever alone is not, I think, hurtful, but prolonged pyrexia is undoubtedly dangerous and should be combatted." He and many American physicians are influenced by the baneful practice of Germans like Niemeyer, who advise "ice bags to the affected side," a practice which I believe to be dangerous. If the temperature rises above 104°, sponging with water at a temperature of 80° is all the cold that can be safely applied.

The diet is an important part of the treatment. It should be

light, and made up of articles which will digest easily, and not cause flatulence. If starchy gruels are given, diastase, papoid, or pancreatine should be added. Milk, wine whey, broths, meat juices, and eggs, should constitute the main articles of food. If starch and milk cause flatulence they should be discarded. Gruels made of baked flour rarely cause flatulence, nor does buttermilk as a rule. The use of Vichy or some mild alkaline water as a beverage is both grateful and beneficial.

The chest need not be "bundled up" with poultices or flannels. A compress of raw cotton kept over the chest, and the surface of the chest well oiled with vaseline or any simple unguent, is all the protection necessary.

In country practice, hen's oil, goose oil, and even skunk's and rattlesnake's oil are held in high esteem by the people. There is no objection to their use if they are not spoiled or rancid. It is possible that the oils from the smaller animals are more readily absorbed.

Medicinal Treatment.— At the onset of the disease, when the arterial excitement is great, the pulse hard and bounding, the oppression of the chest and dyspnœa severe, I am sure that I have seen veratrum viride in small doses, one or two drops every half-hour, modify the intensity of the attack. I believe I have seen it abort or cut short an attack, and although it may have been congestion of the lungs with high fever, I cannot relinquish my belief. Perhaps all pneumonias are not caused by the diplococcus; there may be idiopathic cases not due to micro-organisms.

I believe, also, that I have seen typical cases, during the first two days, cut short by the action of aconite. The pain, anxiety, agony of dyspnœa, and distressing respiration have subsided under its use, and a milder type of the disease followed, so mild that had not physical examination showed consolidation, pneumonia would not be believed to be present.

I have no fear of these medicines causing weakness of the heart, if used only during the high temperature; nor have I any fear of phenacetine when used for pain, in doses of two, three, or five grains every two or four hours. In doses of twenty to thirty grains it may cause serious cardiac weakness, but such doses are not to be thought of.

Bryonia, squills, and asclepias tuberosa are indicated by the symptoms noted under pleurisy, and one of them can be alternated with aconite or veratrum. They are useful in any stage so long as their peculiar symptoms are present. Phosphorus and sanguinaria are the special remedies during the stages of red and gray hepatization. If there is any difference in their indications, phosphorus is better when the left lung is affected, sanguinaria when it is the right lung. Chelidonium, the half-brother of sanguinaria, may replace the latter when there is evident hepatic derangement.

There is a so-called "bilious pneumonia" in which the liver becomes implicated by extension of the inflammation or the migrations of the diplococcus to that organ. If jaundice with pale stools and bilious urine occurs, give small doses of euonymin or mercurius. If a yellow bilious diarrhœa sets in instead of jaundice, give chelidonium, carduus, or tartar emetic.

The fever of phosphorus and sanguinaria is remittent and appears about 2 P. M., with circumscribed redness of the cheeks, aggravation of the cough, and dyspnœa. It becomes lighter towards midnight, and in the early morning the patient is quite comfortable.

Phosphorus is also indicated when the disease takes a severe form and the lungs are so extensively consolidated that the right heart becomes engorged. The extremities are cold and dusky, the lips and nose cyanotic, the pulse thready and quick. In this condition it must be given liberally, ten to twenty drops of the tincture in water (kept in a dark bottle), a spoonful every half-hour. For similar symptoms iodide of arsenic or turpentine are sometimes indicated.

Tartar emetic is useful for symptoms not so grave as those of phosphorus, but when the tenacious mucus so fills the bronchi that it impedes respiration, and loud râles can be heard at a distance, then a grain of the 2x repeated every half-hour gives great relief and prevents a recurrence of the same condition.

Iodine is highly recommended by Kafka in all stages of pneumonia, but it appears to me upon insufficient grounds. It is doubtless useful in croupous pneumonia because it is indicated in all croupous processes, but it cannot take the place of aconite, veratrum viride, or bryonia in the first stages; or phosphorus and sanguinaria in the second and third. When an inflammation of the bronchi has extended to the parenchyma, iodine may be useful so long as

the bronchitis lasts. Those physicians who report having treated pneumonia successfully with iodine should remember that the disease will run its course to a favorable termination without medicine. It cannot be considered specific until its use shall reduce the death-rate below six per cent.

Ipecac cannot be considered a true pneumonic medicament, neither can bichromate of potassium, carbonate of potassium, carbo vegetabalis, or hepar sulphur.

Sulphur is useful when the stage of resolution is tardy and delaying. It arouses the torpid energies of the system.

Lycopodium corresponds to a similar condition when the inflammation is inclined to be chronic and of a low type, with hectic, and slow suppuration. The "fan-like motion of the alæ nasi" is no more an indication for its use than for any other medicine, for that symptom is present in all severe cases, and always indicates a limited area of pervious lung tissue.

Quebracho, while not having any relation to the inflammation itself, is a precious remedy for the very distressing dyspnœa. It acts through the pneumo-gastric, and restores its power when it becomes paretic. It improves the respiratory efforts, and indirectly the cardiac paresis. The dose is ten to fifteen drops of the tincture, or the 1x or 2x trituration of its alkaloid aspidospermine in one or two grain doses every two hours.

Grindelia robusta is a medicine I value very highly when with the dyspnœa there are signs of impending heart failure. The symptom—"he fears to go to sleep because he is afraid he will stop breathing"—and the "waking with struggles for breath," all point to paresis of the cardio-motor nerves. In doses of ten or fifteen drops every two hours it gives great relief in this condition, and rivals strychnine, so much used for those symptoms.

Osler says: "Of medicinal agents strychnine is one of the most valuable, and has come into favor as a useful cardiac tonic. It may be given in doses of one-thirtieth to one-twentieth of a grain. I have learned to value it much more than digitalis, which I consider an unsafe medicine in most cases of pneumonia when the right heart is distended." I am aware that the use of digitalis in massive doses, from the beginning, is highly lauded by some writers, but this is not sanctioned by the best authorities. The only cases where I would

vise it is in alcoholics, when a condition like that of delirium emens appears, and the left ventricle is dilated, with a loss of contractile power, or when pneumonia occurs in patients who have ready a weak, dilated heart; cactus or strophanthus are generally fer and more useful. (Consult the chapter on "The Heart in neumonia.")

GANGRENE OF THE LUNG.

This is not a disease of itself, but occurs when necrosed areas ndergo putrefaction. It is a consequence of lobar pneumonia, parcularly in debilitated or diabetic patients. It is prone to follow piration-pneumonia, and puncture of the lungs by weapons or linters, since the foreign particle carried in rapidly undergoes trefactive changes. It may be caused by cancer of the œsophas breaking into the lung. Gangrene may follow embolism of the lmonary artery. It may occur in conditions of debility during nvalescence from protracted fever, without any assignable cause.

The sputum is very characteristic; in the two cases under my re the expectoration was so fœtid that no nurse could be hired to main long with the patients.

Osler gives an accurate description of the sputum. "If expectoted into a conical glass, it separates into three layers: a greenish own heavy sediment; an intervening thin liquid, which sometimes s a greenish or brownish tint; and on top, a thick, frothy layer. pread out on a glass plate the shreddy fragments of lung tissue can rapidly picked out. Microscopically elastic fibres are found in undance with granular matter, pigment grains, fatty crystals, and cteria." Post-mortem, localized gangrene has been found when was not suspected during life, showing that unless free communiion exists between the cavities and the bronchi, no fœtor will be served.

It is difficult to detect the location of the gangrene-area unless it large. Death ensues from hemorrhage, septicæmia, or the patient nks from exhaustion.

Treatment.— This is very unsatisfactory. If the gangrene-area n be located and the patient is not too weak, an attempt should be ade to treat it surgically. Successful cases have been reported. When opened into, the cavity should be treated with iodoform, mer-

curic chloride, or thymol. Deep inhalation of antiseptic substances should be tried; the best are thymol, myrtol, creosote, eucalyptol, and terebene. These same medicines should be given internally in the hope that their volatile principle may be carried by the circulation through the lungs and come in contact with the gangrenous area.

Medicines like arsenic, carbo vegetabalis, ergot, or silica are useless.

EMPHYSEMA.

A practical division of emphysema may be made into compensatory, hypertrophic, and atropic. (Osler.)

It is said to be compensatory when a region of the lung does not expand fully in inspiration, and another portion of the lung expands enough to compensate, or occupy the space. At first the distension of the air vesicles is a simple physiological process, and the alveolar walls are stretched but not atropied. Ultimately, however, they waste, and the contiguous air-cells fuse, producing true emphysema.

Hypertrophic or idiopathic emphysema is a well-marked clinical affection, characterized by enlargement of the lungs, due to distention of the air-cells and atropy of their walls; and clinically by imperfect aëration of the blood, and marked dyspnœa. Osler defines it as "the result of persistently high intra-alveolar tension, acting upon a congenitally weak lung tissue." He discards the mechanical views of its origin, as it would be more common if that alone were the cause. He believes there must first be some nutritive change in the air-cells, and a hereditary tendency, or the mechanical tension would not cause it. It is very common in children. I can imagine that in some children it might be caused by crying spells in which they sometimes inspire very deeply and "hold their breath for a long time." Violent coughing and all straining efforts in which the glottis is closed and the chest walls compressed by muscular efforts, throw great strain upon the apices and anterior margins in which we find the emphysema most advanced. It is caused by bronchitis, or the violent coughing attending it; by whooping cough, asthma, playing on wind instruments, glass-blowing, and violent lifting efforts.

The thorax assumes a peculiar bowl-shaped appearance, and the costal cartilages are calcified. The large bronchi are roughened and thickened from chronic bronchitis, and the smaller tubes are dilated.

nportant morbid changes are found in the heart. "The right hambers are dilated and hypertrophied; the tricuspid orifice is rge, and the valve segments are often thickened at the edges. In dvanced cases the cardiac hypertrophy is general. The pulmonary rtery and its branches may be wide, and show marked atheromatous hanges." (Osler.)

The disease may be well advanced before marked symptoms are eveloped. Children may appear somewhat short of breath on run- ing or climbing stairs, and during extreme exertion become slightly vid. These are the first symptoms. If the cardiac compensation complete there will be no special arrest of the circulation in the ngs except from violent exertion.

In well-developed cases there is always dyspnœa, cyanosis, bron- hitis, cough, and asthmatic breathing. They are much better in ummer than in winter. If the air is warm they are very comfort- ble, if cold and wet they suffer from bronchitis and cough.

The physical sounds on inspection, palpation, and percussion must e familiar to all. If not, consult some work on physical diagnosis. ne characteristic on auscultation is the prolongation of the expira- on; the normal ratio is reversed, four to one instead of one to our. This has often decided my diagnosis. Death may occur from ntercurrent pneumonia, dropsy from cardiac failure, or paralysis of he heart with extreme cyanosis.

Treatment.— The treatment laid down for bronchitis and asthma ay be applied to emphysema. Bronchitis is the great danger to hese patients, and they should live in a warm equable climate. outh Florida is the ideal climate for emphysema. Osler says no emedy is known that has any influence over the disease itself.

Lilienthal gives eighteen medicines, but they are for the symp- oms that arise from the pathological state. We know of no drug hat cures emphysema.

A. K. Crawford writes ("Arndt's Practice") that the remedies nust be chosen "to stop the progress, or restore the damage done o the air-cells"; but he also says "it is impossible to base a ther- py on the pathology." The remedies he recommends are merely palliatives, and this is probably all that can be done by medicine.

Osler says: "When patients come into the hospital in a state of urgent dyspnœa and lividity, with great engorgement of the veins, if

they are young and vigorous they should be bled freely." He says he has saved the lives of several persons by venesection. In the same condition I have found veratrum viride, one to three drops every one-half hour, to have the same effect as bleeding. It acts much quicker when given hypodermatically.

There are two medicines only which give continuous relief in emphysema — coca and quebracho. They seem to possess a power of imparting increased power to the portion of the lung left uninjured. I have found that under the influence of teaspoonful doses of a good tincture of coca they are enabled to walk much faster and go up-stairs with more comfort. Quebracho in doses of ten to fifteen drops of the tincture or one grain of the solid extract, or one-fiftieth of a grain of aspidospermine will often have a better effect than coca.

Atropic emphysema is really a senile change, and nothing can be done except to give the above mentioned remedies, aided by arseniate of strychnine, to stimulate the decaying vital forces. One of the best palliatives in senile emphysema is lobelia. At one time I used it alone, and although I got good results from its use I found some objections to it. In one case I added sufficient to a bottle of wine of coca to give the patient ten drops to each tablespoonful. This seemed to act very favorably, and lately I have generally prescribed lobelia in that manner.

ABSCESS OF THE LUNGS.

Suppuration in the lung occurs under the same conditions as those enumerated under gangrene. The abscesses vary in size from a walnut to an orange. Embolic or infectious abscesses are common in cases of pyæmia. They may occur in great numbers; as a rule they are superficial, beneath the pleura. I have seen several cases presenting abscess in the right lung. They occur in chronic pulmonary tuberculosis.

The expectoration is very offensive, yet it rarely has the horrible fœtor of gangrene or putrid bronchitis. In the pus, fragments of lung tissue can be seen. Embolic cases are generally fatal. Abscesses after pneumonia may recover.

Treatment. — The same treatment recommended for gangrene should be tried. In addition I recommend balsam of Peru in doses

fifteen drops in syrup or chloroform, every four hours. I believe cured two cases with it. Several cases have lately been reported which the cavity has been aspirated, drained, and disinfected. rated calendula would be an excellent injection. I recall two ses in which I believe that the contents of an abscess of the liver ich broke into the lung were expectorated. Both recovered after veral months. Nature's methods of opening and draining abscesses e often curious and surprising, and the results are astonishingly od.

DISEASES OF THE PLEURA.

ACUTE PLEURISY.

Anatomically this disease may be divided into (1) dry or adhe- e pleurisy, and (2) pleurisy with effusion.

(1) *Dry, Fibrinous, or Plastic Pleurisy.*—"In this the pleu- membrane is covered by a sheeting of lymph, of variable thick- ss, which gives it a turbid granular appearance, or the fibrin may ist in thin layers. It occurs (a) as an independent affection fol- ving cold or exposure." This form is not common in perfectly althy persons. The disease sets in with the usual pain in the side d slight fever, and the physical signs of pleurisy are indicated by e friction sound. After lasting a few days the friction sound dis- pears and no exudation occurs. Union may take place between e membranes, or a few adhesions form; or (b) pleurisy may cur as a secondary process in acute diseases, as in pneumonia; can- r, abscess, and gangrene may cause plastic pleurisy. This condi- n is a common one in tuberculosis. Pleural pain, stitch in the e, and a dry cough with marked friction sounds on auscultation, e the initial symptoms in many cases of phthisis, and these sounds ually occur at the bases of the lungs.

(2) *Sero-Fibrinous Pleurisy.*—In the majority of cases, with e fibrin there is a variable amount of fluid exudate. This is known "pleurisy with effusion." Osler and many recent French writers nclude that nearly all pleurisies are in their origin tuberculous. e says, "I confess that the more carefully I have studied the ques- n the larger does the proportion of primary pleurisies appear to of tubercular origin."

Morbid Anatomy.— In sero-fibrous pleurisy the serous exuda is abundant, and the fibrin found on the pleural surfaces, and sc tered through the fluid in the form of flocculi. In some cases the is very little fibrin, in others it forms thick creamy layers. T serous fluid is of a citron color, either clear or slightly turbid, but may have a dark brown color. On boiling it will be found rich albumen. Sometimes it coagulates spontaneously. The amou varies from a half to four litres (one-half to four quarts). In lar effusions the adjacent organs may be displaced. If on the right si the liver is depressed. Osler says, as the result of many post-m tems: "Even in the most excessive left-side exudations, there is rotation of the apex of the heart, which in no case was to the rig of the mid-sternal line, and the relative position of the base and ap is usually maintained."

Symptoms.—These are supposed to be well known, but there many points which make a diagnosis difficult if we judge from sym toms alone. The pain in the side, the most distressing symptom, usually referred to the nipple or axillary region, but this pain m arise from inter-costal pleurisy, rheumatism, or myalgia. Dr. Inm has shown in his work on myalgia that a severe pleurisy may r its course without the pain in the side, supposed to be characteris of pleurisy. Again, as Osler observes, pleuritic pain may be felt the abdomen or low down in the back when the diaphragmatic s face of the pleura is involved. The pain, wherever it is, is sha stitching, or lancinating, aggravated by movement or coughing a inspiration. The same may occur in inter-costal neuralgia or my gia. The only trustworthy diagnostic sign is the rubbing sound auscultation, and this can be detected at an early stage.

The fever rarely rises so rapidly as in pneumonia, and does r reach the same grade. The average temperature is 102° to 10 It may drop to normal in a week or ten days, or may persist s eral weeks. Cough is an early symptom, but is not as severe as pneumonia. It is sometimes entirely absent. The expectoration slight, mucoid, and only occasionally streaked with blood. There some dyspnœa at first, partly due to fever, and partly to pain. La it arises from compression of the lung. But when the fluid is effus slowly, one lung may be entirely compressed without inducing sho ness of breath, except on exertion. If the effusion is great, t

atient usually prefers to lie on the affected side. I omit the physal diagnosis, referring the reader to those works which treat of it xhaustively.

The severe pain on coughing and breathing can be alleviated by xing the muscles of the thorax by a firm, smoothly applied bandage careful strapping with long strips of adhesive plaster, which ould pass well over the middle line, drawn tightly and evenly. If ne side only is affected the strapping can be confined to that side.

Treatment.— A correct diagnosis is very important. The proper lection of the remedy depends upon it. We have but few remdies homeopathic to pleural inflammation with effusion; while we ave many that are indicated in rheumatic or myalgic pleurodynia, inter-costal neuralgia.

Aconite is always useful in the first stage, and should be given long as the pulse is small, hard, and quick, and the temperature ver 102°. Mild cases of pleurisy will run a brief course under the fluence of aconite.

Veratrum viride or gelsemium are rarely indicated, and are more seful in pleuro-pneumonia, with a high temperature and great arteal excitement.

Bryonia is the chief remedy in all stages of pleurisy when it uns its regular course. It is the one serous membrane medicament rom the vegetable kingdom of the qualities of which we have much rustworthy clinical knowledge. We believe it has caused pleurisy ecause its pathogenesis has all the essential symptoms, and because here are pathological facts which show that the conclusions drawn rom the symptoms are correct. The autopsies of the animals poisned by the Vienna provers showed that the pleuræ were injected nd full of serum, and other serous membranes injected. It has een said that before the time of Hahnemann bryonia was only used s an emetic and cathartic. This is an error, and Hahnemann oubtless had a knowledge of its value in chest affections which rompted him to prove it.

In Mangeti's "Materia Medica," published in 1753, written in atin, it is recommended for "purging serous and pituitous humors rom the chest"; "senile asthma"; "dropsy, internal and external"; sciatica" (dolorum ischiadicum), etc. Culpepper in his "English lerbal" (1800) says: "It mightily cleanseth the chest of rotten

phlegm, and wonderfully helpith an old strong cough, and those that are troubled with shortness of breath." He gives it the qualities we give arnica. "It is very good for them that are bruised inwardly, to help to expel the clotted and congealed blood."

Hahnemann used at first the tincture (one-half alcohol, one-half expressed juice), one drop at each dose; later he recommended the 18th dilution, and finally, when the high-potency idea took possession of him, directs only one drop of the 30th to be given, and not repeated for weeks. To-day bryonia is used in pleurisy not only by our school but by eclectics and others. Their experience in its use shows that Hahnemann was laboring under a mistaken belief when he declared it dangerous to use repeated doses of the 18th or 30th in pleurisy, for it is now used by thousands of physicians in doses quite material without causing aggravations. Eclectic and old-school writers recommend one drachm to four ounces of water, a teaspoonful every half-hour in acute pleurisy.

Dr. Goss ("Practice") recommends two or three drops every two hours, and I have known as much as five drops of the tincture to be given every two hours without any other result than decided amelioration of the pain and cough. I never have observed any beneficial results from bryonia when used higher than the 6th. I usually use the 2x in pleurisy.

Asclepias tuberosa got its common name "pleurisy root" from its use by the country people in this disease. It was considered the principal remedy by the "Botanic physicians" in the early part of this century. The eclectics made it a prominent member of their Materia Medica, and it is to-day with them a standard medicine in pleurisy. Since they have appropriated our bryonia, however, it has taken a second place. We have but two provings. One by Dr. Savery, of Paris, who took two drops of the tincture and did not repeat the dose, but recorded all the symptoms (many of them natural sensations) experienced for six weeks. This proving is valueless. The other proving was made by the late Dr. Tom Nickol, who took from ten drops of the 1x to sixty drops of the tincture, until notable symptoms were developed, some of them giving a good picture of a mild left pleurisy. It seems to be a lesser bryonia and is probably not adapted to severe cases. The fever is not as high and the effusion is probably serous. The symptoms are: "Acute

uritic pain in right side with dry hacking cough and scanty
ous expectoration, better by bending forward and worse by
tion," also "stitches to the right side, and up to the left shoulder;
ere pain in the muscles and joints, hot sweating skin with ameli-
tion of the pain."

Cantharis has lately been praised by Jousset as a remedy for
urisy in the stage of effusion; he extols it above all other drugs.
special symptoms are said to be "a profuse serous exudation,
pnœa, cough, palpitation of the heart, a tendency to syncope with
vy sweats and scanty urine." In the provings the subjective
mptoms of pleurisy are scanty. But we know that in cases of
soning in men, congestion of the brain and serous effusion on the
face is found, and that the peritoneum is inflamed. There is no
ord of its action on the pleura, but we may safely assume that it
l cause inflammation there. The decided and undisputed benefit
ich accrues from blisters of cantharides in pleurisy, above all other
ds of blistering agents, would seem to show that it has some spe-
c action aside from the good effects of counter-irritation. Can-
ris benefits the effusion by its specific action when absorbed
o the circulation. I am sure that I have seen prompt alleviation
m pain on the application to the affected side of a few small
sters of the size of a dollar, when other medicines had not caused
isfactory improvement.

Squill is undoubtedly a valuable remedy in pleurisy. It resem-
s cantharis as well as bryonia, having many symptoms in common
h both. It is rarely mentioned among the remedies for pleurisy,
l when it is mentioned the indications are poorly given. I have
re confidence in it than I have in cantharis, especially in children
ose pleurisies are rapid and dangerous. I consider it useful when
pleuritic affection is attended with capillary bronchitis caused by
posure to cold or dampness after eruptive fevers. The effusion is
ous and forms rapidly, while the kidneys are very torpid and the
rt rapidly failing in force. The following are the symptoms
nd in its pathogenesis and marked as characteristic: "Frequent
tation to a short dry cough, in four or five shocks, caused by tick-
g beneath the thyroid cartilage." "A violent sudden cough in the
rning, with stitches in the side on every cough, with expectora-
n." "Cough in the morning, with profuse slimy expectoration."

"Cough, at first accompanied by expectoration." "Constant expectoration of mucus." "Difficult or embarrassed respiration." "Frequently obliged to take a deep breath, which provokes cough." "Dyspnœa and stitches in the chest, which are most distressing on inspiration." "Oppression across the chest as if it were too tight, drawing pain in the chest. Sharp stitches in the scapular end of the clavicle during inspiration and expiration. Severe stitches near the sternum, extending downward so that he could with great difficulty get his breath. Compressive pain in the right side of the chest, ending in a stitch. Broad pressive stitches beneath the last ribs of both sides, lasting two days. On inspiration, jerking stitches in the right and left sides of the chest not far from the sternum. Stitches in the left and right true ribs at the same time, drawing stitches from the right true rib to the shoulder. Broad, blunt stitches in the last ribs of the left side, in the morning in bed, that wake him. A contracting stitch in the left side, just beneath the last ribs. Stitches in the left side."

Senega is a close analogue of squill. A study of its pathogenesis will show many symptoms which could hardly be caused by intercostal pain alone, although many bear a close resemblance to rheumatism of the chest. No obstinate case of pleurisy should be treated without referring to senega. Old-school authors mention squills and senega in pleuritic effusion, and imagine that they act only as diuretics, ignoring their homeopathic relation to the disease.

Carbonate of potassium, so much vaunted in stitching pains, is supposed by some to affect the pleura, but I think all the stitches are in the muscles of the chest. It is a muscular tissue remedy, not a serous tissue remedy. The stitching pains in the side attending lung lesions are rarely in the pleura, but are sympathetic, and in the inter-costal nerves. If pleuritic pains occur as an extension of lung lesions the pleurisy certainly would not yield to carbonate of potassium. That it will palliate "stitches" in the side during chronic pulmonary troubles may be true, but the transitory nature of the "stitches" makes it a doubtful remedy in chronic pleurisy.

Rhus toxicodendron has no place in the therapeutics of pleurisy unless rheumatism is a complication.

The belief that the serous effusion in pleurisy can be dissipated by diuretics is fallacious. It can be dissipated by active depletion

blood serum as described by Matthew Hay, as I have tried with
ccess in many cases, not only of this disease but of peritonitis and
ricarditis with effusion. The theory is that if the serum is
stracted from the blood, or if it is kept concentrated, the liquid
ll be absorbed from the lymph spaces, of which the pleura is one,
equalize the loss. To do this the liquid food of the patient should
greatly restricted. If there is no fever, a diet of meat with eggs
d dry bread, and only eight ounces of milk or water, should be
ven. Then give the patient, if he is moderately robust, one or one
d a half ounces of Epsom salts an hour before breakfast, in con-
ntrated solution. This produces copious liquid discharges and a
pid disappearance of the exudation. I have been surprised to
serve how little it weakened the patient. In young persons, not
oust, I give a tablespoonful of the concentrated solution every
ır or six hours, and find it amply sufficient. I have rapidly "run
" general dropsy from heart disease by this method, after digi-
is, apocynum, and diuretin failed. The former practice of giving
lides to stimulate the absorbents to take up the effusion has been
doubtful utility.

Pilocarpine and other perspiration-producing drugs, as well as
e diuretics, have not been more successful. They may be useful
xiliaries, but nothing more.

Aspiration of the fluid is the most thorough and satisfactory
thod, but it should be resorted to only when it is found that other
ans have failed.

The following are the indications that call imperatively for the
eration: (1) In all cases where there is complete filling up of one
le of the chest. (2) In any case when even moderate effusion
s lasted several weeks. (3) When the fluid reaches the clavicle
e operation is imperative, even though the patient is comfortable
d presents no sign of pulmonary distress. The presence of fever
no contra-indication, for often where the serous exudate is drawn
the fever abates. Aspiration may prevent death from a sudden
ack of dyspnœa, or subsequent phthisis, or the wearing-out of the
al forces. It will prevent those tedious cases which end in spon-
neous evacuation of the fluid, or blood-poisoning from purulent
tters gaining access to the circulation.

Empyema is really a surgical affection, and should be treated as

such. When an exploratory puncture has shown that the fluid is purulent, it should be withdrawn, not by aspiration but by a free incision, and free drainage obtained. Irrigation is rarely necessary unless the contents are fœtid. The practice of some surgeons of irrigating with carbolized oil is useless and dangerous. In two cases in which this method was practiced upon my patients by the surgeon, who was selected by the patient, both died, more from the effects of the drug than from the operation itself. If any disinfectant is used, some of the non-poisonous ones should be selected. Borated calendula or peroxide of hydrogen are both safe and efficient.

The subsequent treatment is a point of great importance in facilitating the closure of the cavity and in the distension of the lung on the affected side. The following method has been practiced with great success in the Johns Hopkins Hospital: The patient daily for a certain length of time, increasing gradually with the increase of his strength, transfers by air pressure, water from one bottle to another. The bottles should be large, holding at least a gallon each, and by the arrangement of tubes, as in Wolff's bottle, an expiratory effort of the patient forces the water from one bottle into the other. In this way expansion of the compressed lung is systematically practiced. During this process the respiratory power can be greatly aided by the administration of tincture of erythroxylon coca and quebracho, one drachm of the former with fifteen drops of the latter, mixed or alternated every four hours. During convalescence the diet must be of the most sustaining nature, and as liberal as the digestive organs can manage. Those medicines, like strychnine and hydrastis, which aid digestion, together with pepsin and pancreatin, should be prescribed in material doses. Cod-liver oil, with beef emulsions, and the hypophosphites, are often indispensible, especially if there is hectic fever.

CHAPTER VI.

DISEASES OF THE DIGESTIVE SYSTEM.

DISEASES OF THE MOUTH.

STOMATITIS.

SIMPLE STOMATITIS is one of the commonest forms of inflammation of the mouth. Frequent in all ages, it is more often met with in children, associated with teething, or derangements of the stomach. It may be limited to the gums and lips, or may extend to the surface of the cheeks and tongue. It is an erythematous affection. There is at first redness and dryness of the mucosa, followed by an increased secretion with furred tongue, which is swollen and indented by the teeth.

Treatment.— Adults should avoid all irritating, spiced articles of diet, as well as tobacco and spirits. Infants should be fed on bland fluids. A wash of weak borax, or boric acid, should be used; and in severe cases a very weak wash of fluid hydrastis.

Apthous Stomatitis (follicular stomatitis) is characterized by the appearance of small, slightly raised spots surrounded by red areolæ. The spots appear first as vesicles which rupture, leaving small ulcers with grayish bases and bright red margins. They appear generally on the inner surfaces of the lips, the edges of the tongue, and the inside of the cheeks. This form is met with in children under three years of age, but is also often seen in adults; they are popularly known as "canker spots," and are generally caused by derangements of the stomach, or appear during gastric fevers. It must not be confounded with "thrush."

Treatment.— I have had the best results follow the touching each one with a one per cent solution of nitrate of silver, and in severe cases with dilute nitric acid. A wash of chlorate of potassium or phytolacca, ten per cent, aids in their removal.

Ulcerative Stomatitis, popularly known as "putrid sore mouth," often occurs in children after the first dentition. It sometimes prevails as an epidemic in unsanitary hospitals, camps, and jails. Unwholesome food, damp dwellings, unclean mouths, decayed teeth, and other causes lead to it. The morbid process begins at the margin of the gums, which become red, swollen, and bleed easily. Ulcers form with a grayish-white base and firmly adherent membrane. In severe cases the teeth are loosened, and necrosis of the alveolar process may occur. Tongue, lips, and cheeks may be swollen and sometimes ulcerated. There is salivation, the breath is fœtid, mastication is painful, and the sub-maxillary glands are swollen. It cannot readily be distinguished from the effects of mercury, and is often caused by the prolonged use of that drug.

Treatment.— If not caused by mercury, the best remedy is mercurius corrosivus, 6x, a dose three times daily, and a wash of chlorate of potassium, one drachm to a pint of water. If caused by mercury give hepar sulphur, and use the same wash of the chlorate, ordering that a tablespoonful of the solution be swallowed every four hours. If the breath is very offensive, give a wash of peroxide of hydrogen, five volumes.

Stomatitis Materna, or the sore mouth of nursing women, is an obstinate and distressing affection. It may take the form of a diffuse erythema, or a follicular inflammation, and is caused either by debility from lactation, or by unwholesome surroundings. Very little has been written about it, neither Guernsey, Leavitt, Richardson, Lusk, or any other author I have consulted, mentioning it. I have seen many cases, some of them of a very serious character, which undermine the health so greatly that weaning the child becomes imperative. In the worst cases the gums and whole buccal cavity were red, dry, and ulcerated. The tongue was denuded of epithelium, and was glazed and stiff; even the pharynx became invaded. Sometimes I have been able to arrest it by nitric acid, cinchona, tincture of the chloride of iron, or hydrastis; with a wash of dilute nitric acid or nitrate of silver; but generally a cure was impossible until lactation was suspended. Then the result was surprising; the mouth getting well in a few days, and the patient's strength returning rapidly.

Parasitic Stomatitis (thrush, muguet).—This disease is depend-

ent on a fungus — the oidium albicans — a species of yeast fungus, and consists of branching filaments from the ends of which ovoid torula cells develop. It does not attach itself to normal mucous surfaces, but is caused by improper food, uncleanliness of the mouth, and unclean bottles, spoons, etc. It is not confined to children, but attacks adults in the final stage of fever, in chronic tuberculosis, diabetes, and cachectic states. The parasite develops in the upper layers of the mucosa, and filaments penetrate the epithelial cells. The disease may begin on the cheeks, tongue, or lips, in the form of slightly raised white spots, which increase and finally coalesce. When scraped off it leaves the mucosa intact, or if severe, a red, bleeding surface, which may ulcerate. It may extend downward through the whole digestive tract and even into the air-passages. It is sometimes transmitted to the mother's nipples, and to her mouth from kissing the child's lips, and to other children who use the same spoon.

Robust infants sometimes have a touch of it, but it generally affects delicate feeble children artificially fed.

Treatment.— It is more easily prevented than cured. All the utensils used by the child should be put to soak in a strong solution of borax, boric acid, or sulphite of soda, or washed in boiling water.

Washes of borax, sulphite of soda, peroxide of hydrogen, or permanganate of potassium, not too strong, should be used after nursing or feeding. The health of the child should be improved by the use of phosphate of calcium, cinchona, or muriate of iron. It may be necessary to order a wet nurse if the child has been artificially fed; or to order the patient's removal to the country or sea coast. There is a form of muguet which is generally seen in old people. The fungus penetrates deeply into the tissues, and seems to affect small areas on the tongue. These spots swell and protrude, and look like fungous granulations, bleeding easily. The tongue is swollen, pale, and flabby, and assumes a bluish appearance. Muriatic acid strong enough to taste sour, used as a wash and swallowed, is specific.

Gangrenous Stomatitis (cancrum oris).— This terrible disease is seen only in children who live in very unsanitary conditions, or in those convalescent from measles, scarlet fever, and typhoid fever. It is a rapidly progressing gangrene, starting on the gums or cheeks,

and leads to extensive sloughing and destruction. In some cases the cheeks are perforated. It may spread to the tongue and chin, and invade the bones of the jaws, eyelids, and ears. The pulse is rapid and weak, the prostration extreme, the odor horribly offensive. A diarrhœa may supervene. Death may occur within a week or ten days. It is supposed to be caused by a bacillus. It may appear so insidiously that extensive sloughing is present before it is noticed.

Treatment.— Unless seen in the early stage it is difficult to prevent dangerous consequences. Several cases have been reported cured by the continuous application of subnitrate of bismuth. The gallate of bismuth, perhaps, would be equally useful. Destruction of the sore by fuming nitric acid or Paquelin's cautery has arrested the disease. In mild cases boric acid applied in powder may be useful. A wash of thymo-hydrastis, baptisia, or peroxide of hydrogen (ten volumes), should be used. Internally, arsenic 3x, cinchona mother tincture, or cyanide of mercury 6x should be given. The food should be strong and liquid. Valentine's meat juice, beef tea acidulated with muriatic acid, or yelk of eggs beaten up with brandy must be given frequently.

DISEASES OF THE SALIVARY GLANDS.

Hypersecretion (ptyalism) may arise from the use of mercurials, for which belladonna, hepar sulphur, aurum, and phytolacca are useful; aided by a strong wash of chlorate of potassium, with ten grains internally several times a day. If it occurs in mental and nervous affections, pilocarpine 6x will probably arrest it. With this remedy I have cured several severe cases occurring during pregnancy and accompanied by distressing nausea. It sometimes occurs during the menstrual period, and from sexual erethism. If idiopathic, some mercurial preparation is usually specific.

Xerostomia (dry mouth) is a condition in which the secretions of the mouth are suppressed. The tongue is red, cracked, and dry, the mucous membrane of the cheeks and palate is smooth, red, shining, and dry; swallowing and articulation are difficult. In some cases the general health is unimpaired. It may be due to impairment of some centre in the medulla which controls the secretion of the glands. I have seen it occur from intense and sudden grief.

When of a purely nervous origin, pilocarpine 2x will cure nearly every case. Occasionally belladonna or lachesis will cure. It is common in septic fevers, and is then ominous, although in several instances I have restored the secretions permanently with pilocarpine. Baptisia is excellent in mild cases. Osler reports a case cured by the galvanic current.

Parotiditis (mumps) has been treated of under Infectious Diseases.

DISEASES OF THE TONSILS.

Acute Tonsilitis. — The various forms which have been called catarrhal, erythematous, ulcero-membraneous, and hepatic, may for all practical purposes be considered together. It is commonly caused by exposure to cold and wet, aided by bad hygienic surroundings. In cities a large proportion of cases is caused by defective drainage. When several persons in the same building are attacked I always order the sewer pipes to be examined, and nine cases out of ten some defect is found. I believe that certain ptomaines generated in the intestinal canal will cause tonsilitis. It sometimes appears to have some connection with rheumatism, and with disorders of the sexual system, but this connection is not yet fully proven. The symptoms are soreness of the throat, pain on swallowing, and fever which often reaches 105°. On examination the tonsils are found swollen, and there is a creamy exudation from the crypts. The tongue is furred, the breath is heavy and foul, the urine is high-colored and loaded with urates. Swelling of the cervical glands is usually present. In severe cases the exudation forms cheesy-looking products, appearing like the heads of shoe pegs, the exudations sometimes coalescing. This is the form so often supposed by ignorant or careless physicians to be diphtheria, and when reported to medical societies forms the majority of those "hundreds of cases cured by various medicines."

When the exudation covers the tonsils it may be difficult to distinguish it from true diphtheria, but the yellowish-gray masses in tonsilitis differs from the pearly or ashy-gray membrane of diphtheria. In tonsilitis the patches never creep up the pillows of the fauces or appear on the uvula. The diphtheritic membrane when removed leaves a bleeding, eroded surface, but the exudation in tonsilitis is easily separated, leaving no erosion. There is no doubt,

however, that this condition of the tonsils affords a fertile field for the growth of the bacillus of Loeffler. Jacobi lays much stress on this fact, and I have seen several cases that were undoubtedly follicular tonsilitis, and had nearly run their normal course when the true diphtheritic membrane suddenly appeared. This complication should be carefully watched for, and prevented by the use of washes of thymol-hydrastis and peroxide of hydrogen.

In *Suppurative Tonsilitis* (quinsy) the inflammation is deeper-seated and involves the stroma. The constitutional disturbance is greater, and high fever with nocturnal delirium is not uncommon. The tonsils rapidly enlarge and reach such a size that they meet in the middle of the throat, or when only one is affected, it may push the uvula aside and touch the other tonsil. They are firm, dusky-red, œdematous, and very sensitive to the touch. There is a profuse flow of saliva, glairy and tenacious. The lower jaw is fixed, and the mouth can with great difficulty be opened. In from three to six days the enlarged gland becomes softer, and sometimes fluctuation can be felt by placing one finger on the tonsil and the other at the angle of the jaw. The abscess usually points into the mouth, or toward the pharynx. It may burst spontaneously, affording instant relief, but cases are on record where it has burst into the larynx, causing death by suffocation.

Treatment. — For follicular tonsilitis, if seen during the stage of high fever at the onset, aconite is specific; but it will not arrest or modify the inflammation unless it is given in the 1x, a drop every hour in children, and ten drops for an adult. After the first few hours alternate it with proto-iodide of mercury 2x. Phytolacca rivals the latter in some cases, especially when the spots coalesce, and seem pseudo-membraneous; it is for this appearance that phytolacca has won a reputation in diphtheria, for I do not consider it a true diphtheritic remedy. These remedies alone will conduct nearly all cases to a favorable termination. A spray of trypsin or papoid will dissolve the exudation when it is excessive.

In *Parenchymous Tonsilitis* other medicines are more appropriate, in addition to aconite. It is claimed that rubbing into the tonsils bicarbonate of soda will abort quinsy, but I have not found it so; although I have seen amelioration follow the rubbing in of the salicylate and bisulphite of soda, and alternating either of them with aco-

nite, in doses of three grains every two hours. If great pain in the tonsils and contiguous tissues is present, phenacetin, two grains every hour, gives decided relief, much better than morphine. If there seems to be some connection between this disease and rheumatism, and if the urine is loaded with uric acid or urates, give benzoic acid 1x or the benzoate of lithia 1x. I have seen good results follow the use of three grains of salol; or guiacum, five drops in a teaspoonful of milk or maltine, given every two hours.

Dr. R. Hughes and others believe that the carbonate or muriate of barium will prevent suppuration, but I have not been fortunate with it, although I have used it in the 8x, 6x, and 12x. In my earlier practice I believed I aborted cases of suppurative quinsy with lachesis, but it has lately disappointed me. Several years since, I was told by several patients that if as soon as they noticed the first symptoms of quinsy they took five grains of calomel or three grains of blue mass (following either in six hours with a seidlitz powder, if in that time no purgative action appeared) the quinsy would surely be aborted. I requested them to try it, and the result surprised me. Since then I have tested the practice many times, with the result that in one-half the cases the inflammation was apparently arrested. At any rate it always ran a mild course, and was not attended by suppuration. If suppuration seems inevitable, give hepar sulphur 2x, a tablet, or two grains of the trituration, every hour, to hasten that process. Old-school authorities use the 1x of calcium sulphide with very gratifying results. A gargle of thymol-hydrastis or peroxide of hydrogen should be used, after the abscess is open, and until it ceases to discharge. If possible, open the abscess, but I confess I have rarely been successful in the attempt to do so. There is some danger of cutting the internal carotid artery. This perhaps has prevented me from cutting deep enough.

Chronic Tonsilitis. — This may be defined as an enlargement and induration of the tonsils, with chronic naso-pharyngeal obstruction and mouth-breathing. Osler considers under this head, hypertrophy also of the adenoid tissue in the vault of the pharynx, sometimes known as the pharyngeal tonsil, "because both these tissues are involved and are not to be differentiated."

This affection is now considered of great importance, as it may influence in an extraordinary way the mental and bodily develop-

ment of children. The tonsils may be in a condition of hypertrophy, due to a multiplication of all their constituents; or, in some instances the fibrous matrix is increased, and then the organ is harder, smaller, firmer, and cut with great difficulty. The adenoid growths which spring from the vault of the pharynx form masses varying in size from a small pea to an almond. They may be sessile, with broad bases, or pedunculated. They are reddish in color, and contain numerous blood-vessels. They are more frequently nipple-like, with a lymphoid parenchyma; chronic nasal catarrh usually coëxists. The direct effect of these hypertrophies is the establishment of mouth-breathing, a deformity of the thorax known as "chicken-breast," a changed facial expression, and a kind of mental hebetude. The mouth-breathing is not so noticeable during the day, but at night the child's sleep is greatly disturbed; the respirations are loud and snorting, and there are sometimes prolonged noisy inspirations. The child may wake up with symptoms like spasm of the glottis. The expression of the face is dull, heavy, and apathetic, partly due to the fact that the mouth is left open. The child is stupid-looking, responds slowly to questions, and may be sullen and cross. In school they are considered "dunces." The lips are thick, the nasal orifices small and pinched, the roof of the mouth is arched and higher than normal. This condition is said to cause stuttering. The hearing and sense of taste and smell are dulled. Incontinence of urine may exist as a part of the abnormal state. Headache is an almost constant symptom. Fœtor of the breath is present, and is caused by retained secretions, or by the cheesy exudations from the crypts of the tonsils. Such children are most liable to diphtheria and scarlet fever, and in them it causes a violent and malignant sore throat.

Treatment.—I doubt if it is possible to remove the enlarged tonsil or adenoid growths by medicines, although I have seen improvement follow the continued administration for weeks of iodide of barium or thuya. If the child presents all or nearly all the symptoms above mentioned surgical interference is necessary. The enlarged tonsils must be cut down, not cut out. When shaved off they will contract and be absorbed under the influence of iodine or chromic acid. The former can be used with a brush, full strength; the latter cautiously, a fifty per cent solution, a mere film applied

once a day, and none allowed to be swallowed. If the cutting operation is not permitted the crypts should be cleaned out with a small curette, and the cavities touched with aristol, iodine, nitrate of silver, or eucalyptol. The removal of the adenoid growths should be insisted on.

Parents should be informed that the trouble is serious, and if not removed will endanger the mental and physical health of the child. The operation is easily performed. The patient should be etherized, when the growths can be readily removed with the finger-nail, or a suitable curette, not too sharp. Great improvement follows in a few days, which is sure to satisfy the parents of the importance of the operation. If the lower jaw still drops, as it may do from habit, a chin strap should be applied at night to hold it up. It may be a long time before the child can articulate clearly and distinctly. If possible give the child cod-liver oil with syrup of iodide of iron, or iodide of iron 2x, with phosphide of zinc 3x.

DISEASES OF THE ŒSOPHAGUS.

Inflammation of the œsophagus is not a rare disease, though it is not often recognized. It may be caused by extension of catarrhal inflammation from the pharynx; by such chemical irritants as sulphuric acid, carbolic acid, caustic ammonia, phosphorus, etc.; by drugs, tartar emetic (pustular), veratrum, and gelsemium (erythematous); by very hot liquids; by extension of diphtheria, and during small-pox.

The symptoms are pain on swallowing referred to the space behind the sternum, the food seeming to lodge there.

The treatment is not very satisfactory. In two cases caused by gelsemium, phosphorus relieved. Barium helps when the food causes pain just above the cardiac orifice of the stomach. Belladonna ought to be beneficial; swallowing bits of ice, or eating ice-cream slowly is very grateful to the patient.

Spasm of the œsophagus, or spasmodic stricture, is met with in hysterical or hypochrondriacal patients, in chorea, epilepsy, and hydrophobia. It may be present during pregnancy. It may be caused by grief.

Naja, according to Hughes, is a very useful remedy. Ignatia and

asafœtida are the remedies for hysterical men and women. The œsophageal spasms of women are benefited by chloroform water, a teaspoonful every hour.

Baptisia if only water can be swallowed. Muriate of sodium and bromide of potassium when only solids can be swallowed. Hydrophobium ought to be useful in this condition.

Arsenic when the œsophagus seems to cramp—also cocculus.

Aconite has been beneficial, also belladonna, hyoscyamus, and lachesis.

In some cases a cure follows the single passage of a *bougie*.

Gelsemium is homeopathic to alternate spasm and paralysis of this tube.

DISEASES OF THE STOMACH.

ACUTE GASTRITIS.—ACUTE GASTRIC CATARRH.

This is one of the most common of complaints. It generally arises from errors of diet; eating too much food of any kind; eating partially decomposed or very irritating food; a few spoonfuls of highly-seasoned soup may bring it on; an American or Englishman cannot eat the foods of Spain and Mexico, highly seasoned with pepper, for the first time without the danger of an attack; alcohol is a common cause; a fright, or mental labor just after eating, will in many persons cause an attack; finally, I believe it may appear as a result of a common cold attacking the stomach first before any other mucous surface.

The appearance of the stomach, according to Beaumont's observation in the case of St. Martin, who had an opening into that organ, showed that in acute catarrh the mucous membrane is reddened and swollen, less gastric juice is secreted, and mucus covers the surface; slight hemorrhages and even erosions may occur. Mild cases last not more than twenty-four hours, and are attended with headache, nausea, eructations, and vomiting which gives relief by expelling the contents of the stomach. The tongue is heavily coated, and there is an increase of saliva, with a sensation of dryness of the mouth. In many cases there are intestinal symptoms, colic, and diarrhœa, especially in children.

In severe cases fever attends it. The temperature may rise to

102° or 103°, with quick pulse. There may be in children delirium and convulsions. The tongue is heavily furred, yellow or brown, with offensive breath. The vomiting may be severe—a continuous rejection of food and water, and ejection of mucus and bile, or mucus tinged with blood. The region of the stomach may be tender to the touch, and the abdomen distended. Herpes may appear on the lips. The fever may last five or seven days. Some writers doubt the existence of a gastric fever, and call it a mild or aborted typhoid, but I believe there is a true fever from gastric inflammation.

Treatment.— If there is reason to suppose that the stomach contains irritating or fermenting food it should be cleared out by a warm-water emetic, or apormorphia, one-tenth of a grain. It is better in some cases to give a dose of castor oil, or five grains of mercurius dulcis, than to allow it to remain in the stomach or pass into the bowels and remain there undigested.

For the fever aconite or gelsemium is generally sufficient. The irritation of the mucous coat of the stomach should be allayed by lime water and milk, equal parts, or hot water. Water sipped as hot as can be borne is more effectual in arresting the vomiting and pain in the stomach than is generally supposed. It has removed very grave symptoms in some of my patients after the failure of medicines. Some patients are benefited by ice pills, others by iced apollinaris or Vichy water. A favorite remedy in cases of children is the following:

℞ Bismuth . . . . . drm. i.
Chloroform water . . . . . oz. i.
Cocaine . . . . . gr. i.
Distilled water . . . . . oz. iii.

A teaspoonful every hour.

It is useless to name many medicines for this condition.

Arsenic is valuable in severe cases that threaten to end in erosion or ulceration. The intense thirst, constant vomiting, burning pain, anxiety, and prostration, indicate it.

Ipecac will control mild cases characterized by nausea and vomiting.

Iris versicolor is useful in many cases when arsenic is prescribed in a routine manner. It is especially useful in acid vomiting with headache over the eyes.

Mercurius dulcis 2x, a grain every hour, will cure a majority of all cases in children; for adults the 1x should be prescribed.

Nux vomica is the best remedy when indigestible food or alchohol is the cause.

Veratrum album is often indicated, and its symptoms should be carefully compared with arsenic.

Nitrate of silver 8x has cured some very bad cases.

CHRONIC GASTRITIS.—CHRONIC CATARRH OF THE STOMACH.—CHRONIC DYSPEPSIA.

The conditions above named may be defined as a chronic state of disturbed digestion, associated with an increased quantity of mucus; qualitative or quantitative changes in the gastric juices; enfeeblement of the muscular coats of the stomach, whereby the food is retained in that viscus longer than is normal; and finally, abnormal changes in the structure of the mucous coat of the stomach.

Causes.— It generally supervenes on acute attacks of acute gastritis, or it may come on slowly and insiduously from —

(1) Improper habits — viz: Unsuitable and improperly cooked foods; the use in excess of fatty foods; of tea, coffee, or alcohol; eating at irregular hours; eating too much, rarely eating too little; eating too rapidly and chewing the food too little; drinking too cold or too hot drinks; the injurious habit of drinking ice-water at meals; the excessive use of tobacco; lunches between meals, before the food of the previous meal is out of the stomach.

(2) Anæmia; Bright's disease; chronic heart disease; cancer, ulcer, and dilitation of the stomach; engorgement of the portal circulation; and mental emotions of a depressing nature.

(The pathological changes are fully described in recent text-books.)

Symptoms.—Impaired and variable appetite, distress and oppression after meals in the epigastrum or under the lower half of the sternum; tenderness over the region of the stomach; coated tongue, bad taste in the mouth, the tips and margin of the tongue red; increase of the pharyngeal secretions; pyrosis; rising of burning, scalding fluids in the œsophagus; nausea in the morning or after meals; burning eructation of gas and bitter sour fluid, with particles

of food; a fermentation of food that remains in the stomach too long; constipation, or diarrhœa of undigested food; headache, melancholia, vertigo, irritability of temper, cough, sleeplessness, or tendency to sleep during the day. These are a few only of the multitude of symptoms. Each case should be studied by itself, no two being alike. No two cases require the same diet or medicines; there is no routine successful treatment.

Treatment.—The treatment of chronic dyspepsia may be divided into (1) dietetic; (2) hygienic; and (3) medicinal.

(1) The patient must eat regularly, but not too much. The food should be well masticated, well-cooked, neither under-done nor over-done; not over eight ounces of fluid should be taken with the meals, and this toward the end. The variety of food should be limited; too many courses are injurious; not over one drachm of alcohol (in wine or other liquor) should be taken during or after meals, none at all at breakfast or lunch, except for special reasons, and tobacco should not be smoked before meals.

There are no cast-iron rules of diet, for "what is one man's food is another man's poison." Pepsin and other digestives should be used very judiciously. In old and bad cases a rigid milk diet should be tried. If the patient asserts that he cannot bear milk, he is mistaken. He may not be able to drink milk with his meals, but he may be able to use it alone as a food. He may not be able to digest it in its ordinary condition, but may digest it well when violently shaken for a minute. If he cannot digest milk, buttermilk or koumiss may digest perfectly, or milk may digest well if mixed with equal parts of Vichy or other alkaline water, or even if slightly salted. In some cases it is best to remove the cream. In other cases cream and water should be used. Milk should always be taken warm, and sipped slowly. In whatever form it is used, milk should be taken in definite quantities and regularly, six to eight ounces every three hours. Peptonized milk will not suit all cases. It does not agree with a patient that has a dilated stomach. The stools should be watched, and if undigested milk appears in them, eggs or some farinaceous food should be added. If the milk diet does not cure, we must ascertain by the process of exclusion what articles of diet agree or disagree. A cure may be effected by cutting off one or more articles of food. The first thing to be excluded is hot bread. This

is a prominent cause of chronic dyspepsia. Replace it with good bread twenty-four hours old, and all the rest of the meal may be well borne. If not, try "Zweibach," or thoroughly toasted bread, not held before a fire, but baked in a hot oven so that the starch is changed to glucose. If this does not suffice, cut off all pastry. A well-made pie is not indigestible, except in some instances. Tarts, cakes, pancakes, ice-cream, and rich puddings should all be excluded in bad cases; or one after the other until we are satisfied which gives offense. Sugar and certain acids may have to be forbidden. Rich, high-seasoned, or greasy soups are generally bad. The fat of bacon and good butter rarely disagree. Certain fruits always disagree with some persons. Fruit should not be eaten after dinner, but as a rule at the beginning of a breakfast or lunch. The above are only suggestions, hints which may serve as a guide in the study of individual dietetics.

Hygienic.— Mental influence goes a great way in the treatment of dyspepsia. The victim is usually morbidly introspective. He eats without enjoyment because he fears each dish will disagree. After the meal is over he watches for pain or discomfort to follow. If he eats alone, matters are worse. He should eat in cheerful company and keep his mind off his food after selecting the dishes, and not think of them after he has eaten them. Cheerful conversation during and after meals is an enemy to dyspepsia. Many of the most confirmed dyspeptics have been cured by going into the pineries and eating pork and beans with corn bread among the rough wood-cutters who make meal-time a season of laughter, jokes, and pranks. A dyspeptic will go fishing or hunting and eat the hardest fare without a twinge of gastralgia. The same food eaten at home would require the services of a doctor. Of course I do not imply that a patient with an ulcerated or eroded stomach can be benefited by such a regimen, but the dyspepsia from purely functional causes, however, can be benefited, for in such cases the mind has a great influence. Patients should not exercise much or violently after meals. Repose is the law of nature. The man who dozes after dinner is rarely a dyspeptic. Nor should a dyspeptic engage in mental labor after meals, for when the brain is excited the blood is attracted to that organ and away from the stomach, which should be slightly turgescent during digestion. Light reading, a novel or the newspapers,

should be the extent of the mental exercise. A change of air or a change of occupation does wonders for some dyspeptics.

Medicinal.— There is scarcely a drug in the materia medica but has in its pathogenesis some dyspeptic symptoms. In rare cases any one may be indicated. Lilienthal gives the symptoms of more than one hundred, yet of all of them there are only few of any considerable value. The following are mentioned in the order of their importance: nux vomica or strychnine, arsenic, euonymin, abies, ignatia, arnica, hydrastis, antimony, aurum, bismuth, bryonia, carbo vegetabilis, chelidonium, china, helonias, creosote, lycopodium, mercurius corrosivus, muriatic acid, nitric acid, podophyllum, pulsatilla, iris versicolor, sanguinaria, sulphur, and anacardium. The special symptoms are so admirably given by Lilienthal that I refer the reader to his "Therapeutics."

My own experience with medicines may be of value, but I can give only a brief resumé. As arsenic is the typical remedy in acute gastritis, so it is in the chronic form. It is capable of causing all the phenomena of imperfect, slow, and painful digestion. Its action is primarily on the mucous membrane, which it irritates to such an extent that an abnormal amount of mucus is thrown off, and becomes itself an irritant; all arsenical catarrhs are acrid and irritating, the mucosa is injected, and after a time becomes eroded and ulcerated. Gastric pain is often violent and attended by sudden prostration, and occurs after taking food. The pain is burning, often confined to one spot; there is pain and pressure in the large end of the stomach, which may radiate up the œsophagus and to the heart; there is great thirst, but the patient is often able to take only a little fluid at one time. In no form of gastritis does the general system suffer so much as in the arsenical. We know that arsenic causes peripheral neuritis, ending in paralysis. Its action on the nerves of the stomach is of this character. Its final action is to cause atrophy of the gastric glands with destructive lesions of the mucous coat attended by paresis of its nerves.

A study of its pathogenesis will show all these varied conditions. When we have selected arsenic for a chronic gastritis, the choice of the preparation is important. I prefer Fowler's or Valengin's solution, one drop of 3x. The 1x should be made with water, above that with alcohol. The dilution selected will depend on the amount

of irritation in the stomach. In rather torpid, chronic cases of drunkards, the crude drug acts well; in severe cases the 3x or 6x.

I consider nux vomica and its alkaloid, strychnine, to be indicated in a majority of cases, not only by their symptoms but by their physiological effects. It is well known that the secretion of gastric juice is under the control of the nerves which supply the stomach, and that these nerves are in turn controlled by reflex influence from other organs, chiefly the brain.

Nux vomica exercises more control over all these nerves than does any other drug. Experiments have proved that strychnine increases the amount of gastric juice, as well as the movements of the muscular coats of the stomach, consequently it increases the digestion, and also the assimilation of foods. In dilatation of the stomach it acts as marvellously as it does it dilatations of the heart. There is only one contra-indication for it, namely: when there is an excess of gastric juices; and possibly a high dilution might be indicated in that condition. Some cases respond to nux vomica, others are better affected by strychnine. Do not be afraid to use nux in one to five drop doses of the tincture in adults; nor the one-fiftieth of a grain and upward of strychnine. They act best when given shortly after eating. When the gastric juice as well as the muriatic acid is notably diminished, it is necessary for a time to give this digestive acid in connection with the nux vomica. One of the most successful of all formulas is: tincture of nux vomica, two drachms; strychnine solution, one grain; pure pepsin, four drachms; dilute muriatic acid, four drachms; glycerine, one ounce; distilled water, seven ounces. Give a teaspoonful before or just after meals.

Ignatia may be substituted for nux vomica in some cases, especially in women. When the catarrhal condition of the stomach is extreme, and the patient vomits mucus alone or mixed with food, hydrastis may take the place of nux vomica. Sometimes the white alkaloid acts better than the tincture, in doses of one-tenth of a grain to each teaspoonful of the above mixture.

Bismuth equals nux vomica in its power over dyspepsia, but its sphere is different. It is a sedative to the nerves of the stomach, and is indicated in those cases where the prevailing sensations are pressure as from a weight in the stomach, with constant eructations, lasting until the stomach is empty. One drachm of the crude drug

can be added to the above formula, leaving out the nux and muriatic acid. The pain of bismuth occurs very soon after meals, that of nux and its congeners not for an hour or two after. There is another group of medicines that cause painful sensation after the stomach is empty, which are relieved by eating again: anacardium, arnica, chelidonium, turpentine, lachesis, petroleum, all have this symptom.

The medicines of most value when flatulence in the stomach is the principal symptom are: muriate of sodium (2x, up to using it freely on food), lycopodium (mother tincture to 30th), carbo vegetabilis (ten grains of the crude drug to the 3x), creosote (2x), salicylate of soda (one to three grains), oil of wintergreen (1x or mother tincture), bismuth, and mercurius dulcis (1x to 3x).

When there is an excess of acids other than muriatic, iris versicolor, podophyllum, sanguinaria, robinia, carbonate of calcium, nux vomica, and pulsatilla, are the homeopathic remedies. If these fail use the vegetable or mineral acids. Sour fruit without sugar, cider, lemon and lime juice, nitric and phosphoric acids, and even soured beer has effected cures; carbolic acid, thymol, boric acid, sulphite or sulpho-carbolate of soda, eucalyptus and other antiseptics have cured dyspepsia with formation of acid ferments.

If muriatic acid is in excess, bicarbonate of soda or magnesia, or lime water, are effectual remedies. They unite with the acid, forming unirritating muriates of soda, lime, and magnesia. In the acid indigestion of children, lime water and the "milk of magnesia" are indispensable medicines, giving at the same time as radical curative agents, iris, carbonate of calcium, and rheum.

Euonymin is one of the most potent remedies we possess for the so-called bilious dyspepsia; the tongue is yellow, breath offensive, frontal headache, pale stools, bitter eructations, and slow pulse, indicating feeble circulation, especially in the portal system, call for this medicine; when given in the 1x to 3x triturate it rarely disappoints. If it does not cure, use its congeners, iridin, leptandrin, podophyllin, or salicylate of soda, in the same doses, giving a dose before meals and at night.

Pancreatin, ptyalin, papayotin or papoid, and diastase are all useful, especially where the digestion of starch and fat is imperfect. Pancreatin should be combined with bicarbonate of soda, five grains

of each (tablets are preferable) given an hour after meals. Ptyalin is not much used. Diastase is an excellent remedy when starchy food ferments and sours in the stomach. A diastase solution in teaspoonful doses after meals, can be repeated if necessary every half-hour. "Malt with pepsin and pancreatin" is of great value in similar cases. Dose, a tablespoonful.

Papayotin is prepared from the juice of the papaya, a native of Florida and the West Indies. It is the most powerful digestive of meats and starch yet known. It is the milky juice of the green fruit, which looks like a small melon. The leaves are said to contain it. Tough meat wrapped in the green leaves becomes tender in a few hours. While visiting on Merritt's Island in the Indian River, South Florida, I met with an old physician who had lived there many years. He informed me that many confirmed dyspeptics had been cured by eating the ripe fruits and the seeds. These seeds are pungent and taste like mustard. A few eaten before and after meals enabled me to eat heartily of food which I did not dare eat without them. The juices of the fig, pineapple, and some other tropical fruits possess the same digestive principle.

George Herschell, M.D., Physician to the Children's Hospital, London, writing of papoid, says: "It is to Dr. Finkler (Professor of Physiology at the University of Bohn), that the medical world is indebted for devising a preparation that is uniform in its effects. Finkler's papoid will digest 1000 to 2000 times its own weight of moistened fibrin when warm, and softens muscular tissues in half an hour. Although so powerful, living membranes are not acted on, and thirty to seventy-five grains have been administered to dogs and rabbits without untoward results. It acts in either acid, alkaline, or neutral solutions, and when it has come into contact with fibrin, adheres to it with such tenacity that no amount of washing will remove it or stop its action."

For practical purposes, as a digestive ferment to be given medicinally, papoid presents the following advantages over pepsin and pancreatin:

(1) It will convert or digest many more times its own weight of meat than they are able to do.

(2) It can be used when pepsin and pancreatin are contra-indicated or powerless. This is the case when

(a) The stomach contents being too highly concentrated, pepsin ceases to act. On the other hand, papoid acts energetically even when the specific gravity of the stomach contents reaches 1.030 or over.

(b) When there is such a deficiency of hydrochloric acid in the stomach that pepsin is inactive. Pepsin, as we know, can act efficiently only in the presence of a certain quantity of acid. That is to say, that the inactive proenzyme requires a certain percentage of acid to convert it into an active ferment. Papoid, on the other hand, being independent of the presence of an acid, will do its work even under these conditions.

(c) When the stomach's contents are so acid that, poured out into the duodenum, they inhibit the action of the pancreatin ferment. It not infrequently happens in cases of hyperacidity of the stomach that the intestinal juices are unable to neutralize the intensely acid chyme. As the pancreatic ferment can act only in the presence of an alkali, duodenal digestion is at once arrested and various unpleasant symptoms supervene. It is obviously of no use to give pancreatin by the mouth, as it is at once destroyed by the acid in the stomach. And in these cases it is of no use to give an alkali with it, as is often done, as it would be practically impossible to give a sufficient dose to neutralize the contents of the stomach without damage to the organism. Papoid is here of the greatest use, as its activity is not affected by the contact with acid.

(3) As regards albuminoids, it combines in itself the joint action of pepsin and pancreatin.

(4) It can be combined with acids, alkalies, or antiseptics, as indicated by the demands of the case.

(5) It has a local action on the stomach that pepsin has not.

(a) It has a distinct tonic action on the secreting mechanism of the stomach, stimulating the secretion of the gastric juice.

(b) It has a local sedative action, relieving pain in a marked degree, and this it does whether the pain is due to the presence of irritating ingesta, or is a local neuralgia.

(c) It dissolves the unhealthy mucous coating of the interior of the stomach that interferes with the gastric secretions and the absorption by the stomach walls. This condition is met with chiefly in the chronic stomach catarrhs of children, in cases of alcoholic dyspepsia, and in most cases of chronic gastritis.

(d) It is distinctly antiseptic in its action. It thus prevents the abnormal fermentative processes from taking place in the stomach and intestines. An important point in its favor is that it can be given in conjunction with other antiseptics, when necessary, without its action being in any way interfered with. This is not the case with pepsin.

(6) And last but not least, being purely vegetable, it is not so repulsive as pepsin. With animal ferments, prepared from stomachs of pigs and other animals, there is always a possible doubt as to the freshness or healthy condition of the material. If at all tainted they may contain bacilli, ptomaines, and other toxic substances, particularly as in preparing pepsin and pancreatin it is impossible to raise the temperature high enough to destroy these without rendering the ferment also inert.

From a consideration of the foregoing we see that papoid is indicated in the following conditions:

(1) Deficiency of the gastric juice from (a) atrophy of the gastric follicles; (b) deficient blood supply. This occurs in anæmia and general debility.

(2) Excess of unhealthy mucus in the stomach. This occurs in chronic gastric catarrh, chronic alcoholism, and in the chronic stomach catarrhs of children.

(3) Irritable conditions of the stomach, associated with pains and vomiting.

(4) Duodenal dyspepsia. When its local action is desired it is given on an empty stomach, and when it is administered for its digestive effect it may be given either with the food or shortly after. (Herschell's Manual.)

Merck's "Juice of the Pawpaw," Wurtz's Papain or Papayotin, and Finkler's Papoid are said to be similar, but this has been disputed. An eminent chemical authority writes me that "Papayotin is a highly concentrated extract of the juice of the pawpaw, and that it cannot be used instead of papoid, or the dried pawpaw juice. It is said to be so corrosive as to prevent its use in large doses, and that it possesses widely different physiological effects." But Dr. Jacobi says papayotin is not caustic, and can be given in doses of five or ten grains, and does act in an acid or alkaline medium. Evidently there is still an uncertainty about the various preparations.

Beef tea will often ferment in the stomach unless a little muriatic acid is added to it. The juice of the pine-apple added to beef tea has the same effect as the acid. "Mosquera's Beef Meal" is predigested by the action of pine-apple juice.

It has lately been discovered that Condurangu bark notably increases the gastric juice. The genuine bark is finely ground and given in doses of five to ten grains. It is said to equal bismuth in its sedative action on an irritable stomach. Columbo has long had a similar reputation. Muriate of hydrastine (white alkaloid) has the same sedative effect. Resorcin, cocaine, kava kava, and boldo are said to have a similar action.

One of the best palliative remedies I ever used in the acid, fermenting, painful dyspepsia of children or adults is the following:

Glycerine, chloroform water, of each one ounce; distilled water, two ounces; a teaspoonful every half-hour until the patient is relieved. To this may be added papoid, one drachm, when there is undigested food in the stomach or intestines.

There are certain mineral springs having a deserved reputation in chronic gastritis. They are all mild alkaline waters. Vichy (European or American); Saratoga waters, alkaline and mildly saline; some of the sulpho-saline springs of this country; Carlsbad in small quantities. But they should not be taken ad libitum, as patients are prone to do unless restricted.

It is not always the water alone at watering places that cures. It is partly the change of air, new scenes, society, and exercise. But the best of water will do no good if the patient eats improper food, and too much of it, while at the springs.

The principle derived from these mineral waters is not their laxative action. When properly used they dissolve and wash away the mucus which adheres to the stomach and intestines, preventing digestion and assimilation.

Carlsbad (native or foreign) has the best reputation, but when used in excess will cause the very condition for which it is recommended.

A small glass of the water, or a teaspoonful of the powdered salts in a glass of water, should be slowly sipped — hot — on rising in the morning before eating. In chronic cases this is repeated before each meal. For mild cases of gastric catarrh with acidity,

the alkaline waters suffice. In chronic cases the saline-alkaline waters are more efficient, such as the springs of French Lick, Indiana, and those near Enterprise, Florida, and similar springs in Kentucky, Virginia, and Pennsylvania.

DILATATION OF THE STOMACH.

This condition may occur from several causes. (1) Acute dilatation from eating or drinking an enormous quantity at one time. Instances have occurred in which the stomach never recovered from the violent distension, and death has resulted from paralysis after excessive eating or drinking. (2) Narrowing of the pylorus or the duodenum by the cicatrization of an ulcer. Stenosis of the pylorus from hypertrophy, congenital stricture, a tumor, or floating kidney. (3) Relative or absolute insufficiency of muscular power of the stomach, due to repeated distension from over-filling, or atony of the coats induced by chronic gastritis, degeneration, etc. The most extreme form arises from stenosis of the pylorus, due to contraction as a sequence of ulceration.

The same condition occurs in the stomach as in the heart. There may be considerable stenosis and but little dilatation owing to compensation-thickening of the muscular coats. This is a physiological cure in the stomach. When with chronic catarrh of the stomach there is habitual over-feeding and drinking, we are sure to find a tonic dilatation of the stomach. The employes of breweries, who are allowed thirty and forty glasses of beer daily, are generally victims of this condition; an exclusive diet of milk has been known to cause it. It is most frequent in middle-aged and old persons, but may occur in children, especially in association with rickets.

The most characteristic symptom, says Osler, is the vomiting at intervals of enormous quantities of liquid and food, amounting sometimes to four or more litres (five or six quarts). The material is often of a dark grayish color, with a characteristic sour odor, due to the organic acids present, and contains mucus and remnants of food. On standing it separates into three layers, the lowest consisting of food, the middle of a turbid dark gray fluid, and the uppermost of a brownish froth. Microscopical examination shows a large variety of bacteria, yeast fungi, and the sarcinæ ventriculi. There may be

also present fruit stones and berry seeds. Owing to the small amount of fluid which passes from the stomach, there is constipation, scanty urine, and dry skin. There is malnutrition, emaciation, and extreme weakness.

Kussmaul says tetanus may occur, the spasm affecting chiefly the muscles of the hands, arms, and legs. I have seen two cases of the kind attending simple dilatation.

"On physical inspection the outline of the enlarged stomach may be plainly seen, the small curvature a couple of inches below the ensiform cartilage, and the greater curvature passing obliquely from the tenth rib on the left side toward the pubes, and then curving upward to the right costal margin. On palpation the resistance of a dilated stomach is peculiar, and has been compared to that of an air-cushion. There is a splashing sound which the patient can cause by depressing the diaphragm.

"When on percussion in the standing posture the bottom line of resonance is even with the navel, or below it, dilatation of the stomach may generally be assumed to exist.

"On ausculation a curious sizzling sound is present, not unlike that heard when the ear is placed over a soda-water bottle when first opened." (Osler.) On auscultating of the epigastric region in some patients for supposed heart disease, I have found the heart sounds transmitted with great clearness and with a metallic sound. In such cases the dilatation of the stomach was the cause of the cardiac disturbance.

Treatment. — Dilatation from stenosis of the pylorus or duodenum cannot be cured, but may be alleviated by aiding compensation. When dependent on simple atony, a careful regulation of the quality and of the quantity of food and drink may enable us to cure the patient. Medicines may further assist in the cure. The associated catarrh must be treated. Strychnine and nux vomica have been found the most useful of all drugs. They contract the fibres of the muscular coats of the stomach and bring about a normal condition in simple dilatation, and aid compensation in stenosis of the pylorus. I have found the alternation of hydrastis, hydrastine, or muriate of hydrastine with nux vomica or strychnine to give better results than any other medicinal treatment; but in old cases these agents even aided by diet are insufficient, and we have to resort.

to Kussmaul's method of emptying and washing out the stomach with warm water alone, or with some innocuous antiseptic solution. The patient can be taught to wash out his own stomach. Osler says he has known the practice to be followed daily for three years with great benefit. The rapid reduction in the size of the stomach is often remarkable; the vomiting ceases, the food is taken readily, and in many cases the general nutrition increases rapidly. As a rule once a day is necessary, the first thing in the morning or the last thing before going to bed. In the morning there is usually a large amount of mucus (catarrhal) in a dilated stomach. This can be partially digested and loosened by taking two grains of papoid with a few grains of bicarbonate of soda, and sipping half a glass of hot water slowly before washing out the stomach.

As there is more or less deficiency of gastric juice in such cases, pepsin or papoid with muriatic acid should be taken with the food.

One of my patients who had tired of milk and buttermilk found malted milk very grateful and beneficial.

NEUROSES OF THE STOMACH.—(GASTRALGIA, GASTRODYNIA.)

This disease is sometimes called cardialgia, but this name should be adandoned. It is a disease of the stomach, consisting of severe paroxysmal pain in the epigastrium.

It may occur (1) as a manifestation of a functional neurosis independent of any organic disease, and usually associated with other nervous symptoms; (2) in chronic diseases of the nervous system forming the so-called gastric crises; and (3) in organic diseases of the stomach, as ulcer or cancer.

Drs. Salter and Clifford Allbutt relate cases which alternated with asthma, pseudo angina-pectoris, and enteralgia, and I have known it to alternate with ovarialgia; others report cases where it alternated with hemicrania or megrim.

Gastralgia often ceases suddenly, and in its place obstinate vomiting of food will occur.

The symptoms are quite characteristic; the patient is suddenly seized with agonizing pains in the epigastrium, which pass towards the back and around the lower ribs. The pain is described as

cramping, constricting, twisting, cutting, shooting, darting, boring, aching, burning, and many other adjectives expressing violent forms of pain. Some will complain of a sensation as if ice or a cold stone lay in the stomach; others of an intolerable sinking, faint, deathly feeling there, with an insatiable craving for spirits, and hot or cold drinks

True cardialgia usually occurs independently of the taking of food; it may occur at definite intervals, and be so periodical as to resemble the paroxysms of malaria. In fact it does occur during malarial attacks, and takes the place of the accustomed chill. It frequently comes on at night, waking the patient from sleep. Vomiting is rare; more commonly the taking of food relieves the pain, but to this there are notable exceptions, as when a spoonful of any fluid or solid will terribly aggravate. Pressure may give relief, but deep pressure may be painful. During the paroxysm the pain may suddenly leave, and all the symptoms of an angina-pectoris set in, or it may be replaced by an enteralgia. I have known all the pains of a dysmenorrhœa to leave suddenly and appear in the stomach. All these facts point to a constitutional or central neurosis.

Treatment.— In this disease is shown the futility of trying to select a remedy from the local symptoms alone. Such a remedy may palliate, but rarely cures. It is like treating hysteria from the symptoms alone, or like chasing a "will o' wisp." We must treat the constitutition, or the neurosis, by remedies which are capable of causing similar conditions.

The palliative treatment in violent cases must consist of those agents that are distinctly anodyne. Patients will have immediate relief if possible, if this is not accorded them they doubt your ability to combat the disease. Hypodermic injections of codeine phosphate, one-fourth to one-half of a grain, generally affords quick relief. Morphine, or morphine with atropine, is also efficient. Chloroform by inhalation may be given if convulsions threaten; a teaspoonful every ten minutes of chloroform water is often sufficient to relieve the pain. Hot applications externally and hot drinks are often of value. Cocaine, one-tenth to one-fourth of a grain, in cases marked by excessive hyperæsthesia and vomiting has been used with benefit.

Chamomilla, coffea, dioscorea, phosphate of magnesia, cocculus,

ignatia, nux, and colocynth have often relieved the worst cases when closely affiliated. I have never known carbo vegetabilis in any dose to act as a palliative.

The medicines most efficient for the removal of the local pain and the general neurotic state are nitrate of silver, asafœtida, arsenic, bismuth, aurum, cinchona or quinine, arsenite of quinine, arsenite of strychnine, nux vomica, ignatia, ferrum, hydrastis, phosphorus, pulsatilla, sepia, picric acid, bromide of strontium, cyanide of zinc*, bromide of gold, sulphur, the hypophosphites, etc.

The hygienic and climatic treatment is similar to that recommended for neuræsthenia.

Nervous Dyspepsia requires about the same medicines and hygiene (see gastric neurasthenia).

Peristallic Unrest.—Kussmaul was the first to describe this condition. Shortly after eating, or upon any emotion, the peristallic movements of the stomach and intestines are increased, and borborygmi and gurgling in the stomach and abdomen are heard by the patient and others, even at a distance. It is a part of the same hyperæsthetic condition of the nervous system as that in which a patient feels the normal beating of the heart. In some cases the movements of the intestines are distinctly felt, also the migration of the gases from one place to another. I have had patients so annoyed by the noises in the abdomen that they deserted society and public gatherings. I consider this condition similar to another still more distressing, in which soon after eating, or under any sudden emotion, the patient has an immediate desire for stool, which sometimes can be controlled, at other times not. A variety of this condition affects the urinary organs, when after drinking, or hearing running water, a desire to urinate, often very urgent, occurs.

Treatment.—I have never found any remedy to cure this hyperæsthesia, although I have tried lycopodium, dioscorea, thuya, turpentine, phosphorus, nux moschata, and many others. In desperation some of my female patients have taken opium, a small dose, just

* Probably no medicine yet known has such a decided curative action on combined gastric and cardiac neuroses as the cyanide of zinc. With it I have cured cases diagnosed as gastric ulcer, and others as angina-pectoris. In some cases the 1x trituration is required; others are cured by the higher triturations. (See symptoms of stomach and hypochondrium of zinc.)

before going to a reception, with the result that the gurgling was temporarily arrested. The sympathetic or reflex nervous system is at fault, and its hypersensitiveness is a neuræsthenic state. I once thought that the bromides in doses sufficient to dull the reflexes would cure such cases, but I was disappointed.

The true homeopathic remedies are such as will cause a similar hyperæsthesia. Probably nux vomica, ignatia, and strychnine are the most appropriate medicines for the underlying conditions. Sumbul, thuya, phosphorus, lycopodium, and salol may be useful.

HEMORRHAGE FROM THE STOMACH.

Hæmatemestis, or gastrorrhagia, may result from many conditions, some local, others general.

The local causes are cancer, ulcer, miliary aneurisms, varicosis, acute congestion due to obstruction in the portal system; and from hepatic, cardiac, or splenic diseases.

The general causes are toxic: as the poison of specific fevers, yellow atrophy of the liver, purpura, phosphorus poisoning, traumatism from blows and wounds, corrosive poisons; and constitutional diseases, as hæmophilia, anæmia, malaria, and cholæmia. It may occur in hysteria and progressive paralysis of the insane. The blood may *not* come from the stomach, but flow into it; it may come from the nose, pharynx, or lungs. It may come from rupture of an aneurism. I have known an infant vomit blood, and have found that it came from the breast of the mother. It may occur during the first two weeks of infant life and prove rapidly fatal; the precise etiology of this form is not known. The two most common causes are undoubtedly ulcer of the stomach and cirrosis of the liver.

Patients may die in profound syncope, without a drop of blood appearing externally. In such cases the stomach is distended with blood to the amount of three or four pounds. Sometimes it is difficult to decide whether the fluid vomited is really blood. It may be the juice of red berries or wine. If the patient is taking iron or bismuth, the vomit will resemble a black coffee-ground mass, like blood altered in appearance by the gastric juice. Hysterical patients, or malingerers, will vomit fluids resembling blood, but which are

really colored fluids they have swallowed for purposes of deception. In one such case, the girl being closely watched, it was found she chewed log-wood and swallowed the juice.

For differential diagnosis compare the following parallel symptoms:

HÆMATEMESIS.	HÆMOPTYSIS.
1. Previous history points to gastric, hepatic, or splenic disease.	1. Cough or signs of some pulmonary or cardiac disease precedes, in many cases, the hemorrhage
2. The blood is brought up by vomiting, prior to which the patient may experience a feeling of giddiness or fainting.	2. The blood is coughed up, and is usually preceded by a sensation of tickling in the throat. If vomiting occurs, it follows the coughing.
3. The blood is usually clotted, mixed with particles of food, and has an acid reaction. It may be dark, grumous, and fluid.	3. The blood is frothy, bright red in color, alkaline in reaction. If clotted, rarely in such large coagula, and muco-pus may be mixed with it.
4. Subsequent to the attack the patient passes tarry stools, and signs of disease of the abdominal viscera may be detected.	4. The cough persists, physical signs of local disease in the chest may usually be detected, and the sputa may be blood-stained for many days.

Bleeding from the stomach rarely proves fatal unless it comes from gastric ulcers, rupture of an aneurism, a varicose vein, or scirrus of the liver.

Treatment.— Our success in arresting the hemorrhage will depend on the accuracy of our diagnosis. If from ulcer of the stomach, arsenic, turpentine, sulphuric acid, erigeron, thaspium, nitrate of silver, bismuth, and resorcin. If from varicosis, ergot, hamamelis, carduus, collinsonia, hydrastis, millefoil, and sulphuric acid. If from obstruction in the portal system, mercurius, chelidonium, carduus, euonymin, aurum, phosphorus, and mercury. If from injuries, arnica, bellis, sulphuric acid, erigeron, and millefoil. If from splenic disease, china, ceanothus, arnica, and arsenic. If from congestion, veratrum viride, aconite, phenacetin, and aurum. If from cancer, bismuth, charcoal, antipyrin, arsenic, and persulphate of iron. Ice pills, or small swallows of ice-cold water, have been known to arrest bleeding at the stomach. I have known hot water, so hot that none of the attendants could drink it, to arrest hæmatemesis when every other means had failed.

ULCER OF THE STOMACH AND DUODENUM.

Ulcers may occur in the stomach and in the duodenum. They are round, simple, and perforating, and probably follow some disturbance of nutrition in a limited area, which results in the gradual destruction of this area by the gastric juice. Hence the name, "peptic ulcer." It is usually attended by hyperacidity.

Females are oftener affected than males. It is often associated with anæmia and chlorosis, and with menstrual disorders. The duodenal is less common than gastric ulcer. It occurs in tuberculosis and may follow large superficial burns. It might be supposed that the ulcer would occur from traumatism or corrosive substances, but such is not the case. The disease is said to be less common in this country than in Europe. There may be more than one ulcer; cases have been reported where there were five, ten, and up to thirty. The ulcers are most commonly situated on the posterior wall of the pyloric portion at or near the lesser curvature. They may be small and punched out or reach an enormous size. If only the mucous coat is diseased the granulation tissue develops from the edges, and when healed over leaves a smooth scar. If the muscular coat is affected, contraction occurs. The ulcers may last for years without any attempt at healing; they may deepen and penetrate all the coats, or adhesions may form between the stomach and pancreas, liver, or omentum.

Fistulous communication may form into the colon, umbilicus, and even the pleura and pericardium. One of the most serious effects of gastric ulcer is erosion of blood-vessels; the splenic artery may be perforated, or the artery supplying the eroded region may be plugged by an embolus.

The symptoms in general are those met with in chronic dyspepsia. Hemorrhage is present in nearly one-half the cases. It is generally profuse and often in large quantities, and thrown up unaltered; this symptom is quite characteristic of ulcer of the stomach. In duodenal ulcer the blood may pass wholly into the intestines.

Pain is the most constant and distinctive feature of ulcer. It may be only a gnawing or burning sensation, which is particularly felt when the stomach is empty and is relieved by taking food; but more generally it appears in paroxysms of intense gastralgia, in which

the pain is not only felt in the epigastrium but radiates to the back and sides. These attacks are most frequent after taking food; they occur at a variable period after eating, sometimes in fifteen minutes, or may not appear for two or three hours. The pain may occur at intervals with violence day after day for weeks, requiring powerful anodynes; then it will disappear for a long period. Why this should be has never been fully explained. During a paroxysm of pain the patient is usually bent forward, and is relieved by pressure on the epigastrium; one leans over the back of a chair; another lies flat on the floor with a hard substance under the abdomen. But while pressure is grateful during pain, it is not so in the intervals, when there is decided tenderness to the touch, and the patient cannot bear any tight clothing around the waist. There may be a very painful point of limited extent just below the ensiform cartilage, as in a patient now under my care. In old ulcers with thickening, a hard mass can be felt in the neighborhood of the pylorus. This lump I have found in several cases, and a post mortem verified the diagnosis. Stuart says the pain in ulcer of the stomach shoots through to the back, generally to the left. Winslow says the pain is often referred to the region of the spine corresponding to the last two or three dorsal and first two or three lumbar vertebræ, or to the interscapular region—the muscles on either side often being tender. (In five of my cases the pain alternated one day in the back, the next day in front, under the lower end of the sternum.)

The pain may be at the umbilicus, and it has been known to radiate into the sides of the abdomen and up the œsophagus to the throat. These pains are often burning, boring, aching, shooting, or lancinating, with great soreness internally.

Gall-stone colic simulates the pain of gastric ulcer, but the pain of the former stops suddenly, and the swelling of the liver, and jaundice, usually makes the diagnosis clear.

Dr. Clifford Allbutt ("Visceral Neuroses") says: "The cases which simulate gastric ulcer are many. No doubt I have at times mistaken a case of ulcer for gastralgia, and at other times have assumed the existence of ulcer when gastralgia and gastralgic vomiting alone were present, but according to the correctness of our judgment must our treatment be helpful or hurtful, or positively mischievous. Possibilities do not help us much, for I think the ulcerous and pseudo-

ulcerous cases are about equally common." Dr. Allbutt recommends arsenic and the salts of silver, and says he has cured some undoubted cases with them. His observations should make us very cautious in giving a diagnosis, especially in young neurotic women. Hysteria will imitate gastric ulcer perfectly, as I know from some mortifying experiences.

Treatment.— If we are sure of our diagnosis, and the sufferings of the patient are severe, we should resort to the most decisive measures. (1) We should insist on an absolute rest in bed. (2) Rectal feeding until the stomach has a period of inaction. (3) When we begin to feed by the mouth, as small an amount of food as is compatible with the maintainance of life should be allowed; and it should be given in small quantities and at short intervals. Milk is the most suitable food, but not always can it be taken in its natural state. It can be shaken with lime water, or bismuth, or it may be frozen. I once treated an old man of sixty, who had an undeniable large ulcer of the stomach. After all other foods in various forms had been tried and he was nearing exhaustion, frozen milk was given, a tablespoonful every two hours. It caused no pain, and the amount was gradually increased until he took a teacupful every two hours during the day, and occasionally at night, for six weeks, when he appeared so well that he was allowed scraped beef, and gradually other articles. He remained in good health for several years, finally dying of typhoid fever. A post mortem showed the cicatrix of a gastric ulcer on the posterior wall. The only medicine which relieved the paroxyms of pain in his case was codeine, which was given every day for three weeks, an average daily amount of three grains.

Ice-cream has in many cases been the only food retained by the stomach. Two of my cases, women of twenty-five, lived on this food for several weeks, or until other food could be borne. It should be as free from sugar as possible and a little cornstarch can be added. New York ice-cream is the best kind in my experience, but any good home-made ice-cream will do. One of my patients could eat a particularly delicate cake called "angel's food" with the ice-cream (but no other kind of cake or bread), and the ice-cold juice of watermelons. Milk gruels made with arrow root, farina, or some similar preparation, should be tried. Sometimes the essence of beef, mutton, or chicken agrees when milk foods do not. Malted milk has

been satisfactorily used. Mosquera's beef meal or jelly are excellent. Luebe's beef solution, and Weyeth's or Valentine's beef juice in cold water is highly praised. Egg albumen may be used, but it should be only broken up, not be beaten to a froth. Buttermilk was well borne by some patients under my care.

Hot food of any kind is never well borne in gastric ulcer. Hot tea or coffee should not be allowed, while in gastralgia neurosa they nearly always agree. Cold foods and drinks, even ice-cold, are nearly always best. When meats are allowed, only the juices should be swallowed. After a time tender scraped beef, delicate sweetbreads, or frogs' legs, can be tried, in small quantities at first.

The *medicinal treatment* is uncertain, and useless unless the patient rigidly complies with our order of strict diet. The dominant school recommends nitrate of silver, bismuth, and opium. Ziemsen warmly recommends Carlsbad salts, a teaspoonful every morning, though few patients can take it, and if they can it only relieves the gastric catarrh without any specific action on the ulcer. In my cases Vichy was better tolerated than any other mineral water. All recommend opium for the pain, but I find codeine much the best. It requires from one-fourth to one-half of a grain at each dose. Osler recommends for the vomiting, cracked ice, oxalate of cerium, hydrocyanic acid, and ingluvin. For the hemorrhage he recommends opium and ergotin hypodermically. Ringer recommends turpentine, which I have found useful in one case (five drops every two hours), and in another, dilute sulphuric acid (five drops every two hours), I believe saved one patient's life. The only medicines homeopathic to gastric ulcer are nitrate of silver, arsenic, aurum, mercury, bichromate of potassium, phosphorus, stibium, and nitrate of uranium.

Arsenic is the chief remedy. Its symptoms all correspond to ulcer of the stomach, especially when the ulcer is at the pylorus. If our triturations of the arsenious acids are prescribed, not lower than the 6th should be used. The arsenites of potassium and sodium can be given in the 3rd trituration or dilution.

Aurum mur. is certainly indicated in erosion of the stomach if not in true ulceration. The red glazed tongue, pain in the pylorus, vomiting of food, and other symptoms point to severe lesions of the mucosa. If the symptoms of gold and arsenic seem mingled, give arsenite of gold, 3x trituration, before each meal, for it acts best

when the stomach is empty. The symptoms and pathological lesions of bichromate of potassium indicate its usefulness in all round perforating ulcers. It is recommended by Dr. Pope, of England, when the ulcer is at the cardiac end of the stomach. Lilienthal gives the special indications in full, the 3x to 6x being used.

Dr. Blake's experiments with nitrate of uranium show it to have the specific power of ulcerating the pyloric mucous membrane in animals. Dr. Drysdale has shown it to be helpful in existing ulcer in man, and it may have the power to prevent ulceration.

Nitrate of silver is indicated when there is pain below the zyphoid cartilage, in a small place extending to a corresponding point in the spine where pressure aggravates it. We use the 3x aqueous dilution. Osler and Bristowe recommend one-fourth grain in four ounces of water, drank on an empty stomach.

Subnitrate of bismuth is a favorite with all schools. It doubtless has some specific curative, as well as profound sedative or palliative action. The severe pressing, burning pains, the sensation of weight and a load in the stomach, the intractable vomiting, all point out its value. If the drug is pure and free from arsenic the dose may range from one grain to thirty of the crude drug. I have frequently given one drachm before each meal, with no other than excellent results. Belladonna, atropine, conium, carbo vegetabilis, nux vomica, oxalate of serium, hydrocyanic acid, are only palliatives. An infusion of peach leaves often acts better than hydrocyanic acid. In one case great relief was obtained by eating a kernel of bitter almond before a meal. Dr. Habershon ("Diseases of the Stomach") recommends carbolic acid, one drop, or oxide of silver, one-fourth grain, and creosote, one drop, to relieve the pain and vomiting.

Cunduranga bark is said by some German physicians to have an undoubted curative influence over gastric ulcer. Given in doses of three to five grains of the finely pulverized bark, it alleviates the pain, stops the vomiting of food, and the patients improve rapidly under its use. In cancer they found it useless.

Muriate of hydrastia (white alkaloid), owing to its almost specific influence over gastric catarrh, and its sedative influence upon the mucous coat of the stomach, may be of great assistance in the treatment of ulcer. I have no doubt cases occur in which mercurius corrosivus, phytolacca, sulphur, and barium may be of value.

CANCER OF THE STOMACH.

It is said to be more frequent in England than in this country. Three-fourths of all cases occur between the ages of forty and seventy. It seems to be hereditary to a certain extent. Welch found a family history of cancer in 248 out of 1,744 cases. The stomach comes next to the uterus as the most frequent seat of primary cancer. Three varieties of gastric cancer are named: the encepholoid, scirrous, and colloid. In 1,300 cases, 791 were in the pyloric region; lesser curvature, 148; cardiac, 104; posterior wall, 68; anterior wall, 30.

Most of the symptoms (subjective) of cancer of the stomach are similar to those of ulcer, but cancer of the stomach may not produce symptoms other than gradual failure of health, and death may take place from asthenia without any suspicion of the existence of malignant disease.

There is a peculiar cachectic appearance of the patient with cancer that we rarely see in ulcer. There is also an expression of the face, drawn, sad, and hopeless, which is also seen in cancer uteri. I believe I have been able to diagnose cancer of the stomach or uterus in many cases by this expression alone.

In pernicious anæmia patients may have the cachectic appearance, but not the facial expression. Welch ("System of Medicine") gives an elaborate diagnostic comparison between cancer, ulcer, and catarrh of the stomach, but after reading it, one feels that the diagnosis is very uncertain.

Treatment. — There is no special treatment and the disease is incurable. The same remedies recommended under ulcer should be used, for thereby we may be able to benefit the patient, even if we do not remove the cancer.

There is a case of supposed scirrous of the stomach reported in "Therapeutics of New Remedies" in which hydrastis partially removed the tumor. (Dose, two drops morning and evening.) In the "North American Journal of Homeopathy," 1874, Dr. Frederick reported a case of corcinoma ventriculi, with co-affections of the epigastric and sub-clavicular lymphatic glands, cured by four drachms of the bark to half a pint of hot water, a tablespoonful twice a day. Dr. William Owens, of Cincinnati, values acetic acid highly in can-

cer of the stomach. He says: "As a therapeutic agent acetic acid liquifies albuminous and fibrinous deposits as they are found in the various forms of hyperplasiæ, indurations, and infiltrations, all the products of acute or chronic inflammation. It has proven particularly valuable in the treatment of epithelioma, cancerous affections and in the indurated chancre of primary syphilis. It is said to be the only agency that can liquify and disorganize the cancer cell.

"Montgomery has demonstrated that it is capable of converting protagon into the round and spindle-shaped cancer cell.

"In treating the cancerous patient we use locally the 2d dilution of acetic acid No. 8, and keep the part moist all the time, while we give internally the 1st dilution usually every four hours. The same course is pursued in treating epithelioma. In a few weeks exfoliation takes place, which continues until it leaves a healthy surface. Two cases of cancer of the stomach may here be referred to, both in well-known citizens.

"Mrs. M., sixty-three years, had been under treatment for an affection of the stomach supposed to be cancerous, and had been so diagnosed by three physicians who were thought to be thoroughly competent. Every day she vomited partly digested food, sometimes mingled with blood. Had been constipated for about two months and had no stool for twenty-one days; nodules as large as walnuts could be distinctly felt about the pylorus, and some degree of tenderness extending across the stomach. The immediate occasion for my call to the case was the vomiting of a peculiar glairy gruel-like substance, mixed with partly digested food, mucus and slime, which the attending physician did not seem to understand. After a careful examination it was agreed that we probably had a case of cancer of the stomach or pylorus to deal with. Acetic acid, 1st dilution, was given every hour. There were two slight returns of the vomiting within the next two weeks. Improvement set in and continued. The dose was continued at longer intervals, and at the end of four months the patient was well and has so remained to the present time."

"A second case, Mr. T., fifty-two years, had been under the medical charge, at different times for about two years, of three physicians, during which time more or less vomiting of undigested food had taken place, getting each month worse until about six weeks before I saw him. He then vomited each night all he had taken

the day before in a partly digested state, with mucus and slime. He had had no stool for two weeks previously, though the syringe had been used daily. Acetic acid, 1st dilution, was given every hour; the syringe was used twice each day. In four months from the time he was seen, to a day, he walked out for the first time. There has been no indication of return of the trouble now nearly one year past."

DISEASES OF THE INTESTINES.

CATARRHAL ENTERITIS.—DIARRHŒA.

There seems at present to be a concensus of opinion among pathologists that the anatomical division of enteritis into duodenitis, jejunitis, ileitis, typhilitis, colitis, and proctitis should be abandoned, for in the majority of cases the entire intestinal tract to a greater or less extent is involved; sometimes the small intestine, sometimes the large bowel, but during life it is not always possible to say with any certainty which portion is specially affected.

The causes may be either primary or secondary. Among the primary causes are: (1) Improper food, over-eating, especially of unripe fruit. In some persons certain articles of diet will cause diarrhœa, while the same articles never affect others. (2) Various toxines, such as the organic substances produced in the decomposition of milk, custard, and impure water; or any change of drinking water; drugs of various kinds; changes in the weather, especially in the spring and fall when the temperature falls rapidly twenty or thirty degrees, or hot days and cool nights; excessive heat of summer, especially in cases of children. A cold commencing as a coryza may travel the whole course of the digestive tract, causing catarrhal diarrhœa. (3) Increase of bile in the intestinal canal causes a diarrhœa termed bilious. Scanty secretion of the bile favoring fermentive processes, is a common cause of diarrhœa. Scanty pancreatic secretion has been supposed to cause the so-called "fatty diarrhœa," but Vierordt ("Medical Diagnosis") says: "The increase of fat in the stool is not, as was formerly assumed, characteristic of a want of pancreatic juice (in disease of the pancreas); the absence of pancreatic juice does not seem to hinder the resorption of fat." He says the fat needles found in the stool may result from shutting off the bile from the intes-

tines, from enteritis, and from disease of the mesenteric glands. (4) Nervous influences. In some neurotic persons any sudden or intense emotion may cause an increase of the peristaltic motions, and even increased secretion from the bowels. In children, it follows fright. In women, sudden joy or grief. In men, a telegram, or the news of a battle. During the civil war hundreds of soldiers were rendered non-combatants on the eve of a battle because of sudden prostrating diarrhœa. In hysterical persons this tendency may cause a veritable and obstinate chronic diarrhœa.

Among the secondary causes are fevers, typhoid, bilious, and malarial; dysentary, cholera, pyæmia, septicæmia, tuberculosis, and pneumonia; chronic affections of the heart and lungs, liver and rectum, particularly a diseased condition of the pockets and papillæ, or fissure and ulcer; in the latter there is a continuous diarrhœa, peculiar and obstinate, which an operation only will cure. (See Diseases of the Rectum.) We also find diarrhœa in cancer, Addison's disease, Bright's disease, and anæmia.

Symptoms.—The stools may be of any color, and different shades of colors or of mixed colors. These colors are supposed to be influenced by the amount of bile mixed with the stools. A very dark green hue is supposed to indicate that it is mostly made up of bile, but the stools caused by mercury and some other drugs are very green, due to a chemical change; and the grass-green stools, especially of children, may consist of altered blood, or may be due to a specific micro-organism, as the microscope has shown. Pain is a general but not invariable symptom, and usually indicates an acute catarrhal condition, or the presence of food in the intestine.

In attempting to make a diagnosis of the seat of the enteritis it may be noted that the stool from the small bowel usually contains portions of food, is more yellowish-green, or grayish-yellow, and flocculent, and does not contain mucus; the diarrhœa is less marked, the pains colicky, and borborygmi infrequent. The large intestine, on the other hand, gives a stool of a uniform soupy consistence, greyish and granular throughout, with flakes or large quantities of mucus. There may be then no pain, or intense pain, with tenesmus.

Treatment.— While I have every confidence in the curative power of medicines chosen according to the law of similia, auxiliary measures are at times imperative. If the diarrhœa is caused by indi-

gestible or toxic substances in the intestines, our remedies will not control it until they pass away. Nature alone cannot always remove them. We should aid by colon-flushings, laxatives of a non-irritating nature, like olive oil, castor oil, magnesia, Epsom salts, or congress water. After the foreign, irritating, or fermenting substance is expelled, then the curative influence of medicine will promptly appear. We should also prohibit all solid or irritating food and drink, and give only such aliments as rice or barley water, arrow root, corn starch, or farina gruel, boiled milk and Vichy water equal parts, and demulcent beverages.

I recommend "Bell on Diarrhœa" and McMichael's "Therapeutics of the Digestive System," as the best works we possess whereby to select the remedy. Not that I believe that all the symptoms are trustworthy, for I do not. I know that many are not due to the drug under which they are placed, and many of them are due to the coloring matter, or odor of the drug; but for all that they are the best repertorial guides we now possess. In a work of this scope it is not expected that all the indicated medicines with their symptoms shall be given.

In addition to the strictly homeopathic remedies for diarrhœa there are other methods, uncertain, though often curative of a diarrhœa that has resisted the best selected proven medicines. Some of these belong to the class known to materia medica as "astringents." These agents have the power of contracting living tissues. When applied in moderate quantities to healthy mucous surfaces they contract the capillary blood-vessels and secretory glands, but if the dose is large, dilatation and relaxation follows. The text-books of the dominant school teach that astringents should not be used in congestion or inflammation of mucous surfaces, as they will aggravate, but that they are useful nevertheless in over-secretion with morbid discharges.

In my "New Remedies" (fourth edition) I discussed this subject when writing of geranium maculatum, and I then asserted a doctrine to which I still adhere, that astringents are primarily homeopathic to a mild form of congestion with dryness of mucous surfaces, a sub-acute inflammation; and are secondarily homeopathic to relaxation, *i. e.*, the condition in passive hemorrhages, passive diarrhœa, and other discharges due to this relaxation. We have provings of

very few genuine astringents; nitrate of silver, sulphuric acid, lead, alumen, bismuth, zinc, and copper among the minerals, but of no vegetable astringents of any note.

We find sulphuric acid, bismuth, zinc, and copper very useful in chronic diarrhœas. Tannic and gallic acid, of all astringents the most typical, are rarely useful in constipation or diarrhœa. This is a singular fact, while vegetable drugs which contain them are used successfully. I will not attempt to explain the parodox.

Geranium maculatum is a typical vegetable astringent, but it contains other medicinal principles that may modify its astringent action. It contains nearly thirty per cent of tannin, but the tannin alone will not cure what the whole drug will. The same can be said of catechu, kino, hæmytoxylon, rhatany, quercus, rhus glabra, blackberry root, rose leaves, and potentilla. Now I have found that in many atonic or passive diarrhœas these drugs act curatively, and in the most prompt and energetic manner. Geranium is the most efficient of all; a few drops of the tincture frequently repeated will cure chronic diarrhœa in a few days or weeks.

Rubus villosus (blackberry) and rubus canadensis (dewberry) have a world-wide popular reputation for the cure of atonic diarrhœa. Only the root should be used, as the berries have no value, and are positively harmful. The "blackberry cordials" made from the juice of the berries are abominable frauds and should never be used. A good tincture of the roots in ten to twenty drop doses, or one to four drachms of the simple syrup, is the best preparation. With this "blackberry syrup" I have cured atonic diarrhœas of children when all other medicines failed.

Potentilla, a wild fruitless species of the family Fragaria (strawberry), is nearly equal to blackberry in chronic colliquitive discharges from the bowels. The tincture or decoction of the leaves should be used. In Russia, England, and in this country the leaves of the raspberry are valued highly in the same disease.

All the roses possess the same properties. A recent Russian writer praises very highly an infusion of the red rose as being the most potent remedy in the chronic diarrhœa of children. One drachm of the leaves is steeped in one ounce of boiling water, and a teaspoonful of this is given every hour; I have found it useful in many cases. Some of the most obstinate cases I ever treated

were relieved by a few drops of tincture of kino three times a day. I can say the same of rhatany (krammeria), and hæmytoxylon (logwood).

There is another class of medicines rarely used in diarrhœa that act in a manner peculiar to themselves. Coffea, guarana, kola, and thea all contain tannin, and all an alkaloid similar to caffeine. In persons who do not use coffee, a few drops of the tincture, or a teaspoonful of a strong decoction will cure lientery — a diarrhœa of feculent undigested food. Guarana and kola will cure obstinate chronic cases in which the atony of the stomach and bowels is such that the food passes away partially digested. These two last medicines should never be lost sight of in chronic cases.

There was once sold a beverage called "acorn cocoa," made of equal parts of roasted acorns and cocoa; this used as a drink in atonic diarrhœas of children gave most excellent results. A beverage of roasted sweet acorns with cream and sugar is quite as palatable and equally curative.

Rhus glabra and rhus aromatica are both useful in chronic diarrhœa and dysentery after the acute stage has passed, and the discharges are kept up by atony of the mucous membranes and muscular tissue of the intestines. The dose is ten to fifteen drops of the tincture several times a day. Headland ("Action of Medicines") says all astringents primarily contract muscular tissues and secondarily relax them. There are some chronic diarrhœas which according to recent investigation appear to be caused, or continued, by certain ferments due to fungi or bacteria. They have their seat in the large bowel. The evacuations are foamy, frothy, sour, and horribly offensive. The treatment of such cases should be partially or wholly conducted by the use of antiseptic agents.

Among the most useful is naphthalin in doses of one-tenth of a grain to three grains, three times a day. It is especially useful when parasitic worms are present, or the bacillus typhosus.

Benzo-naphthol is equally useful when fungi or poisonous bacteria are present. The dose is a few grains of the 1x or 2x. The fœtor of the stools are soon removed by its use. Salol in doses the same as naphthalin, is often more efficient and curative than either of the above; salicylate of sodium often rivals salol, especially when bile is absent from the stools. Creosote has also been found of equal value.

DIARRHŒA OF CHILDREN.

Pathologists now divide this disorder into three forms: (1) acute dyspeptic diarrhœa; (2) cholera infantum; and (3) acute entero-colitis.

I propose to discuss each separately, as the treatment of each is distinct. Infantile diarrhœa occurs most frequently in children artificially fed. Of two thousand fatal cases only six were entirely breast-fed. It occurs between the ages of six and eighteen months. The relation of the temperature to the prevalence of diarrhœa is important. The mortality curve begins to rise in May, and reaches the maximum in July, and then gradually declines until the end of December. It is not much influenced by barometric pressure or humidity, but great heat and great humidity certainly increase the death-rate.

The relation of bacteria to infantile diarrhœa is also important. The bacillus lactis ærogenes is only present in the intestines after a milk diet, milk sugar appearing to furnish the materials necessary for its growth. It lives in the upper portion of the bowel, and excites the fermentive processes in milk. The bacterium coli commune is found mostly in the lower intestine, and influences certain phases of digestion. These are not toxic. Only the bacteria of the proteus group are pathogenic.

The morbid anatomy of these diarrhœas is as follows: There is catarrhal swelling of the mucosa of the large and small intestines, with enlargement of the lymph-follicles. In chronic cases these latter show small erosions or ulcers; more rarely a croupous inflammation affects the lower part of the ileum and colon. Brain lesions are rare, but the membranes and brain substance are often anæmic.

ACUTE DYSPEPTIC DIARRHŒA.

Symptoms.—The child, after being feverish and restless at night, has frequent stools containing undigested food and curds; these are very offensive; or vomiting, griping pains, and fever may suddenly occur, the temperature rising rapidly until it reaches 104° or 105°. There may be convulsions at the outset, or jerkings and twitchings at the slightest noise during sleep. The abdomen is sensitive; the child does not like to be moved, and lies with legs drawn up. The

stools consist of grayish or greenish yellow fœces mixed with curds, gas, and portions of food; they are rarely watery or serous. In children over two years of age these attacks follow the eating of unripe, or partially chewed food, or tainted milk. Under careful treatment this disturbance passes off in a few days, but relapses occur, or the attack may run into an entero-colitis.

Treatment.—All solid food must be withheld, even sterilized milk, and the child placed upon a diet of cool rice or barley water. Sometimes fresh milk and Vichy water, equal parts, may be given. If the attack has followed the use of undigestible food, it should be carried out of the bowels by enough magnesia, castor oil, or mercurius dulcis to have that effect. I prefer the milk of magnesia, or "Husband's magnesia." If the fever is high and the child is very nervous, aconite 1x and belladonna 2x should be given until the temperature is lowered. Chamomilla is sometimes better than belladonna for the extreme reflex erethism. Use ipecac 1x if the vomiting is persistent, or bismuth (five grains every hour) if ipecac does not arrest it in a few hours. Give iris 1x if there is sour vomiting, and sour diarrhœa of a pale lemon color with frequent small flatulent movements; and pulsatilla 3x if there is much mucus in the vomit and stools. Rheum 1x if the stools are feculent and sour.

Senna, castor oil, aloe, podophyllum, china, colocynth, dioscorea, and dulcamara are also appropriate. For indications, consult Bell on "Diarrhœa" or McMichael's "Repertory."

Many cases of this form will be attended by such severe convulsions that chloroform will have to be given to arrest them; or bromide of potassium or strontium every hour, one grain for each year of the child's age. Many prominent authorities now recommend irrigation of the stomach and bowels during the early stages to remove decomposing matters in the stomach and intestines. This method is doubtless of value, but it can with difficulty be introduced into private practice. In hospitals for children it can be practiced because there is no parental interference.

A large-sized soft rubber catheter is introduced into the stomach, and by means of a funnel, lukewarm water can be made to pass in and out until it becomes quite clear. Irrigation of the large bowel can be managed as follows: the child should be placed on the back with the hips elevated. A flexible catheter is pushed up six or eight

inches, and one or two pints of warm water allowed to flow in from a fountain syringe. I have not practiced irrigation of the stomach, but have irrigated the colon in several cases of horribly offensive diarrhœa, with excellent results. In one instance I added resorcin, one drachm, to a pint of glycerine and water. It brought away old fæcal masses and disinfected the intestine. Recovery rapidly followed. In several cases of obstinate entero-colitis (called dysentery) two drachms of paregoric in a pint of water thus injected effectually and safely arrested the disease.

The hygienic management and dietetic treatment of children suffering from chronic infantile diarrhœa is equally if not of more importance than the medicinal.

"The effect of a change from the hot stifling atmosphere of a town to the mountains or sea is often seen at once in a reduction in the number of stools and a rapid improvement in the physical condition. Even in the cities much may be done by sending the child into the parks, or for daily excursions on the water. However extreme the condition, fresh air is indicated. The child should not be too thickly clad. Many mothers, even in warm weather, clothe their children too heavily. Bathing is of value in infantile diarrhœa, and when the fever rises above 102° or 105° the child should be placed in a warm bath, the temperature of which may be gradually reduced, and by keeping the child in the bath for twenty minutes, the water will at the end of that time be sufficiently cooled. Much relief is obtained by the application of cold wet cloths, or in rare cases of unusual severity the ice-cap to the head. Irrigation of the colon with cold water is sometimes favorable, but it has not the advantage of the general bath, the beneficial effect of which is seen, not only in the reduction of the temperature, but in a general stimulation of the nervous system of the child." (Osler.)

Dietetic Treatment. — "In the case of a hand-fed child it is important, if possible, to get a wet nurse. While fever is present, digestion is sure to be much disturbed, and the amount of food should be restricted. If water or barley water be given, the child will not feel the deprivation of food so much. When the vomiting is incessant it is much better not to attempt to give milk or other articles of food, but to let the child take water whenever it will. In the dyspeptic diarrhœas of infants, practically the whole treatment is a

matter of artificial feeding, and there is no subject in medicine on which it is more difficult to lay down satisfactory rules. No doubt within a few years the study of the bacterial processes going on in the intestines of the child will give us most important suggestions. From his observations, Escherich lays down the following rules, recognizing two well-defined forms of intestinal fermentation, the acid and the alkaline. If there is much decomposition, with foul offensive stools, the albuminous articles should be withheld from the diet and the carbo-hydrates given, such as dextrin foods, sugar, and milk, which, on account of its sugar, ranks with the carbo-hydrates. If there is acid fermentation, with sour but not fœtid stools, an albuminous diet is given, such as broths and egg albumen. It is, however, by no means certain whether the reaction of the stools, upon which this author relies, is a sufficient test of the nature of the intestinal fermentation. In the dyspeptic diarrhœas of artificially-fed infants it is best, as a rule, to withhold milk, and to feed the child, for the time at least, on egg albumen, broths, and beef juices. To prepare the egg albumen, the whites of two or three eggs may be stirred into a pint of water, and a teaspoonful of brandy and a little salt mixed with it. The child will usually take this freely, and it is both stimulating and nourishing. It is sometimes remarkable with what rapidity a child that has been fed on artificial food and milk will pick up and improve on this diet alone. Beef juice is obtained by pressing with a lemon-squeezer fresh steak, previously minced, and either uncooked or slightly broiled. This may be given alternately with the egg albumen, or it may be given alone. Valentine's beef juice can be used when it is impossible to prepare the above.

Mutton or chicken broth will be found equally serviceable, but it is prepared with greater difficulty, and contains more fat. In the preparation, a pound of mutton, chicken, or beef, carefully freed from fat, is minced and placed in a pint of cold water and allowed to stand in a glass jar on ice for three or four hours. It should be cooked over a slow fire for at least three hours, then strained, allowed to cool, the fat skimmed off, sufficient salt added, and it may then be given either warm or cold. These naturally prepared albumen foods are very much to be preferred to the various artificial substances. There is no form of nourishment so readily assimilated,

and so little apt to cause disturbance, as egg albumen or the simple beef juices. The child should be fed every two hours, and in the intervals water may be freely given. It cannot be expected that, with the digestion seriously impaired, as much food can be taken as in health, and in many instances we see the diarrhœa aggravated by persistent overfeeding. When the child's stomach is quieted and the diarrhœa checked, there may be a gradual return to the milk diet. The milk should be sterilized, and in institutions and cities so simple a prophylactic measure is of the very first importance, and is readily carried out by means of the steam sterilizer. The milk should be at first freely diluted,— four parts of water to one of milk, which is perhaps the preferable way,— or it may be peptonized. The stools should be examined daily, as important indications may be obtained from them. Milk whey and fermented milk are sometimes useful, and may be employed when the stomach is very irritable.

In some instances "malted milk" will agree with the child better than any other food. It should be given at first very dilute, gradually adding more as the child improves. A mixture of one part pure cream to five parts water, or barley water, will be well borne when milk and barley water disagrees.

Sterilized milk is not always beneficial. The fashion of sterilizing milk by subjecting it to a temperature of 212° for twenty or thirty minutes, and advising it in all cases of illness, especially in children, has had its day. After an experience of six years with milk so prepared I join in the verdict of the more practical members of the profession that while milk thus sterilized is useful in some cases of gastro-intestinal disorders, it is often very unsatisfactory when used as a regular food. In fact, I have known many children lose weight constantly under its exclusive use.

CHOLERA INFANTUM.

This disease in the infant is similar to cholera morbus or choleraic diarrhœa in the adult. It is not so common as the form of infantile diarrhœa above mentioned; occurring only in two or three per cent of the cases of summer diarrhœa.

It prevails during hot weather and selects children artificially fed.

The main symptoms are uncontrollable vomiting, diarrhœa, and collapse. The vomiting is excited by any attempt to take food or drink. The stools are profuse and frequent; at first fæcal, brown, or yellow; finally thin, serous, and watery. Like the vomiting, the stools follow immediately the swallowing of any liquid or solid.

The first stools are very offensive, subsequently they are odorless. The thin, serous stools are alkaline; there is fever, but the thermometer should not be placed in the axilla, for the temperature there is three or four degrees below that of the rectum. The thirst is insatiable; the pulse rapid and feeble, and towards the end irregular and imperceptible. The eyes are sunken, the features pinched, the fontanelle depressed, and the skin is cold with a peculiar ashen hue. The tongue, coated at first, becomes red and dry. Death may occur within twenty-four hours, and with collapse there is very high internal temperature.

A singularly deceptive improvement sometimes occurs a few hours before the end; when the vomiting and purging cease, and the child lies quiet; but this apparent improvement is soon followed by coma or convulsions. In other cases the "hydrocephaloid state" described by Marshall Hall sets in, and imitates true hydrocephalus acutus.

When the brain is examined after death no change is observed except anæmia of the meninges and substance.

Dr. Osler believes this condition is probably caused by toxic agents absorbed from the intestine. No constant bacterial organism has been found, but Baginski considers the disease caused by the *product* of decomposition, brought about by various bacteria.

Some very curious notions have been held concerning the nature of cholera infantum. It has been supposed to be a cerebral disease from the first, and a few of our school have asserted that belladonna would cure all cases "if given high enough." This is of course too absurd to be considered for a moment. Its nature is similar to that of true cholera without the contagious comma bacillus.

Rational homeopathic treatment is far superior to that of any other school, yet the mortality under our treatment is fearful. There is no disease that requires such intelligent patient nursing, and such constant watching by the physician.

During the first stage, if we are called soon enough the best remedy is mercurius dulcis 1x; a grain every hour, alternated with aco-

nite 1x, if the rectal temperature is high, 103° to 105°. When the stools become watery and serous, and prostration sets in, arsenite of copper 2x is generally the best remedy. It is indicated by the intense thirst, great restlessness, violent vomiting, cramps, and tendency to convulsions. A tablet can be partially dissolved and placed on the tongue, and after a few minutes a spoonful of ice-water given. Give the child cold water or very hot water (I prefer the latter), as much as desired, even if it is vomited; but no food, liquid or solid, should be given until the dangerous symptoms subside.

Camphor is sometimes useful, as in Asiatic cholera, when there is from the first collapse with coldness and blueness of the skin; a drop of the 1x in a spoonful of ice-water every fifteen minutes. In milder cases I have seen good results from the monobromide of camphor 1x or 2x; a grain every half-hour.

Veratrum album is a potent remedy in many cases when its symptoms are present. It has not the anxiety of arsenic, but the thirst is more insatiable, and internal cramps more noticeable. The stools are more watery, like rice water, and more profuse. I prefer the 8x dilution frequently repeated. No drug produces a more complete picture of cholera infantum than ricinus communis (castor oil seeds), as pointed out in my "New Remedies." It has been used successfully by East Indian physicians in this disease, as well as in cholera asiatica — in the 6x dilution.

There are cases of a mixed type that call for iris versicolor, croton oil, gambogia, elaterium, gratiola, secale, and a few others. (See Bell on "Diarrhœa.") The use of any preparation of opium is highly reprehensible and always injurious. In the collapse, brandy in small doses may aid in bringing about reaction, but the hypodermic use of brandy and ether is cruel and the height of folly. Ice-cold champagne has been used with alleged benefit.

During convalescence great care must be exercised to avoid relapses or entero-colitis. The first food given should be teaspoonful doses of egg albumen or any suitable beef juice, and ten to fifteen drops of this in a spoonful of cold water is often retained better than any other food. Milk should not be given for several days, and must be thoroughly shaken, peptonized, or mixed with arrow-root gruel, rice water, or barley water, equal parts. Later, a teaspoonful of finely scraped raw meat is often well borne.

APPENDICITIS — (Typhlitis, Perityphlitis, Paratyphlitis).

This is one of the most important of all intestinal affections. Osler says, "The use of the last two terms should be altogether discarded." Robson says, "All the forms of inflammation occurring in the neighborhood of the cæcum should be discussed under the name of appendicitis." Both authorities teach that inflammation of the vermiform appendix is the cause of ninety per cent of all cases of this form of peritonitis.

Osler divides the disease as follows:

Typhlitis, inflammation of the cæcum proper, is a doubtful and uncertain malady, the pathology of which is unknown, but which clinically is still recognized by authorities. A majority of the cases are unquestionably due to appendix disease.

Appendicitis is: (1) catarrhal, (2) ulcerative, (3) perforative, with production of abscesses, which may be pericæcal, pelvic, intraperitoneal, perinephritic or lumbar, depending on the situation of the vermiform process.

Robson classifies as follows: (1) appendicitis without suppuration, depending on ulceration or catarrh, and producing local peritonitis, which has a tendency to resolution but which is liable to recur; (2) perforating appendicitis, ending in suppuration, and producing either a local abscess or diffuse peritonitis.

Typhlitis.— This disease is usually met with in young persons, in boys more commonly than girls; the subjects have probably been constipated, and there have been errors in diet, or a resort to such purgative medicines as rhubarb, which leaves obstinate constipation as a secondary effect. The patient complains of pain in the right iliac fossa, and sometimes following the course of the colon. In children, according to Eustace Smith, it occurs between the ages of four and twelve. (The disease described by Smith in "Diseases of Children" as perityphlitis, is described by Osler and others as appendicitis.) There is generally constipation, but in two of my cases the disease commenced with a diarrhœa. Vomiting of watery and bilious matter, or severe and distressing retching, may attend it. The temperature marks 101° or 102°. There is fullness in the right iliac fossa, the patient lies on the back, generally with the right thigh flexed, and any attempt to straighten it causes pain. On pressure

there is tenderness, and in many instances a doughy, sausage-shaped swelling is found in the right flank. Percussion over this swelling yields a dull sound.

In children these attacks are doubtless mistaken for "colic," but if the thermometer is placed in the rectum, and records 100° to 102°, typhlitis is present. The disease lasts from three to ten days, but is liable to recur from any error in diet, or if the bowels become constipated.

Few writers mention any bladder complication, but in several of my cases the dysuria was terrible; in others retention of urine occurred, necessitating a frequent use of the catheter. I have observed in several instances a recurrence of the attacks at the same time every year, usually in the winter. Many after recovery have attacks of pain in the cæcum, lasting a day or two but unattended by swelling, the pain probably being due to incarcerated flatus in that region.

Among the sequelæ of typhlitis are continued tenderness of the iliac region and sciatica. No author whom I have consulted mentions the latter, but I have observed it in several cases, one of which was my own. At the age of eighteen I became constipated, and to relieve it took every night for weeks a few grains of rhubarb root, which I had to increase continually. Being ignorant of its secondary effects, its use was continued until hard fæcal masses accumulated in the cæcum. I was attacked with typhlitis, then called inflammation of the bowels. I was very ill for several weeks. The swelling of the cæcum did not disappear for some time after I was able to sit up. During convalescence a severe right sciatica occurred which has followed me through life, gradually growing less severe since the age of sixty.

Treatment.— Cowperthwaite, in Arndt's "System of Medicine," recommends belladonna, bryonia, hepar sulph., mercurius, and rhus tox. Lilienthal in addition recommends opium, plumbum, lachesis, and others. My experience convinces me that of all these, only belladonna and mercurius are of any value. The symptoms given under bryonia and rhus are rheumatic and have no relation to typhlitis.

Opium and plumbum may be of use in the old "typhlitis stercoralis," but not for the disease now under consideration.

When I am sure I have a case of typhlitis I give belladonna 1x

or the tincture twenty drops in four ounces of water, a teaspoonful every half-hour. After twelve hours I give mercurius dulcis 2x (five grains), in alternation with belladonna, two or four hours apart, all through the disease, or until decided improvement sets in. For the relief of the severe pain dioscorea tincture, ten drops every half-hour, is better than any other drug. Colocynth is not often indicated. If any anodyne must be used, codeine is to be preferred to any other preparation from opium, as it does not constipate or derange the stomach. Give one-third to one-half of a grain, hypodermatically or by the mouth, every two or four hours if necessary. When there is a large swelling in the iliac region I give phytolacca in place of belladonna. I have always used hot applications, generally a poultice of flaxseed meal with a little turpentine and aconite or opium in it. Like Cowperthwaite I have not found ice bags agreeable to the patient, nor has it given the relief which Bartholow or Osler claims for it.

In the beginning I order an enema of warm water thrown into the colon by means of a long flexible rectal tube, two quarts for an adult, and one pint for a child. Instead of soap I prefer glycerine, adding an ounce to each pint of fluid. I have found that these enemata soften and dissolve the fæcal accumulations. They should be used twice a day until the colon is empty clear to the cæcal valve. I believe the disease can thus be greatly shortened and deprived of its danger.

In this disease it is important that the colon should be rendered antiseptic. No other drug than salol accomplishes this so thoroughly. Three or five grains in pill or capsule can be given every six hours. It not only acts as an antiseptic but has I believe a curative influence over the inflammation. It reaches the colon before it is dissolved, and acts on the mucous surfaces as an anodyne.

Appendicitis. — As before remarked the concensus of present medical opinion is that inflammation of the appendix vermiformis is at the bottom of nearly all the diseases known as typhlitis and peri-typhlitis.

For a proper understanding of appendicitis and its symptoms, the anatomical relations should be considered, else we shall be at a loss to account for the concomitant symptoms. As Osler gives the clearest statement I quote his observations:

"The appendix vermiformis is extremely variable in position. It commonly lies behind the ileum with the tip pointing toward the spleen. It is frequently turned up behind the cæcum, or it lies upon the psoas muscle with its tip at the margin of the pelvis. It has, however, been found in almost every region of the abdomen. Thus in my post-mortem notes it is stated to have been found in close contact with the bladder; adherent to the ovary or broad ligament; in the central position of the abdomen, close to the navel; in contact with the gall-bladder; passing out at right angles and adherent to the sigmoid flexure to the left of the middle line of the abdomen; and in one case it passed with the cæcum into the inguinal canal, curved upon itself, re-entered the abdomen, and was adherent to the wall of an abscess cavity just to the right of the promontory of the sacrum.

"Foreign bodies rarely lodge in it. Only two instances have come under my notice; in one there were eight snipe-shot, and in the other five apple pips. On the other hand, oval bodies resembling date-stones are very common. They consist of inspissated mucus and fæces, in which in time, lime salts are deposited, forming enteroliths.

"Post-mortem examinations show that the appendix is very frequently the seat of extensive disease, past or present, without the history of any definite symptoms pointing to trouble in the cæcal region. Among the commonest of these conditions is obliteration, either total or partial. When at the cæcal end, the appendix may be enormously dilated, forming a tumor the size of the thumb or as large as a sausage. In the case of obliteration the appendix may be free; more commonly it is adherent, and there may be about it signs of old inflammation, or even a small encapsulated abscess, which has given no trouble."

Etiology.—Appendicitis is a disease of young persons. According to Fitz's statistics, more than fifty per cent of the cases occur before the twentieth year; sixty per cent between the sixteenth and thirtieth years. It has been met with as early as the seventh week, but it is rarely seen prior to the third year. It is very much more common in males than in females, eighty per cent, according to the tables of Fitz, but in his personal experience in seventy-two cases males were only twice as frequently affected as females. Contrary to the general experience, the Munich figures (Einhorn) indicate

a relatively greater number of women attacked. The fæcal concretions and foreign bodies already referred to probably play the most important role in the etiology of the disease. In a series of 152 cases the fæcal masses were present in forty-seven per cent and foreign bodies in twelve per cent. Matterstock, in 169 cases of perforative appendicitis, found the percentage to be fifty-three and twelve, respectively. Typhoid fever and tuberculosis frequently induce ulceration of the appendix, but not often perforation. Fitz suggests that some of the cases of peritonitis which recover in typhoid fever are due to the perforation of the appendix. Traumatism plays a very definite role, and in a number of cases the symptoms have followed the lifting of a heavy weight, or a fall, or a blow. Constipation, overloading the stomach with indigestible food, indiscretions in diet, are mentioned in many cases. The tendency of the disease to recur is remarkable. Among 257 cases (Fitz) eleven per cent had had previous attacks. In the recurring appendicitis, no factor is of greater importance than overeating, and attacks may follow directly upon the taking of large quantities of unsuitable food.

Modern authorities recognize two forms of this disease. (1) Catarrhal inflammation, in which the entire tube is thickened, the peritoneal surface injected and perhaps adhesions formed, showing that there has been slight peritonitis. The mucous lining is thickened and covered with tenacious mucus, and very commonly fæcal concretions and small enteroliths are present. All the coats are thickened, especially the muscular, and the entire tube may be firm and stiff. It may attain the size of the index finger or thumb. When opened it rolls outwardly, showing the interior surfaces. (2) Perforation and ulceration. Dangerous ulcers are caused by the irritation of fæcal concretions or foreign bodies, such as seeds, stones, and hulls of grain. Typhoid fever and tuberculosis may cause ulceration.

Perforation may arise from obliteration of the cæcal end, distending the lumen with fluid. When perforation occurs it may at once excite violent and diffuse suppurative peritonitis, but more commonly adhesion takes place and a local peritonitis results.

When abscesses occur they may be located at various places, most commonly on the psoas muscle near the terminal portion of the ileum. It may be within the pelvis close to the ileum, or between the ileum and sacrum. In some cases a large circumscribed abscess

forms in the iliac region and points midway between the umbilicus and the anterior superior spine of the ilium. Wherever the abscess locates it excites severe peritonitis, even if the abscess does not rupture.

When the appendix is not within the peritoneum, perforation produces a retroperitoneal abscess, and the pus may burrow and appear at Poupart's ligament, discharging outwardly, and recovery may follow. The pus may form a large perinephritic abscess, and perforate the diaphragm and pleura. It may extend along the psoas muscles and perforate the hip joint, or pass along the rectum, producing abscesses in the scrotum, or form a gluteal abscess. It may perforate the bladder or bowel, and be discharged through the rectum. It may burst into the veins, causing septicæmia; or into an artery, producing dangerous hemorrhages. Many "psoas abscesses" are probably nearly due to disease of the appendix, and unless there is unmistakable evidence of Pott's disease of the vertebræ such must be the origin.

The symptoms of appendicitis are mainly of circumscribed peritonitis in the right iliac region, and such as were mentioned under typhlitis.

Catarrhal appendicitis may occur without ulceration or perforation. This form is not usually attended by constipation, in fact a diarrhœa may be present from the beginning. Resolution may take place without severe symptoms, but the attacks recur from time to time.

Perforative appendicitis is a much more serious affair. The most unmistakable symptom is a sudden violent pain in the abdomen, usually in the right iliac fossa. It occurs in eighty-four per cent of all cases. This sudden, excruciating pain is not always confined to the fossa, but may extend to the navel, perineum, testicle, or thigh. An initial chill is rare, but fever, furred tongue, and vomiting may precede or accompany the pain. The temperature ranges from 101° to 103° or higher. The patient in walking bends over towards the right side, and cannot stand erect without pain. He lies on the back with the right leg drawn up, and cannot extend it without suffering. There may be fever, dysuria, or retention of urine. In children diarrhœa is more frequent than in adults.

In some cases tympanites appears early; in others the abdomen

may be hard, flat, and rigid as a board, even when there is diffuse peritonitis. The tenderness is generally located in the region of the appendix. A valuable diagnostic sign, first pointed out by McBurney, is "a point of tenderness on deep pressure situated from one and a half to two inches from the anterior superior spine of the ileum, on a line drawn from this point to the navel." In several instances I had observed this symptom before I saw McBurney's observation. Deep pressure causes agonizing pain at this point. The location of the swelling is various. It is sometimes an inch or two above Poupart's ligament; it may be a diffuse thickening and induration covering considerable space, or a well-defined tumor-like mass may be felt. If the abscess is large, fluctuation may be felt above Poupart's ligament or in the flank, but it can rarely be detected, because it is masked by the distended intestines. In two cases I have felt fluctuation in the rectum.

Appendicitis may be mistaken for intussusception, strangulation, or obstruction of the bowel. In women diseases of the tubes and pelvic peritonitis may simulate it.

Appendicitis is one of the most serious and fatal of the abdominal diseases, yet post-mortem observations show that many cases recover, often without treatment. Recurrences are common, over forty per cent; sixty-eight per cent of the fatal cases die during the first eight days. If the inflammation extends to the whole peritoneum it is almost always fatal. Perforation externally is generally followed by recovery; if into the bowel it is more serious.

Treatment.— The same medicines and local applications recommended as for typhlitis. Absolute rest is essential; the patient should not be allowed to stand, walk, or turn over in bed. The urine should be drawn by a catheter unless a bed-pan or urinal can be used, and a bed-pan should always be used to receive the evacuations from the bowels.

Saline laxatives have been recommended, but Osler protests against their use, "because they have been advocated under a total misapprehension." They cannot benefit this disease, although they may be of benefit in typhlitis, but as it is rarely possible to make a diagnosis of the latter from appendicitis, it is best not to use them at all. In pelvic peritonitis and inflammation of the tubes, saline laxatives are useful, but we should be sure of our diagnosis.

Our school generally condemns opium in peritonitis and other inflammatory diseases of the bowels, but I am sure the condemnation should not extend to the disease under consideration. After we have unloaded the bowel with an enema, and as no solid food is given to produce fæcal accumulation, opium can do no harm, and will keep the abdominal contents in a state of rest, a most desirable and necessary effect. I do not recommend opium in pill, or laudanum, but McMunn's elixir, or the deodorized tincture. They can be given in enema or by the mouth, and they rarely derange the stomach. I prefer phosphate of codeine by hypodermic injection, but it can be given in other ways. The combination of morphine and atropine is better in some cases. I have never used the ice-bags, preferring the poultice mentioned under typhlitis, and as I have never lost a case, or had one operated upon, I see no need of changing my practice. Without wishing to appear egotistical, I may be allowed to state that I have taken several cases after the surgeons had decided for an operation, and they have all recovered without it. This does not prevent me from advising an operation under the following conditions: (1) When there is, in an acute attack, tympanites, increase of fever with very rapid pulse, and when the pain is rapidly spreading, indicating general peritonitis. (Osler says, "even if no tumor is present.") (2) In recurrent appendicitis, when a tumor is present,—it may partially disappear, but never be wholly absent, and when the frequency of the attacks and the continual local tenderness unfit the patient for his usual occupations. That such cases do often ultimately recover is undisputed. On the other hand, perforation may occur at any time. The opinion of the best surgeons is that the operation should not be performed in the interim between the attacks, but if the recurrence is attended by the appearance of grave symptoms, operate at once. It is always best for the physician to call in consultation, in grave cases, some well-known conservative surgeon. I recall three typical cases which illustrate the policy of conservatism. One was the case of Mr. K., of Chicago. During the second week of his illness an eminent surgeon was called in consultation. He advised an operation if there was no improvement within twenty-four hours. The improvement did not appear for several days, but the family would not consent to an operation. When improvement did occur it was slow and tedious, and during the next

thirty days there were several recurrent but slight attacks. The tumor still remained, but constantly and slowly decreased in size. He then removed to New York City, when I placed him under the care of Dr. William Todd Helmuth. There he had several attacks, and at one time that eminent surgeon decided to operate, but deferred it owing to symptoms of improvement. This patient finally recovered so entirely that for years he has had no trace of the malady.

The other two cases were similar. An operation had been pronounced necessary by two of the best surgeons of Chicago. The patients were placed under my care. I treated them under protest, giving an opinion that they might recover, but promising nothing positive. All these patients were given phytolacca, salol, and turpentine internally. An ointment of ichthyol and phytolacca was applied to the iliac region; they were fed on buttermilk, beef broth, mutton broth, and milk-gruels. One of the patients was so emaciated that I prescribed morrhual, two grains every six hours, with the most excellent result of increasing food assimilation.

MEMBRANEOUS COLITIS.

This is a peculiar croupous inflammation of the colon. It has been described by Wood ("Practice of Medicine"), by Woodward (Vol. II., "Medical and Surgical Reports of the Civil War"), and by Dr. W. A. Edwards and Sir Andrew Clark. Eighty of the recorded adult cases have been in women. It is more frequent in this country than in England. I have seen several undoubted cases, and all but one were cured by homeopathic remedies. Osler says that he has twice seen the membrane in situ. "It was closely adherent to the mucosa of the colon, but capable of separation without any lesion of the surface. The cases are most invariably seen in nervous or hysterical women or neuræsthenic men. All grades of the affection occur, from the passage of slimy mucus like frog spawn to tubular casts a foot or more in length. These casts are not fibrinous but mucoid, and even the firmest consist of dense, opaque, transformed mucus. It is due to some derangement of the mucous glands of the colon, the nature of which is quite unknown." I do not think it much different from a peculiar form of catarrhal colitis.

The disease persists for years, and it is characterized by par-

oxysms, at irregular intervals, of severe pain in the bowels, tenderness of the abdomen, tenesmus, and the passage of flakes or long strings of mucus, or casts of the bowels. The attacks may last from one day to two weeks. Mental emotions or worry seems to bring on an attack. Membranes are not passed with every paroxysm. One of my severest cases occurred during a painful pregnancy.

Symptoms similar to those of membraneous colitis have been caused by nitrate of silver, muriate of ammonia, colchicum, cuprum, nitric acid, veratrum album, asarum, sulphuric acid, and cantharides.

Treatment.—All the above mentioned drugs said to have caused a similiar condition are indicated in special cases. The symptoms and their concomitants are recorded in Bell on "Diarrhœa."

One of my cases was cured by asarum europeum, five drops of the tincture four times a day. The paroxysms were characterized by tormina, followed by tenesmus, chills, threatening of miscarriage (in a woman four months pregnant), and a discharge of long ropes of yellow, shaggy, membraneous mucus.

A German authority reports that after giving euonymin, one-fourth of a grain three times a day, discharges of membraneous casts and masses followed. In a chronic case under my care, the administration of two or three grains of euonymin 2x was followed by the expulsion of membraneous casts, with less than the usual pain. There has since been no recurrence. I have cured cases by means of colchicum 3x when the paroxysm of pain was followed by membraneous flakes.

Hydrastis and its alkaloids are all indicated in this disease. It has been found that when hydrastis is applied to mucous surfaces it first causes an increased flow of normal mucus; at the same time it stimulates the follicular glands to an increased secretion. If the drug be constantly applied, the secretions become yellow, thick, tenacious, and ropy. It may become so firm as to simulate a membraneous structure. Here we have a drug capable of causing a condition similar to membraneous colitis.

In two cases where other medicines failed to arrest the formation, hydrastin was given in one-grain sugar-coated pills four times a day. The patient had only two light attacks afterwards. I once gave hydrastis 1x, ten drops four times a day, with no perceptible results.

The failure may be explained in this manner: I have observed

that if hydrastin is to exercise its curative influence over catarrhal affections, it must be brought into direct contact with the affected surface. The pills were probably not entirely dissolved until they reached the colon, while the 1x tincture became lost or so mingled with the intestinal contents that it failed to come in contact with the diseased surface. There is now a method of so coating pills that they are insoluble in the acids of the stomach, but soluble in the alkaline fluids of the intestines. Such a coating should be applied to hydrastis when we desire to affect the colon.

Muriate of ammonia has an influence on mucous surfaces similar to hydrastis, and will doubtless be found a remedy for this disease; being an alkali it will pass through the stomach unchanged and act on the large bowel. The symptom—"discharge of glairy tough mucus with stool"—clearly indicates it.

There may be cases requiring iodide of mercury, bichromate of potassium, capsicum, nitric acid, and perhaps croton oil.

To relieve the paroxysms of pain occurring during the expulsion of the membraneous secretion adherent to the colon, dioscorea, *colocynth*, and hyoscyamus are useful. Very severe pain may need hypodermic injections of phosphate of codeine, or it may be given by the mouth, or in enema, in doses of one-fourth to one-half of a grain.

CONSTIPATION.

In a normal condition, every person is supposed to have one healthy evacuation from the bowels every day. It matters not at what time this evacuation occurs, morning, noon, or night,—but in the morning after breakfast is the usual time. Yet many persons who seem healthy have a movement of the bowels twice or three times a day, generally after meals; in such cases, if the stool be normal and without pain, the condition cannot be considered abnormal. Many persons who seem in perfect health have their bowels relieved every two, three, or seven days, or even every two or three weeks; cases are not rare in which some degree of good health has been maintained for many years, although fæcal evacuations have, during that time, occurred only at intervals of six weeks or two months. In most cases, however, retention beyond the usual period is apt to

produce not only local uneasiness, such as tendency to piles and flatulence, but also some degree of general disturbance indicated by foul breath, loss of appetite, and dyspeptic symptoms. There is one form of constipation apt to be mistaken for looseness: the person may have several watery evacuations a day, yet an examination of the abdomen shows that the colon, and rectum even, is full of irregular masses of impacted fæces, that cause an irritation with watery stools, while the hard masses are retained in the folds of the large intestine.

Habitual constipation leads to more or less permanent hypertrophy and dilatation of the rectum, rendering this tube less efficient for the performance of its expulsive duties. The whole of the large intestine may become dilated by its contents, and hypertrophied, the mucous surface may be fretted into ulcers, and perforation may ensue; the dilatation may be so great that the colon measures twelve inches in circumference; this dilatation is greatest in the rectum, sigmoid flexure, and cæcum.

When not mechanical, constipation arises temporarily from change of diet, scene, or habit, or from anything that interferes with the regular performance of defecation. Riding on railway cars is a common cause, as is a change from active to sedentary habits. It is a symptom of chlorosis and diabetes, and is caused also by a dread of defecation, owing to pain at the anus from piles or fissure.

The purely mechanical causes are: cicatricial stricture, thickening of the walls of the rectum, compression from without by tumors, or traction of the bowels from their normal position by adhesion, tortion, strangulation, invagination, and finally from the impaction of foreign bodies. But these are conditions for the surgeon, and do not come within the scope of this article. One of the chief causes of constipation, and one leading to the worst consequences if not attended to, is inaction of the liver. I mean partial or complete arrest of the normal flow of bile into the intestines. Bile is the natural aperient of the human body; if too much is poured out there is bilious diarrhœa; if too little, sluggish action. The liver is the crematory of the system, where the poisons generated by the processes of elimination are burned and destroyed. Of these poisons, the most deleterious are the ptomaines that are formed in the intestines; if these are not burned, or carried out of the body, they are absorbed, and

cause a host of symptoms indicating poisoning of the brain, nervous system, and glandular organs.

Next to the general blood-poisoning, the injurious effect of constipation on the heart, is the most important. The poisonous ptomaines affect the heart as do digitaline, muscarine, veratrine, and other heart poisons. Many of the cases of cardiac disorder which we are called upon to treat are due to constipation, and its resultant ptomaine poisoning, aggravated by the mechanical irritation and pressure of an overloaded colon.

The treatment of chronic constipation should be more dietetic and hygienic than medicinal; the following rules, if faithfully carried out, will cure nearly all cases not due to mechanical obstruction. (1) Take three simple but liberal meals daily; a small cup of coffee at breakfast if its use has been habitual, and at lunch, tea, steeped not over five minutes. Avoid pickles, spices, curries, salted or preserved provisions, pies, pastry, cheese, jams, dried fruits, nuts, and all coarse, hard, indigestible food, taken with a view to move the bowels. This eating of coarse, cracked wheat, oatmeal bran, graham bread, and other grains *prepared with the hulls on*, is as reprehensible as is the taking of cathartics; they act by irritating the coats of the bowels just as cathartics do, and are as injurious in the end. All cereal grains and leguminous seeds can be prepared, divested of their indigestible envelope, and are much more palatable and nutritious. The various "Health-Food Companies" are doing good work in introducing such preparations. (2) On first waking in the morning, and also on going to bed at night, sip slowly, a quarter or half a pint of water, hot or cold; it is more than probable that one of the causes of constipation is the small quantity of water taken into the stomach by many persons. (3) On rising, take a cool or tepid sponge bath, rubbing the bowels thoroughly, giving a general friction with the towel afterwards. (4) Clothe warmly and loosely, see that there is no constriction around the waist just over the hips. (5) Walk at least half an hour three times daily. (6) Avoid sitting and working long in such a position as to compress or constrict the bowels. (7) Solicit the action of the bowels every day after breakfast (in some cases when there are piles, fissure, or proctalgia after stool, it is better to solicit the action of the bowels at night just before going to bed); if relief is not gained the first day, wait until the following day, then

renew the effort at the same time, but without straining; percussion of the anal orifice with the fingers will aid better than straining. Continue these daily efforts until the fourth day, when, if no result appears, an enema or laxative should be taken to unload the rectum and colon, when the daily effort should be resumed. The enema should not be large, not over half a pint, or a pint, unless there be impacted fæces high up in the cæcal region, when "colon-flushing" with warm water and olive oil or glycerine may be necessary; but to empty the rectum, a teacupful of soap and water, or glycerine and water, or even a tablespoonful of each, will act promptly. Glycerine suppositories act just as well and quickly as enemata; a little boric acid placed just inside the sphincter by means of a powder-blower or the finger, is often quickly followed by a stool.

Before having recourse to laxative drugs, try massage; on rising in the morning rub the bowels from right to left along the course of the colon with the palm of the hand oiled, or employ a masseur; I have known many most intractable cases cured in a few weeks through this method applied by one who understood the proper manipulations.

There are certain kinds of food that are directly beneficial in constipation, namely: pearled and granulated oats; pearled and granulated wheat; bread made of pearled wheat flour, which contains all the gluten and starch without the hulls; gluten flour; ginger-bread (in some cases better without ginger); mush or gems made from wheatena or "wheat germs"; granola; baked sweet apples; bananas, figs, prunes, dates, peaches, grape-fruit, oranges; baked beans and peas, sliced tomatoes, veal and lamb, tender steak and mutton chop, bacon and butter. Crackers, boiled milk, fine wheat flour, arrow root, cheese, pears, and preserved fruits,—all aggravate constipation.

We will suppose that for a week or two the patient has been under the above diet and regime with no satisfactory stool; the colon is found impacted and distended with fæcal matter; large enemata are of no avail; we have given several of the most approved homeopathic remedies without effect; what shall we do? We must not resort to active purgation, for it will only make a bad matter worse, but we can select a medicine that will, by its mild physiological action, imitate the natural functions of the bowels, and even increase them. One of these is hydrastis. Five to ten drops of the tincture taken before meals, by increasing the mucus in the colon (which in consti-

pation is deficient), and by stimulating the muscles of the intestines to increased peristaltic action, will generally enable the colon, in a few days, to get rid of its contents.

The next is nux vomica; one or two drops after meals, acting on the muscular fibres of the distended colon, will often in a day or two give them strength to expel the accumulated fæcal matter. Collinsonia is often more effectual than nux, in doses of five to ten drops.

Of all laxatives aloin gives the best satisfaction. One-tenth of a grain (granule) taken before supper and at 9 P. M. will generally give a natural stool the next morning. If the colon is distended by an accumulation, a larger quantity of aloin may be required. One-half a grain will remove the most obstinate impaction if no organic obstruction exists. After the contents of the colon have been evacuated, continue the same regimen recommended above. Aloin acts by increasing mucus, stimulating the expulsive muscles to action, and by exciting the torpid circulation in the blood-vessels of the intestines.

At one time in common with most physicians, I feared that aloin would cause piles and irritation of the rectum, but I am now satisfied that its careful use for a long period of time will not do so. I have given aloin to pregnant women for a constipation that would not yield to anything else, for six or eight months,—one-fifth to one-fourth of a grain every night or second night, without causing a single symptom of hemorrhoidal trouble. There are various combinations of aloin with other medicines, which sometimes act better than aloin alone; it is combined with podophyllin, with belladonna and strychnine, with nux and hydrastin, and with ipecac. Each has its advocates, and each acts well in certain persons.

Cascara sagrada has been widely advertised and used very extensively, but I have never been satisfied with its effects; it seems to me to act like crude aloe or podophyllum.

There are cases that, owing to neglect, and the serious symptoms of the head and heart, need very prompt and immediate relief. There has not been an evacuation of any amount for a week, the abdomen is distended, there is a sense of great weight in the left hypochondrium, the breathing is oppressed, the heart-beat is slow, feeble, or irregular, the headache is intense, the head feels full, heavy, and confused, there is vertigo, the patient is gloomy, cross, and nervous; perhaps no conveniences for giving an enema are at hand; in such

cases there is no drug that can compare with castor oil for promptness and thoroughness of action. One, two, or even four ounces can be given without danger; in emergencies there is no drug so safe; it acts best when given in strong, black coffee.

In addition to the dietetic and hygienic rules laid down above, we can do a great deal with medicines selected according to the law of similia; this requires good diagnostic skill, for we must know not only the pathological condition present in the patient, but also the pathological capabilities of the medicine. I will give two illustrations: The patient is an indolent man who eats a great deal and takes but little exercise; he goes out to stool only when he is obliged to; he has frequent inclination, but a trial is ineffectual; he has a dull headache, a coated tongue, is morose and irritable; his abdomen is distended and his food digests slowly; there is abdominal congestion and torpor of the intestinal muscles. Two remedies meet this condition: opium and nux vomica. Opium causes such a constipation primarily, nux, secondarily. If we give opium it should be prescribed in minute doses, *i. e.*, the 3d dilution, because, if indicated primarily, the dose must be small. Opium will often cure such cases if you change the patient's habits. Nux is not primarily indicated in such a case because its primary action is to cause frequent stools, with irregular evacuations, at times knotty, at times thin and small, often with ineffectual urging, since the muscles of the colon are irregular and spasmodic in action, but not paretic. Now, if you give the 1x for these primary symptoms you will aggravate the condition, but if you give the 3x you will cure. The first case above narrated, which simulates the primary action of opium, also simulates the secondary effects of nux, namely, intestinal torpor with passive congestion of the portal system. Here the 1x of nux will remove the constipation in a few days. Each case and each medicine must be studied in this manner if we are to be successful. Every medicine known to Materia Medica will cause constipation by its primary or secondary action. What a vast number we have to choose from, yet how few of these are ever used in actual practice! It is the rare cases that require rare remedies. I will mention but a few drugs that I have found most useful.

Bryonia is secondarily homeopathic to constipation; it is primarily a hydrogogue cathartic. If the constipation has been preceded by

profuse diarrhœa, it will cure in a low attenuation. Its congeries are podophyllin, rheum, colocynth, veratrum album, sulphur, hydrastis, and mercurius; all of these I use in low attenuations. Lycopodium, aluminum, and plumbum, like opium, cause extreme constipation primarily; they act best when administered in the 3x or 6x. Æsculus, graphites, natrum muriaticum, silica, and sepia, are useful in exceptional cases.

I do not include in the above those cases in which a deficiency of bile is the cause of the constipation; there are many such, and in nearly all, this deficiency has something to do with the trouble. In any case of constipation, if we discover that the skin is yellow or muddy, if the tongue is brown or yellow, if the stools are black or too pale, and the urine is loaded with uric acid, some medicine should be given that will arouse the bile secreting and excreting action of the liver. Pure bile itself will do this, for it is nature's laxative; one or two grains of inspissated ox-gall taken before each meal is often the only remedy needed. Euonymin excites the secretion and excretion of bile, and causes but slight laxative effect; a tablet of euonymin 1x (one-tenth of a grain), before each meal and at night, is very efficient. Iridin 1x, mercurius dulcis 1x, chionanthus 1x, chelidonium five drops, or carduus five drops, of the tincture, given in the same manner, will cure constipation with deficiency of bile, or greatly aid the action of remedies given for other conditions.

INTESTINAL OBSTRUCTION.

These obstructions may be caused by (1) fæcal accumulation, (2) tumors, (3) strictures, (4) intussusception, (5) strangulation, (6) twists, (7) knots, (8) concretions, and (9) foreign substances. These obstructions are nearly if not all in the province of the surgeon, but some mention may not be amiss in a work on practice.

(1) Fæcal accumulations have been mentioned under the head of constipation, but there are instances in which the patient has had daily alvine evacuations, while the fæcal matter has been slowly accumulating in a hernia or protrusion of the colon; or the patient has had insufficient stools for some time; the stools have been small, composed of hard scybalous masses, mixed with mucus. Sometimes the fæcal masses are channelled by the contents of the upper bowel,

and liquid stools may occur. An examination of the colon will show hard, irregular masses, which if not removed accumulate by accretion until the bowel is blocked up. Then the patient has headache, vomiting, abdominal distension, with fever and symptoms of ptomaine poisoning. (It might be properly called sewer-gas poisoning.) Colitis or peritonitis may result from the obstruction. Occasionally a spontaneous expulsion of enormous quantities of hard fæcal matter may occur, leaving the patient quite well. I know of several persons of both sexes who allow almost complete obstruction to occur from chronic constipation. When the bowels become painfully distended they devote two or three days to the task of clearing out the bowels by means of an enema and pills of hyoscyamus and aloe. They are quite ill during the operation, but when the obstruction is removed, return to business until the obstruction occurs in a few weeks. Some such cases I have cured by the continuous use of strychnia 100th of a grain three times a day, or plumbum 6x given in the same manner. Two of the most obstinate cases I ever knew were cured by abdominal massage given every day for a month.

(2) Tumors are to be treated by the surgeon when they are so large as to be a permanent obstruction. If small and movable, massage will be of benefit, and hydrastis may be useful in some cases.

(3) Strictures, if organic, require surgical interference, but there are instances of spasmodic stricture, which, if they can be diagnosed as such, can be removed by nux vomica, belladonna, gelsemium, or cocculus.

(4) Intussusception or invagination can sometimes be treated successfully by other than surgical means. The late Dr. Danforth reported several cases in which the invagination gave way to the injection of an effervescing mixture. A case was once reported where a quantity of bicarbonate of soda was thrown into the colon, followed by an injection of tartaric acid. The great distension of the bowel dislodged the invaginated intestine. Dr. Senn recommends the insufflation of hydrogen gas, which acts in the same manner. Purgatives should never be given; they have caused fatal results in many cases. They can only increase the obstruction.

Kussmaul recommends washing out the stomach. He claims that the abdominal distension is relieved, the pressure in the bowels above the seat of obstruction lessened, and the violent peristalsis

diminished. It should be done three or four times a day, and has proved a beneficial aid to other measures; in some cases it has cured. Flushing the bowel, filling the colon to extreme distension, even with warm water alone, has removed the obstruction. It has been recommended by Dr. J. Hutchinson that an anæsthetic be given the patient; and thereafter the bowels thoroughly kneaded, and a copious enema be given while the patient is in an inverted position. Then he is shaken by several strong men, first in one position then in the other.

On consulting Dr. Nicholas Senn's great work on Intestinal Surgery, the physician will be convinced that when urgent symptoms arise, and a skillful surgeon can be found, it is safer to operate than to delay or try uncertain procedures. Laparotomy or enterotomy has been deprived of nearly all its dangers by the recent improvements in technique and aseptic precautions. The same advice can be applied to (5) strangulation, (6) twists, (7) knots, and to the removal of (8) large concretions and (9) foreign bodies. Instead of trying to remove them by purging, enterotomy should be resorted to.

Like many of my colleagues I have known of many instances when a bold and skillful surgeon might have saved many valuable lives. Twenty years ago I was called to a talented and promising young physician suffering from invagination of the ascending colon. He knew when it occurred—on jumping from his high buggy. He suffered the most agonizing pain for forty-eight hours, when I demanded that a surgeon be called in. He advised enemata, but I urged an immediate operation, to which the patient consented, but the surgeon would not operate. The patient died in twelve hours. The surgeon referred to became famous a few years after by operating successfully on a gangrenous intestine. If he had not been timid in the above case his fame would have come sooner.

NON-SURGICAL DISEASES OF THE RECTUM.

Diseases of the rectum have lately been too much relegated to the surgeon. It is supposed by many that nearly all the diseases of that portion of the intestine must be treated by some mechanical means. The early practitioners of our school went to the other

extreme, and believed that all diseases of the rectum could be cured by the properly selected remedies. The more conservative practitioners of the present day deprecate the insistency with which surgeons use the knife, the dilator, and caustics.

I confess that I belong to the conservatives, and believe that there are other measures besides surgical and medicinal which ought to be more practiced and advised by physicians.

Before entering upon the consideration of the non-surgical diseases, I propose to discuss the preventive treatment of rectal and anal disorders, with and without actual lesions.

HYGIENE OF THE RECTUM.

The rectum is the lowest portion of the large intestine, extending from the sigmoid flexure of the colon to the anus. It is not straight as its name would imply, but, commencing opposite the left sacro-iliac articulation, it is directed at first obliquely downward, and from left to right, to gain the middle line of the sacrum. It then changes its direction and curves forward in front of the lower part of the sacrum and the coccyx, and behind the bladder, vesiculæ seminalæ and prostate in the male, and at the back of the cervix uteri in the female. Opposite the prostate it makes another turn and inclines downward and backward to reach the anus. Seen from the side it offers two curves, one corresponding with the hollow front of the sacrum and coccyx, and the other at the lower end of the bowels, forming a shorter turn in the opposite direction. Unlike the rest of the large intestine the rectum is not sacculated, but is smooth and cylindrical, and it has no separate longitudinal bands upon it. It is about eight inches in length, and at its upper end is rather narrower than the sigmoid flexure, but becomes dilated into a large ampulla or reservoir immediately above the anus.

The muscular coat is very thick. The mucous membrane is thicker, redder, and more vascular than that of the colon, and it moves freely upon the muscular coat. It presents numerous folds of different sizes, and running in various directions, nearly all of which are effaced by distension of the bowels. Near the anus these folds are principally longitudinal, and seem to depend on the contraction of the sphincter muscles outside the loosely connected mucous

membrane. The larger of these are the columns of the rectum. The lower ends of these columns or ridges are often connected one to another by a web of mucous membranes, making little pockets called by anatomists *sacculi horneri*. In the same region are a few papillæ standing between the pockets. These pockets are much less distinct in some persons than in others, but in all perfectly healthy rectums, where the mucous membrane is normally thin and elastic, the lower end of the grooves between the columns will show hollows which sometimes are of considerable depths, but even if shallow, a little traction with a blunt hook readily makes them assume the form of sacculi or pockets, well adapted to deceive one not aware of the great elasticity of the membrane.

These sacculi have an important physiological function: they secrete a tenacious mucus, which is pressed out as the fæces descend and lubricates the mass so that it shall pass the anal opening easily. If these pockets are slit open or cut away that region becomes dry, and the fæces are no longer lubricated; a kind of rectal constipation results, which may cause ulcers, fissures, and external hemorrhoids. I am sorry to say that I have seen, not without protest, these normal sacculi cut away, under the idea that they were abnormal. I do not deny that these sacculi or pockets may become the seat of disease. Like the crypts of the tonsils, or those of the cervix uteri, they may become inflamed and ulcerated, and may then require removal. This fact has been recognized by surgeons for the last half a century. The causes of inflammation of these pockets may be attacks of dysentery, proctitis, foreign bodies lodging in them, etc. I have removed from them small seeds, bits of fæcal matter, gritty concretions, hulls of wheat and oats, etc., and these foreign substances should always be carefully looked for.

There is another anatomical feature of the rectum which should be mentioned. Between the lower ends of the grooves are frequently found a few papillæ; white, pointed, like the small teeth of a dog or cat, or like the carunculæ of the vagina, but smaller. These papillæ are tactile organs, and have their physiological uses. They are normally very sensitive, and have nerve connections with the muscles which are concerned in the expulsive efforts of the bowels. When the fæcal mass, or any foreign substance, is brought into contact with them, they transmit a reflex influence to the expulsive muscles. It

is through these papillæ that suppositories, glycerine injections, boric acid, and other substances act in causing a movement of the bowels. They, like the pockets, may become diseased. They may become paretic and insensible to stimuli, and fail to transmit an influence to the muscles governing peristastis or expulsion. This torpidity is one of the many causes of constipation. Or they may become unduly irritable and cause what is known as the irritable rectum, which is similar to the vaginismus due to an irritable state of the caruncles at the opening of the vagina.

Only when diseased and abnormally irritable should they be removed. Yet under the influence of the prevailing fashion they are often removed when they are perfectly normal. Some of the most distressing cases of constipation from rectal torpor I have ever known have been caused by the unnecessary removal of normal pockets and papillæ.

Now to revert to the subject of rectal hygiene, I contend that nearly all the functional or nervous disorders and pathological conditions of the rectum can be prevented by proper attention. The rectum is analogous to a mouth or buccal cavity, situated at the opposite end of the digestive tube. One of the first axioms of hygiene is to keep the mouth clean, to allow no foreign substance to remain between the teeth, or anywhere in the cavity. Why should not the same axiom apply to the rectum? It should, and in a much more thorough manner, and yet its cleanliness is almost absolutely neglected.

To begin in infancy and childhood;—the mother, nurse or physician should be on the alert to prevent any disorder from becoming seated in that sensitive, important part of the bowel. How many physicians give it a thought? In not a single work on Diseases of Children have I found a line devoted to this especial subject! Even if the infant be constipated never encourage the habit of giving irritating laxatives like castor oil, sulphur, or aloe, or of using suppositories of soap or paper. Instruct the attendant to insert her little finger (the nail carefully cut short), oiled with vaseline or olive oil, as soon as she observes an effort on the part of the child to evacuate the bowels; slowly and carefully the finger can be introduced without causing any pain or discomfort. If the efforts of the child do not expel the finger and the fæces, as it will generally do, then

slowly stretch the anal sphincter; if the hard, large mass is only partially expelled, a finger-tip should be placed in the sulcus just posterior to the anus, and pushed forward towards the rectum, when the fæcal mass will readily slip out. The process is singularly similar to the expulsion of the fœtal head from the vagina. By this simple method the rectum will soon learn to expel its contents without aid. It will also prevent undue stretching of the muscular coat of the rectum, avert piles, contraction of the sphincter, and prolapsus recti. The same method applied by a man or woman, young or old, will have the same favorable influence over many rectal disorders. If, on the other hand, the infant is observed to be frequently straining but is not costive, and if with each effort a little wind passes, accompanied by a small amount of mucus or fæces, we may be sure there is some irritation of the "papillæ" or "pockets"; but in such cases there is no necessity for surgical interference. The first thing to do is to wash out the rectum with a weak solution of borax, or hamamelis, or a one-tenth of one per cent solution of cocaine, using of the latter only a tablespoonful. These lotions will usually quiet the irritability. I have found that an ointment of one drachm of bismuth mixed with two of vaseline had a very soothing effect. If there is real proctitis, and the margin of the rectum looks red, angry, and protrudes, add to the above a grain of cocaine or half a grain of extract of opium. The same method applies to the irritable and inflamed rectums of adults, only the quantity of the anodyne can be proportionally increased.

I contend that in any of the rectal troubles of adults, the adoption of the above methods will enable the patient and physician to avoid a surgical operation. The plan I have adopted when consulted by patients, no matter what their position or station in life, is to tell them first to throw aside all false and unnatural modesty and to carry out my instructions. I then ask them to give me a minute and detailed statement of all the unpleasant sensations which they feel in the rectum and region of the anus. I never ask any leading questions, but allow them to detail their sensations in their own language. If I am in doubt as to the nature of the irritation or abnormal sensations, I ask for an examination, but I rarely find this necessary. I rarely find it necessary to use a speculum. The finger, if at all sensitive in the tactile sense, is sufficient to detect

ulcers, fissures, inflamed papillæ or sacculi. Then I instruct the patients themselves how to manage the treatment.

To illustrate the proper treatment I shall narrate a case. At the age of seven, the patient had an attack of typhoid fever that left him with a complete anal fistula. This was a constant annoyance, and indirectly brought on an obstinate constipation, with piles, pruritus, and a contracted sphincter. At the age of eighteen these disorders culminated in an attack of typhlitis which left him in a condition worse than before. At the age of twenty he studied medicine and commenced its practice two years later. But the fistula and other rectal troubles made life a burden until he reached a point at which he determined to have an operation performed. Coming under my care when I was making a thorough study of the anatomy and physiology of the rectum from such few works as I could find,—for intelligent and scientific essays on that subject were scarce,— I found on examination that the contracted sphincter was the apparent cause of most of the discomfort. After several weeks of careful manipulation, acting on my advice, he succeeded in thoroughly dilating the sphincter, using the index finger alone. During this process he found the "pockets" filled with concretions, seeds, and hulls, which were carefully removed every day, and the rectum thoroughly washed out after each morning evacuation. Notwithstanding this thorough morning cleaning, the patient was troubled with annoying pruritus ani at night which prevented sleep. He then found on examination at night that small particles and scybalæ came down during the day, and caused the irritation. These were thoroughly removed every night before retiring, and the anus and lower rectum anointed with bismuth ointment. Then the pruritus disappeared, and greatly to my surprise the fistula healed, and has never opened since, now nearly thirty years. This experience has led me to the convictions stated above, and whenever I have found patients willing to treat themselves in the same manner, the result has been gratifying to them and to myself, and deprived the surgeon of many interesting and lucrative cases.

The right position during defecation is the natural one, namely: squatting with the knees against the chest, and the chin resting on the knees. No other position was ever intended. The anatomy of the rectum makes this imperative. As before stated the lower por-

tion of the rectum curves forward just as the vagina does. The mechanism of defecation is singularly like that of labor. When the head of the fæcal mass descends it presses on the posterior portion of the rectum, distending the sulcus behind the anus, just as the head of the child distends the perineum. Then the mass moves forward and toward the anterior of the pelvis, and drops downward just as the child would if the mother was confined in a squatting position. Now the position which faulty water-closet arrangements make civilized people assume is the very one which most increases the difficulty of defecation and causes constipation. At first, the seat was ten or twelve inches high, but the height has increased of late until it is higher than the length from the sole of the foot to the knee. This position is not only unnatural but it is most uncomfortable. I believe the position is to blame for many rectal and uterine diseases and displacements. The expulsive efforts made in this position are not made in the line of least resistance, and consequently some tissue must suffer; this is generally the contracted sphincter, and the attitude explains why fissures are more common at the posterior border of the anus.

The proper arrangement in the water-closet should be this: The bowl should be small, not over eight inches wide, and sunk in the floor. This would allow the natural position to be assumed. If there must be a seat it should not be raised above the floor more than six inches high and the seat sloping from the front. If defecation could always be effected in the natural position in public water-closets the danger of contracting infectious diseases would be nil

HEMORRHOIDS, PILES.

Hemorrhoids are properly divided into *external* and *internal.*

External piles are either true hypertrophies of the skin, exaggerations of the natural rugose state of the anus, or rounded and elongated-looking tumors which pass up into the bowel.

Internal piles are tumors that originate within the anus, but which have been forced outside, and may have even put on a pseudo-cutaneous appearance from exposure. The two kinds may exist at the same time. The causes are: obstructions of the liver and portal system; fæcal accumulation which prevents the return of blood from

the terminal veins; chronic spasm of the external sphincter muscle, diarrhœa, dysentery, eating large quantities of meat, drinking alcoholic liquors, excessive smoking, a sedentary occupation, the pressure of the uterus in retroversion and during pregnancy, eating coarse food, or fruit containing seeds, and straining at stool.

It is astonishing that sensible men and women will sit and strain during a difficult stool, when the rectum is packed, and even when there is nothing in the rectum. I have known men strain with such an effort that a hernia was caused. Many fatal cases of apoplexy have resulted from these efforts. Women will strain at stool until the uterus is retroverted, or forced through the external outlet. They do not seem to know that by the proper use of the oiled finger any stool can be made easy, with a little patience. Half the cases of piles are caused by this senseless straining at stool.

External piles during an acute attack present the following symptoms: The small tabs of hypertrophied skin become swollen, œdematous, and shiny, exceedingly painful to the touch, and they sometimes ulcerate. An œdema may surround the anus, forming a large swollen ring of skin and everted mucous membrane all round the orifice. The color of the hemorrhoidal tumors is red, purple, or almost black; the blood in them can be forced back into the rectum, if there is not too much swelling. If irritated they set up a spasm of the sphincter and levator-ani, causing great suffering. This spasm often prevents sleep and causes great nervousness. There is a constant throbbing, and a sensation as if foreign substances were being pushed into the anus. This excites a desire to expel it, but any such effort aggravates. Walking, sitting, coughing, or sneezing greatly aggravates the pain. After the bowels have moved the pain is greatly increased. There is sometimes a good deal of fever, furred tongue, headache, and gastric disturbance.

Treatment. — If the attack is a first one, and has been brought on by excessive eating and drinking, or getting overheated, order one-half a glass of Rubinat water, or a dose of Epsom salts, to clear out the bowels. If this is objected to, have the patient take an enema of one or two quarts of water. I prefer the laxative. Then if there is fever give aconite until the temperature is reduced and the pain and nervousness relieved. Sometimes five or ten grains of phenacetin is better than aconite. After this the remedies most generally

indicated are æsculus, aloe, collinsonia, podophyllum, nux vomica, and sulphur. In recurrent cases, the treatment should be continued after the acute attack is over. The patient should be instructed as to diet and method of life, and above all to attend to the toilet of the rectum, as directed above. If this is scrupulously carried out the attacks will rarely recur.

My conviction is that too many remedies are recommended and prescribed for piles. Out of the sixty remedies mentioned as indicated by Lilienthal, I have never had occasion to use more than ten. Minor attacks of piles will get well unaided in a few days, and we too often give credit to the medicine prescribed. In obstinate cases it is useless to change the medicine often. If the medicine is really the similimum do not change to another every day or two.

During the intervals treat the patient and not the piles. Get at his pathological state, which is generally one of chronic portal congestion; remove that and the piles will not return.

Local applications are often useful to subdue the pain, relax the spasm, and reduce the congestion of the veins. For this purpose I know of nothing better than a distilled extract of hamamelis, to which is added cocaine or resorcin. Warm applications, or cold, if the patient prefers, are very grateful. Very hot water will sometimes seem to contract the tumors as ice does. An ointment of bismuth and cocaine will relieve some patients better than wet applications. If the tumors are very large and painful and the contents fluid, they can be aspirated or emptied through a small incision.

If a clot has formed, it can be turned out with great benefit and relief to the patient. A little aseptic cotton should be placed in the cavity for a few hours; there will be no hemorrhage unless the cavity opens into an internal vein, then styptic cotton is better to arrest it. I have cured some cases of external piles by injecting into them a few drops of carbolic acid and oil, equal parts, but serious accidents have resulted if the acid is thrown into a vein that connects with the general circulation.

INTERNAL HEMORRHOIDS.

The causes of internal piles are the same as those of external, but in addition, diseases of the genito-urinary system, childbirth, and hereditary influence should be considered.

During pregnancy external venous hemorrhoids are frequent, and these may and do often pass away after labor in common with varicoses of the legs and labia, but the reverse is the case with regard to internal piles.

The ingenious theory of Verneil as to the anatomical causes of internal piles is not accepted by other than French physicians, and Allingham presents strong argument against it. Verneil, acting on his theory published in 1864, anticipates the practice of Dr. E. H. Pratt, and asserts that all internal piles can be cured by "thorough dilatation of the external and internal sphincter muscles, no ligatures, no clamps, no cautery being needed, and no removal of the piles."

Fontau (Paris, 1877), in his work entitled "Cure of Hæmorrhoids by Forcible Dilatation," asserts the same.

Varieties.—I am inclined to adopt the three mentioned by Allingham: (1) capillary hemorrhoids; (2) arterial hemorrhoids; (3) venous hemorrhoids. Capillary hemorrhoids are small raspberry-looking tumors having a granular spongy surface, and bleeding on the slightest touch. These piles are situated rather high in the bowel, and although small, bleed profusely, and seriously drain the patient's strength. They consist of hypertrophied capillary vessels and spongy connective tissue. In the course of time, says Allingham, this variety passes into the arterial, the change being due to chronic inflammation of the coats of the capillary vessels, and an increase in the size of the arteries.

Arterial piles are tumors varying in size, sometimes very large, having a glistening surface, slippery to the touch, hard and vascular, and bleeding freely if scratched; the blood is bright red and spurts out.

Venous piles are often very large, sometimes the size of a hen's egg (Allingham), bluish and livid in color, and rather hard. The surface is smooth and shining; they prolapse very readily, do not usually bleed much, but if pricked the blood may be either venous or arterial. This kind is commonly found in women who have borne many children, or who have an enlarged or retroverted uterus, and often occur at the change of life. This species is called "passive," and is also seen in men with enlarged and indurated liver, in whom the portal system is constantly engorged. This is the form common in spirit-drinkers.

Treatment.—The treatment of each variety should be somewhat distinct. I think the physician should find out by an examination beforehand, which species his patient has, and prescribe for it, and not for the bare symptom. The principal symptoms of capillary piles are frequent pains in the back and loins, and in males in the spermatic cords and testicles; there is great lassitude and partial impotence. In women the menses may gradually cease, and a condition of profound anæmia set in from the constant loss of blood. It is evident that these cases should be treated by such internal medicines as will contract the capillaries, and arrest the oozing of blood.

Among the best remedies are aurum, millefoil, ergotin, hydrastis, nux vomica, etc. Locally, suppositories of the same should be used at night after the rectum has been thoroughly washed out with hot water; after the morning stool also using the hot water. If the sphincter is irritable and contracted, gentle dilatation, even with the fingers, is a great aid to the treatment.

Constipation must not be allowed to exist, and not a particle of hard fæcal substance should be allowed to remain to irritate the rectum. If they prove intractable, the rectum should be exposed by means of a speculum, and nitric acid should be carefully applied to the bleeding surface. Sometimes instead of the nitric, carbolic acid can be applied with great benefit. Allingham says he has applied an ointment of one-half drachm of the subsulphate of iron to a drachm of the unguent of cetaceum; or in a suppository (two grains to five of cocoa butter). "It does not cauterize, or irritate, but acts as a sedative, and arrests the hemorrhage with absolute certainty."

For the arterial piles, the chief remedies are those above mentioned. Also the same topical applications, except the nitric and carbolic acids and the iron. If they do no good in this variety, the surgeon finds here his true sphere of usefulness, and an operation is absolutely necessary, especially if they protrude at stool and cannot be put back or become strangulated. Here Whitehead's or Pratt's operation affords the most permanent relief and cure.

In the venous piles, especially when due to hepatic diseases with portal congestion, internal remedies conjoined with local applications and absolute cleanliness of the rectum will give excellent results.

The internal remedies are aurum, æsculus, nitric acid, muriatic acid, chelidonium, carduus, nux vomica, sulphur, euonymin, leptan-

drin, collinsonia, hamamelis, etc. The best suppositories are those composed of hamamelis, collinsonia, and æsculus. If the piles are attended with an acid, irritating discharge, a suppository composed of hamamelis, boric acid, balsam of Peru, and geranium, two grains of each, gives the best satisfaction of any I ever used; or, if preferred, an ointment of the same can be injected after each stool and at night. Suppositories of ichthyol, ten per cent, have lately been used with good results.

The diet of patients with venous piles should consist of plain farinacious food with white meats and fish; fresh acid fruits without seeds; no coffee or spirits, but tea and buttermilk as beverages. Plenty of pure water should be drank, and in some cases Carlsbad water in the morning, or a teaspoonful of Carlsbad salts in a glass of hot water.

The tendency and desire to strain at stool should be opposed by an active exercise of the will, and the introduction of the finger, well oiled with the ointment recommended above. If this is done at the beginning of a stool and the fæcal mass coaxed out, the tumors can be kept from protruding, and the desire to strain nearly always prevented. After stool the patient should lie down or assume the knee-elbow posture, and remain in that position half an hour with the finger pressed firmly against the anus.

The treatment of internal piles in women will be very unsatisfactory until any uterine displacements are first rectified. If there is retroflexion or retroversion, the womb should be elevated and straightened by cervical dilatation and pessaries. After this is done, it will often be found that the rectal trouble disappears spontaneously, for internal piles are often caused by the pressure of the fundus uteri on the rectum, obstructing the free circulation in the hemorrhoidal vessels. An Albert Smith soft or hard rubber pessary, bent into a suitable shape, is the best instrument.

PROCIDENTIA RECTI.

This condition commonly known as "falling of the bowels," must be distinguished from the prolapsus of piles. "Prolapsus recti is a descent of the lowest portion of the rectum, the mucous membrane and submucous tissue, both occasionally thickened, being turned out

of the anus. Now this condition differs from prolapsed hemorrhoids, thus: The hemmorrhoids exist as separate and distinct rounded tumors, while the prolapsus is a fold of mucous membrane surrounding the anus without any division into definite tumors, only the natural folds of the bowel being observed; generally there is one distinct fold towards the perineum, and the remainder form a horse-shoe-shaped projection around the sides and back part of the anus. The appearance and touch also of prolapsus differ from piles in its not being smooth, hard, and shiny, but soft and velvety." (Allingham.)

There is a variety of prolapsus which resembles intussusception, in which the upper part of the rectum descends through the lower part, resembling two cylinders, one within the other. This is often associated with polypi of the rectum.

A procidentia sometimes occurs conjointly with internal hemorrhoids, in which case when the gut is gently returned, there will still remain outside of the anus a ring of hemorrhoids.

Procidentia is more often seen in children than in adults; it also occurs in women who have borne many children, and sometimes in old men. It occurs most frequently in children, because in the infantile pelvis the sacrum is nearly straight, and also because children are apt to strain violently even when their evacuations are soft. Why this is so has not yet been explained, but I would suggest that as the reflexes in children are more irritable than in adults, the papillæ in which the reflex irritability resides may be more sensitive. There are also other causes more frequently present in children, such as diarrhœa, worms, phimosis, and perhaps stone in the bladder.

Treatment.— In adults nearly all cases might be cured by the patients themselves, by the exercise of common sense. If a patient finds that the rectum protrudes, it is almost always because he foolishly strains in order to expel a hard stool; even after the stool is expelled, the rectum has been irritated, and there is a sensation as if something remained that ought to be expelled, so the patient foolishly keeps on straining until the rectum is forced out. The remedy is plain. Direct the patient to introduce before the time for stool a gluten or glycerine suppository. These will lubricate the lower bowel and the anal opening, and soften the hard end of the stool. If it does not then slip out easily (or if a suppository is not used), direct the patient to oil the finger and introduce it gently into the

rectum, and stretch the sphincter, at the same time breaking down the hardened end of the fæcal mass. When the stool is expelled it is easy to explore the rectum and remove all pieces that remain. As soon as this is done, the patient should lie down for half an hour while he presses up against the anus. I have often advised patients to assume the "knee elbow position" after stool, with good results; this allows the bowels to be drawn back and removes the tendency to strain.

The treatment in children is based on the same principle. Mothers or nurses should never allow children to sit on a vessel or water-closet long. It is wrong to place a child in that position and leave it there for an indefinite period. This is a common cause of prolapsus. If the child does not expel the stool readily, or is inclined to sit after it is expelled, it should be taken away and made to lie down. Then the attendant should oil the little finger, and introduce it gently through the anus, and stretch it towards the anterior aspect of the body. This allows the fæcal matter to be expelled in its natural direction. As soon as it is expelled, firm pressure should be made up against the anus for five or ten minutes. This method will cure the worst cases of constipation, and prevent prolapsus. Druit, in his "Surgery," recommends that the motions should be passed lying on the side, or standing, "one buttock should be drawn to one side so as to tighten the anal orifice while the fæces are passing." This will answer better for adults than children.

If the child has dysentery or diarrhœa, it should be made, if possible, to evacuate the bowels lying down; this can be done by patience and perseverance. The child will submit after awhile. As soon as the evacuation is passed firm pressure should be made on the anus, and the recumbent position maintained for a time. It is my firm conviction that one-half of the fatal cases of dysentery in children could be saved if this method were persistently followed. If the tenesmus cannot be controlled by these means, and in some cases it cannot, it is justifiable and necessary to use a small injection of opium and starch water. This will quiet the local irritation and keep off for hours the desire to strain. If the prolapsus is an old one, and will not remain replaced, the case is one for surgery. A few bad cases have been reported cured by injecting into the sphincter small quantities (100th grain) of strychnine.

Cauterizing the prolapsed mucous membrane in streaks, with nitrate of silver, has cured many cases. The medicines recommended for prolapsus due to constipation, are nux vomica, ignatia, mercury, ox-gall, sulphur, aloe, and podophyllum; *not* in purgative doses, but just enough to arouse peristaltic action, increase the flow of bile, and soften the stools. The 1x or 2x triturations are efficient. If it occurs from diarrhœa and dysentery the remedies are croton oil, podophyllum, gambogia, mercurius, nitric acid, and aloe, all in the 3x to 6x attenuation.

All violent purgative drugs, especially those which act upon the lower bowels, are capable of causing both piles and prolapsus. Therefore any such drug may be the remedy for such conditions, if its symptoms correspond with those of the disease.

FISSURE AND ULCER OF THE RECTUM.

Most writers on diseases of the rectum consider *fissure* and *ulcer* to be similar.

Allingham says "the symptoms and treatment do not differ whatever form the ulcer assumes, whether it be elongated or club-shaped, oval or circular, but as a rule the small circular ulcer is situated higher up in the bowel than fissures are, which generally extend to the junction of the mucous membrane with the skin, the ulcer being more commonly found above or about the lower edge of the internal sphincter ani. I think also that in the circular ulcer there is less severe pain at the moment of defecation, but it comes on from five minutes to a quarter or half an hour after that act, and then is quite as intolerable as that resulting from fissure."

Fissure is not an uncommon affection, but it is not always recognized. Those who make no careful examination often treat it as piles. It has been seen in infants and in very old people. It is more frequently found in women than in men. Its usual position is dorsal. It may be brought about by the passage of a large, hard stool that tears the mucous membrane at the verge of the anus. This tear does not heal because at every stool it is re-opened. Another cause is the neglect of cleanliness of the parts. A daily wash with borated calendula will soon heal a recent fissure if the fæces are prevented from becoming large and hard, which can be done by means

of small injections of glycerine and water, glycerine suppositories, or the use of some saline laxative water like Rubinat, taken every morning. The ulcers found higher in the rectum are probably caused by some lesion of the mucous surfaces by foreign substances in the fæces, or as a result of acute proctitis or dysentery.

The pain from fissures is *during* defecation, or as soon as the fæcal mass distends the anal orifice. It is like tearing open a wound, or cutting through the skin, and is very excruciating. The patient cannot bear to move or stir from one position for some time after defecation. The agony induces the sufferer to delay defecation as long as possible, with bad results, for the fæces become harder and dryer the longer they remain in the bowel, and the pain of expulsion is greater. The pain sometimes lasts for hours or all day.

Does it not seem incredible that rational men and women, ready to devise means to relieve themselves of discomfort in other parts of the body, should suffer for months and years with this pain and not attempt some method of personal relief? It is partly lamentable ignorance and partly fear, which prevents the sufferers from trying to help themselves. Ninety-nine out of a hundred educated men and women have no idea of the anatomy of the rectum. They do not know that when a hard, dry, and large fæcal mass presents itself at the anal opening, there is any other way to expel it than to strain with all their power. They therefore forcibly expel the mass, tearing the mucous membrane, or forcing down the hemorrhoidal vessels. It does not occur to them, in the absence of suppositories, syringes, or oil, that they can manage to get rid of this mass, without inflicting on themselves injuries that it may take years to cure.

The free use of saliva, which is equal to oil, will enable any person to insert a finger into the anal opening and meet the descending mass. He can then stretch the sphincter slowly, until it can almost allow the fæces to pass out. If not, he can remove the hard portion in small pieces until the upper, soft part of the mass is reached, when it will pass without injury. Therefore I contend that injury to the rectum and anus need never happen, and that fissures, piles, and ulcers can be prevented by the use of a little common sense.

On examination of the anus, with the patient on the side, raise the upper buttock with the hand, and then with the finger and thumb gently open the anus, at the same time telling the patient to bear

down. You will then be able to see just within the orifice an elongated club-shaped ulcer. The floor of it may be very red and inflamed, or, if the ulcer is of long-standing, of a grayish color with the edges well-defined and hard. I have frequently found these fissures at the base of a small pile-tumor, or a small club-like papilla, or polypoid growth.

You may, in some cases that present all the subjective symptoms of fissure or irritable ulcer, fail after the most careful examination to find any lesion. This failure was probably what led Dr. Dolbeau, of Paris, to assert that "the essence of this disorder is neuralgia," and he defines fissure of the anus as being a "spasmodic neuralgia of the anus."

Allingham, commenting on this assertion, declares that of the thousands of patients he has examined, presenting the symptoms of fissure or ulcer, he has never failed to discover some lesion, though sometimes very slight.

Dr. Kelsey ("Diseases of Rectum and Anus"), illustrating how difficult it is to discover the ulcer, relates a case where, after failing to find a fissure or ulcer, he thought he would pass a probe into each of the sacculi or pockets; on entering the third the patient screamed with pain, there was spasmodic retraction of the levator and sphincter muscles, and the part was forcibly withdrawn from view. On opening the sacculi with a probe-pointed tenotome, the ulcer was exposed at the base of the pocket, which looked like an ordinary fissure of the anus. A cure of the fissure was then easily accomplished.

Treatment.— For surgical treatment consult Allingham, Pratt, Kelsey, or Gross. No medical and topical treatment will avail unless the rules for absolute aseptic cleanliness be carried out by the patient. In an old number of the "American Homeopathic Review" Dr. Lippe gave the indications for several medicines for fissura ani. They were ignatia, nitric acid, graphites, pæonia, platina, ratania, rhus tox, and silica. I have tried them all and have never seen good results from any but ratania, which has the following symptoms: "burning in the anus like fire, preceding and accompanying defecation, and lasting a long time after it, accompanied by varices." This does not show the true symptoms of fissures, but rather of ulceration of the sacculi with hemorrhoids. The history of this drug and its use in

fissure is interesting. It is a powerful astringent, discovered in 1779 in Peru by Ruiz, who found that it was used for spongy and bleeding gums, and all passive hemorrhages. Its botanical name is Krameria.

Bretoneau, believing that the rectum was always enlarged by continued distension in cases of fissure, and that by restoring it to its proper size and power he could cure this disease, prescribed an enema of the watery solution of ratany, and actually succeeded in curing many cases. Trousseau (Therapeutics) directs it to be used as follows: An emollient enema is administered every morning to empty the bowel, and half an hour afterwards a solution of a drachm or two of ratany in five ounces of water is thrown into the bowel. The bowels should be kept open by means of one-fifth to one grain of powdered root of belladonna. The patient's sufferings for the first two or three days will be aggravated, but this annoyance is usually temporary, and is followed by inexpressible relief."

Hartlaub's provings do not mention constipation as one of its symptoms; but the pains, burnings, and varices are connected with loose stools.

I have cured several cases of fissure or irritable ulcer of the rectum with piles by following Trousseau's method. I have also used a suppository of cocoa butter containing five grains of the extract of ratany, with equally good results. Graphites is of no value except in the fissures attending eczema.

Peonia or platina I never use, nor do I believe them of any value; nitric acid is useful in all rectal affections when hepatic disorder is the cause. It is of great value when applied as a caustic to ulcers, fissures, and other open lesions of the rectum and anus.

Several cerates are of value in such cases. One of the best is made by Gross & Delbridge after my original formula given them fifteen years ago, and named "sedative saxoline." It is composed of calendula, boric acid, and balsam Peru. This should be applied (not on the outside) but inside the rectum, and at the anal orifice. Patients, unless they are especially ordered, will only rub it outside the anal orifice. If they cannot smear it all over the lower rectum they should procure some ointment-syringe like Hutchinson's, by which they can throw it into the rectum.

Forcible dilatation is now generally practiced by surgeons for the

cure of fissure of the anus, but I believe a patient can cure himself by gradual, gentle dilatation, and the use of ointments. It may take longer, but he will avoid the probability of paralysis of the sphincter.

Allingham's method is probably the best. He uses a knife through the speculum, commencing the incision a little above the upper end of the fissure, terminating the cut a little beyond the outer end, so that the whole sore is cut through; the depth of the incision should not be less than a quarter of an inch. If there is a bit of inflamed skin at the outer end it should be removed with a pair of scissors. After this, a few days rest on a sofa is all that is required, with an application of the sedative saxoline. When the bowels move for the first time they should be aided by an enema of glycerine and water. There are cases where neither Allingham's nor Pratt's, nor any other local treatment will cure, because the disease is a proctalgia, a true neurosis, imitating exactly fissure or ulcer. Such cases require constitutional treatment, rest, galvanism, a sea voyage, or change of climate. I have observed that many persons suffer only when travelling, or when they become costive; as long as they have loose evacuations no pain is experienced. Others again have the same pain during a diarrhœa. In these last cases I imagine some nerve filament is exposed, for the slightest touch will bring on a paroxysm. One such case was cured by the application of pure carbolic acid. Another by the application, under cocaine, of nitric acid.

DISEASES OF THE SACCULI HORNERI.

These sacculi have recently been named rectal "pockets," and some surgeons consider them always abnormal. Other authorities standing just as high consider them "normal structures, whose function is to hold mucus which is forced out during defecation to lubricate the margin of the anus and protect it from hardened fæces." (Prof. Smith in Andrews' "Diseases of the Rectum.") The same opinion is held by Dr. Andrews himself, a veteran and experienced surgeon, also by Drs. Gross, Kelsey, Ashurst, Allingham, Esmarch, Curling, and other eminent writers on the Anatomy and Diseases of the Rectum.

The wholesale removal of them cannot therefore be justified or

sanctioned as good surgery. As well might the gynecologist remove all the crypts and pockets in the uterine cervical canal. But they do sometimes become diseased, and when this occurs removal is justifiable.

I have described their appearance in health, and I have often observed them in their normal condition. They are lined with a beautiful, delicate mucous membrane, which moves freely on the parts beneath, and stretches readily in any direction. They are usually half-filled with a clear transparent mucus, which can be squeezed out by pressing on their lowest portion. When they are in this condition they should never be meddled with.

I have frequently seen them in a diseased condition. Then they are greatly enlarged, deepened, and of a red, livid color, and filled with a purulent and sometimes bloody secretion, and very sensitive when the probe is passed into them. Great credit is due to Dr. Pratt (see his "Orificial Surgery") for pointing out the frequency of diseased conditions of the sacculi, and the benefit arising from their removal. But I believe he goes too far when he asserts that they are not normal structures, and that "their removal is always attended with benefit to the patient, whether they be irritable or not." He adds that "after an experience upon thousands of cases, extending over a period of several years, I am compelled to advise their thorough eradication at all times and under all circumstances."

It is Dr. Pratt's practice, as well as that of all his disciples, to dilate the sphincter, remove all the papillæ and hemorrhoidal tumors which may be present. I have never been able to ascertain if they have ever removed the sacculi alone without dilating the sphincter, or any other operation. Therefore their testimony must be taken with many grains of allowance. I contend that a proper attention to the cleanliness and toilet of the rectum is capable of preventing diseased conditions of these "pockets." These conditions are nearly always caused by the irritation of hard, large fæcal masses, or small particles of fæcal matter, seeds, bran, sand, and innumerable other small substances which enter and remain in the sacculi. All these causes can be prevented if the directions given under Hygiene are fully carried out. The upward firm pressure of the finger, inside of the sphincter, all around the rectum, is able to press out of these pockets all foreign substances, unless too firmly lodged therein.

The physician, by means of the speculum, can treat these pockets without removing them, in a large majority of cases. If on examining them through the speculum they are found in an ulcerated, irritable condition, they should be emptied of their contents, and with a delicate bent applicator, the end wrapped with a film of cotton, moistened with peroxide of hydrogen, their cavities should be cleansed. If there is pus present, the foaming of the contents when brought in contact with the peroxide will be of diagnostic value. When cleaned out, apply a fifty per cent solution of the tincture of iodine, carbolic acid, or iodized phenol. These measures will cure many cases and render their removal unnecessary. Dr. Pratt's method of removal is to insert a blunt hook, and raise their roof by traction; then with a curved scissors the expanded pocket is snapped off as close as possible to the rectal surface, completely destroying the sacculi. I cannot leave this subject without narrating two cases which were typical cases of failure, after the operation of removing the sacculi.

(1) A woman of forty was sent to me from a distant city, to be treated for cardiac disease, complicated with chronic diarrhœa. In a few weeks the heart's action was much improved, but I could not benefit the diarrhœa by any remedy. The diarrhœa was "in the morning driving her out of bed," but sulphur in the 3d or 200th did not benefit her. It was just such a diarrhœa as we invariably find in ulcer of the rectum, but on a careful examination of the rectum through several different speculums, I could not discover a single lesion. The diarrhœa was aggravated or brought on by mental emotions or sudden excitement. This led me to believe it to be a neurosis of the abdominal and rectal nerves. Through the advice of a friend she went to an orificial surgeon who promised a cure. He dilated the sphincter (which was too lax already), cut out the papillæ, removed the pockets and a small pile or two, dilated the cervical canal and the urethra, and would have dilated any other orifice if he had found it. Not the slightest improvement was gained. On the contrary she has not been able fully to control her fæces and urine since that time, now two years. This case was one of malpractice; there was nothing abnormal to remove, nothing which should have been dilated.

(2) A case of obstinate constipation. All the operations men-

tioned in case (1) were performed. There has been no improvement in any respect, but the bowels are moved with more difficulty than before.

DISEASES OF THE RECTAL PAPILLÆ.

As before mentioned these papillæ are normal organs, which have a distinct function — that of conveying reflex impressions to the upper bowels. There are not always the same number in different persons, but there are always a few.

Dr. E. H. Pratt says, "Papillæ are not constant in rectums, and I believe there is now no dispute as to the necessity of their removal when they exist." Dr. Pratt is mistaken, for there are several authorities on anatomy who consider them normal tactile organs. I admit that they frequently become diseased, and when that occurs their sensibility becomes greatly heightened, and may cause abnormal reflex irritation; but we should be sure they are diseased before we remove them. Whenever I find them exquisitely hyperæsthetic, I do not hesitate to remove them, but so long as they present a sharp point, a conical shape, and a white color they are not diseased. When they look red, and the artery which supplies them is swollen, or when the point becomes bulbous, then the removal of such papillæ, and no others, is a justifiable operation. When they become diseased they resemble neuromata such as we meet with in other portions of the body. I have seen some bad results from their removal — a peculiar constipation such as I have mentioned under Hygiene of the Rectum.

In one case of chronic diarrhœa the surgeon found a good many, and finding nothing else of an abnormal character in the rectum he removed them. The result was that the woman who had before that time been able to control the stools became the victim of involuntary defecation.

PROCTITIS.

Inflammation of the rectum may result from extension of colitis or from dysentery; or it may arise from impacted fæces and foreign bodies. It may occur without any complication, as the result of exposures to cold, like sitting on damp ground, or a cold stone. It may be catarrhal. I have known of many instances in which the patient was attacked with sneezing, chilliness, and some fever, and

soon after complained of a feeling of weight, heaviness, and heat in the rectum with a constant desire to defecate. On introducing the finger there will be more than usual difficulty in passing the sphincter. The bowel will feel hot and there will be throbbing. In the first stage the mucous membrane will be moist and smooth. There will be involuntary tenesmus, which might be likened to the act of sneezing, for during the spasm there is some thin mucus expelled. Later on the discharge becomes thick and bloody, yellow, white, tenacious, and stringy. It is often mistaken for dysentery or hemorrhoids. I have seen cases when no piles or other lesion existed. In children it is often caused by worms. It may be a manifestation of gout. Drastic purgatives, and especially aloe, podophyllum, gamboge, rhubarb, mercury, and many other drugs cause proctitis. It may be gonorrhœal, in which case it happens more frequently in women than men. Finally, it may arise from irritating suppositories, or application of nitric acid and other caustics, and from unnecessary and forcible dilatation.

Treatment.— During the first stage, before any discharge occurs, the remedies are aconite and belladonna; afterwards aloe is the principal remedy. No drug gives such a complete picture of acute or chronic proctitis (uncomplicated), or when it is attended by piles. Gambogia, æsculus, sulphur, and ratany, are all useful in certain cases. When the disease is acute, give the 3x; when chronic, the 1x. Dr. Allingham says he has cured a great many cases in old people with "small doses of aloe," by which he probably means a fraction of a grain several times daily. A weak solution may be used in an enema, and a small quantity, one-fourth of a grain, in a suppository.

Local Applications.— In the stage of congestion enemata of hot water give relief. I prefer for this purpose the instrument used by gyneocologists for irrigating the uterus, which allows the water to pass out through an extra tube. Borax, distilled hamamelis, borated calendula, etc., may be added to the water. If the tenesmus is violent and constant, as is often the case with children, a few drops of opium in a little starch-water should be injected. In the stage of mucous or muco-purulent discharge, injections of aqueous hydrastis or a solution of hydrastine (white hydrastis), is almost specific, especially when the mucus is thick, tough, stringy, and profuse.

Copaiva and cubebs may be indicated by the appearance of the discharge, and should be given internally (1x trituration), or better, in a pill that would be soluble only in the intestines, and locally in the form of injections, or suppositories. I have cured several cases with eucalyptus internally, five drops of the tincture every four hours, and with injections of eucalyptol water; muriate of ammonia, and asarum may be indicated in rare cases. If the discharge is obstinate and resists the above medicines, use a strong solution of extract of ratany, extract of geranium, or extract of hamamelis, ten grains to an ounce of calendula water, or eucalyptol water.

The bladder is sometimes severely irritated by sympathy, and will require cantharis, triticum repens, corn-silk, buchu, or turpentine.

Dr. Strizovere (Sem. Med., 1893, No. 11) recently reports several cases of rectal catarrh: "I have employed an enema consisting of a solution of carbolic acid, with success, in three cases of inveterate chronic catarrh of the rectum. The first patient had for nine months been suffering with diarrhœa, the cause of which could not be made out, and had been treated in various ways without effect. Digital examination of the rectum gave rise to much pain. The rectal mucous membrane was velvety and softened. The stools, of which there were three or four every day, presented a gelatinous appearance. An injection of ten drops of carbolic acid in two tumblerfuls of water was given morning and evening, and retained from six to ten minutes. From the third day of the treatment, the motions became less frequent, whilst, at the same time, the fæces assumed a more natural appearance. At the end of a month the patient was cured, without any special attention having been paid to regulating his diet during the time he was under treatment. The second patient has been ailing for seventeen months, the diarrhœa ceasing at intervals for two or three months at a time. Complete cure was obtained at the end of six weeks under the administration of the carbolized enemata. The third patient had an attack of dysentery two years previously, from which he recovered, but he had since been suffering from chronic catarrh of the rectum. He complained of diarrhœa with the passage of mucoid stools, which had proved refractory to all previous treatment, but disappeared in a fortnight with the carbolic acid injections."

PROCTALGIA.—Neuralgia of the Rectum.

There is no doubt of the existence of a veritable neuralgia of the rectum. It may occur without the slightest lesion of that part, and the bowels may move normally. It is not connected with defecation, but may occur in paroxysms from the same causes as other attacks of neuralgia. It is sometimes confined to the sphincter, but even then does not act like the pain from fissure or ulcer. Allingham believes some cases of proctalgia to be a "very intractable form of myalgia." This disease is called by some writers "irritable rectum." The pain is often so violent as to cause fainting and hysteric spasm. It shoots upward into the back and abdomen, and into the ovaries or testicles. Any violent handling of the rectum aggravates intensely. It is analogous to some varieties of vaginismus. Dilating the rectum does not cure it, but has aggravated it in many cases under my observation.

Treatment.— Prescribe for the general pathological state and the totality of the symptoms. The medicines most useful are arsenic, aurum, nux vomica, ignatia, phosphate of potassium, and arseniate of strychnine. Ointments or suppositories of hamamelis, belladonna, conium, codeine, ratany, cannabis indica, strammonium, or cocaine are useful. In one case the only palliative relief was from hypodermatic injections of codeine, one-fourth of a grain with atropine 100th grain injected into the sphincter.

Phenacetin has lately been useful in my hands, three to five grains every two hours. Very hot water enemata have sometimes given relief.

PRURITUS ANI.

Painful itching at the anus is a most distressing symptom. It cannot be called a disease of itself, for it is but a symptom of many other diseases or morbid conditions. It may arise from disease of the liver, internal piles, constipation, anything causing pressure on the hemorrhoidal veins so as to retard the return of blood from the rectum, errors in diet, gout, parasites, etc. All these causes are enumerated by medical writers, but not one mentions that cause more potent than all others, uncleanliness of the rectum and anus. If the same care were taken of the rectum as is taken of the mouth,

diseases such as this would be rare. The writer was for several years a sufferer from this symptom but it disappeared in a few weeks under strict local cleanliness. I admit that the use of alcohol, shell fish, and all very high seasoned food may have much to do with the causation of this pruritus; it may be a purely neurotic symptom, as any other form of pruritus. I am confident, however, that the presence of foreign substances and irritating secretions in the lower rectum is the chief exciting cause. I also have no doubt that a diseased condition of the sacculi or "pockets" is a common cause, for I have known it to disappear when the pockets were treated or removed. The itching and irritation is generally worse at night, especially when the patient gets warm in bed, so that the greater part of the night is rendered sleepless and wretched. If he falls asleep he wakes himself by a scratching that always aggravates the irritation. It may continue all day, and may be caused by coming into a warm room from the cold outside air. It sometimes amounts to an actual pain — a real proctalgia, in which sharp, needle-like pains shoot up the rectum, and down the thighs.

There is usually not much change in the aspect of the anus. The skin may be a little roughened, thickened (and more rugose), just around the margin. Sometimes there is a distinct eczematous rash, the parts being always moist from the exudation.

Allingham mentions one condition which he considers characteristic in old cases, namely, the loss of the natural pigment of the skin. To such an extent does this often obtain that patches around the anus extending backward as far as the sacrum and forward to the scrotum are of a dull, dead white, the skin looking more like white parchment than natural integument, and if you pinch it up you will feel that it has lost its normal elasticity. I have seen the same condition induced by genital pruritus in women. I have observed the same peculiarity and have known it to be present at the anus, perineum, and vulva.

Treatment. — If on examination no abnormal appearance is discovered on the outside, you may be sure the disease is in the anus or rectum. On stretching the anus, fissures or small piles may be found. One of the most common appearances is a small pile with a fissure at its base. I have often cured this fissure by one or two applications of a pointed stick of nitrate of silver, or nitric acid

applied on the sharp point of a glass pipette. The small tumor can be cured by injecting with a hypodermic syringe, two to four drops of equal parts of carbolic acid and olive oil. If no disease of the anus is found, inspect the rectum and you will probably find an ulcer, or ulcerated sacculi, or some small foreign body in one or more of them. Cut down on the margin of the ulcer, or remove the diseased pockets or the irritating particles, and treat it as heretofore described, and the pruritus will disappear.

If the anal sphincter is spasmodically or permanently contracted, instruct the patient to anoint his finger with bismuth ointment, or boric acid salve, and stretch it before and after each stool, at the same time removing all detritus from the rectum. If he will not continue this method, or if it fails, gently dilate it every few days. If the cause is eczema the same rules of cleanliness should be advised, and the following ointment prescribed:

℞ Ichthiol	drm.	i.
Balsam Peru	drm.	i.
Vaseline	oz.	i.

This should be applied to the external parts and the orifice. Another very soothing ointment, always palliative and often curative, is:

℞ Boric acid	drm.	i.
Cocaine	gr.	v.
Vaseline	oz.	i.

Ointments containing opium should never be used. They leave a secondary irritation worse than the original, and tend to increase any previous constipation. I have known instances where they led to the opium habit. The use of washes does little good. Soap should not be used. A teaspoonful of borax to a quart of water makes the best lavement. In eczema, soapy water aggravates. Water aggravates all eczematous diseases. Ointments of zinc, carbolic acid, mercury, lead, etc., are advised, and may have to be prescribed in obstinate cases. Internal medicines are of little value. In eczema, graphites is indicated. Collinsonia has been found useful when piles were present.

Arsenic is said to have cured many obstinate cases in doses of one to five drops of Fowler's solution, three times a day, for several weeks.

Hepar sulphur, internally and topically, is highly recommended by Hebra.

Coffee causes intense pruritus in many persons, and it might be tried as a homeopathic remedy.

Phosphate of soda, when the itching is aggravated in bed at night, and is perhaps due to hepatic disorders, or deficient excretion of bile.

Polyganum (smart-weed) has a great reputation in domestic practice. An infusion is used as a wash, and a teaspoonful taken frequently internally. The following might be used:

℞ Tinct. polyganum . . . . . drm. iv.
Water . . . . . oz. iv.

To be applied at night, and one-half an ounce injected.

A ten per cent solution of nitrate of silver when there is a red, raw circle around the anus, will often give prompt relief.

Suppositories containing cocaine one grain, cannabis indica one-half a grain, creosote two drops, menthol one grain, may be used as palliatives.

DIPHTHERIA OF THE RECTUM.

This condition has been mentioned by several writers. One of the most malignant cases of diphtheria I ever saw, in a female child of two years, commenced with a deposit of false membrane in the rectum and on the vulva. The mother called my attention to it before the membrane appeared in the throat. The child had at that time high fever; the next day the tonsils, pharynx, and palate were invaded. It should be treated with lotions and an enema of peroxide of hydrogen, and the administration of cyanuret of mercury internally.

PERITONITIS.

Acute inflammation of the peritoneum. This may be idiopathic, but it is said to be rare. When we consider how frequently the pleura and pericardium are inflamed, the rarity of idiopathic peritonitis is very remarkable. When it does occur it is caused by cold and exposure, and is generally rheumatic in its character. Osler says he never saw such a case, but Bristowe writes as if it were not an uncommon affection. I am sure I have seen many cases of rheumatic peritonitis. I recall three, two of which were fatal, that were

caused by prolonged exposure while bathing; and one fatal case caused by remaining too long — four or five hours in the cold water — at a natatorium. They began with rigors a few hours after the exposure, followed by vomiting, dysuria, fever, burning, aching, tearing, and twitching pain, beginning in the region of the navel and radiating to all parts of the abdomen. The fatal cases were badly neglected, and for several days treated with domestic remedies. Those which recovered were treated with aconite, belladonna, colocynth, and dioscorea, and recovered in five or six days.

One of the saddest cases that ever came under my observation was that of a brilliant and promising young man, who after riding, asleep, in a railway car, exposed to a draught of cold air blowing through the open doors, was after a few hours attacked with a violent chill followed by fever, temperature 103°, excruciating pains all over the abdomen, with excessive tenderness on pressure, and great suffering on the slightest movement. Shortly after the onset I was called in and prescribed belladonna and colocynth. In a few hours he was relieved. I advised a warm flaxseed poultice to the abdomen and ordered the medicines continued all night, and requested to be called in the morning if he was not much better. This occurred on Monday. I heard nothing more of the case until Friday night at midnight, when I was summoned to his bedside; he was dying, and on acquainting the parents with the fact they were profoundly astonished, and refused to believe me. I requested counsel, who on arriving confirmed my opinion. The patient died in a few hours. I then learned that his sister saw him on Tuesday morning, and being insane on the subject of "Christian Science," insisted on "treating" him herself. All kinds of food and raw fruits were permitted, and no applications to the abdomen were allowed, but notwithstanding the fact that the patient's sufferings increased from hour to hour until he died, the sister insisted that he "would get well if he would not believe he was sick." No comments are necessary.

In nearly all cases of peritonitis the principal symptom complained of is pain. This usually occupies the lower abdomen, and is comparatively trivial so long as the patient is perfectly quiet. If he has not taken to his bed, he sits, moves, and walks with his body bent into a stooping posture. Soon, however, the inflammation extends and the pain increases, even during rest, and is aggravated

beyond endurance by the slightest movement. He is obliged to lie motionless on the back, with the head raised and the legs drawn up. He breathes with the intercostal muscles only, and the inspirations are very shallow. He shrinks from the pressure of the hand, cannot bear the weight of the bed-clothes, or of the poultices and fomentations. If he coughs, sneezes, vomits, or hiccoughs, or if he makes a deep inspiration, he is in agony. The temperature does not usually run very high, 101° to 102°, but in some cases reaches 105°.

The skin is hot and dry, the face flushed, pulse quick and sharp, respirations thirty to forty per minute, the tongue coated and clammy, if not dry; vomiting and thirst may be present, the bowels generally constipated, but diarrhœa may be present. The urine is scanty, high-colored, frequent and painful, or retained.

If the disease takes a favorable turn, which it may in a few days, the pain, tenderness, and fever subside and convalescence sets in. But if the disease tends to a fatal termination, the abdomen becomes distended, partly from effusion of fluid, partly from gas in the intestines, the pain and tenderness may become aggravated, or cease entirely (an ominous symptom), vomiting and hiccough appear, the temperature falls, the face and extremities become cold and livid, cold sweat appears all over, the pulse rises to 141 or 160, the respiration to 40 or 60 per minute, with loss of consciousness, collapse, and death. In some cases delirium followed by coma occurs before death.

Puerperal peritonitis arises from extension of inflammation from the uterus and ovaries, and is generally associated with pyæmia. For a most graphic description of this form of peritonitis, I refer the reader to Dr. Comstock's article in the last edition of Leavitt's "Obstetrics."

Peritonitis from perforation has been considered under the head of Typhlitis and Appendicitis. Certain manifestations of la grippe may be mistaken for peritonitis. During its prevalence in Chicago, especially when it first appeared, several cases occurred in my practice that I supposed were rheumatic peritonitis. The pain was intense, and was aggravated by the same conditions that aggravate the sufferings in true peritonitis. In some patients the temperature was high, in others sub-normal. After the attack had lasted a few days I expected tympanites and symptoms of gravity, but they did

not appear. The condition usually lasted several days without change, or suddenly changed its location and attacked some other portion of the body.

The so-called hysterical peritonitis may deceive the most astute physician, even if he knows his patient to be hysterical. The attack may present every feature of true peritonitis, and the collapse itself may be simulated. Even the temperature will be elevated. Bristowe mentions a case which recurred three times during a year. In my own practice I have had several undoubted cases that were purely hysterical.

The treatment of acute idiopathic peritonitis is not very satisfactory to either school. It is so often complicated with other conditions that we cannot treat it as an entity.

There are but few poisons capable of causing inflammation of the peritoneum without causing at the same time enteritis.

Arsenic, mercury (especially the bichloride), nitric acid, and turpentine certainly cause peritonitis, but that they cause uncomplicated peritonitis has not been proven. All the drastic cathartics may cause an entero-peritonitis; also cantharis, erigeron, oil of pennyroyal, and oil of tansy. Bryonia ought to be able to inflame the peritoneum as well as the pleura. The same treatment recommended for typhlitis will apply to this disease.

ASCITES.

Definition.— Dropsy of the abdomen; an accumulation of serous fluid in the cavity of the peritoneum.

The causes are chronic inflammation of the peritoneum — simple, cancerous, or tuberculous; portal obstruction in the terminal branches within the liver, as in cirrosis or other structural diseases; tumors of the abdomen, and enlarged spleen. It may be a part of general dropsy, as in chronic heart disease; or from emphysema or cirrosis of the lungs. In some cardiac lesions the dropsy is confined to the peritoneum, in which case it is due to secondary changes in the liver. It occurs as a result of Bright's disease, and from a watery state of the blood.

The diagnosis by means of palpation, percussion, and aspiration, are fully given in standard works on diagnosis, and need not be repeated here. I always empty the bladder by catheterization as the first step in diagnosis, for a distended bladder has been mistaken for ascites; so also have an ovarian tumor, pancreatic and hydatid cysts.

The ascitic fluid is not always a clear serum. It may be light yellow as in the ascites of anæmia and Bright's disease; and a darker color in cirrosis of the liver. The specific gravity is low, 1.010, while that in ovarian cysts is 1.020 or 1.015. It is albuminous and coagulates spontaneously, and is sometimes bloody. A chylous, milky exudate is sometimes found, and fat globules may be seen in it.

Treatment.— I am sure that in the treatment of chronic peritonitis I have arrested the effusion by means of arsenic, turpentine, and bryonia. Besides giving these remedies internally I order the following mixture rubbed into the abdominal wall twice daily: oil of turpentine, half an ounce; ichthyol, half an ounce; vaseline, six ounces.

If the distension becomes great, pushing up the diaphragm to the extent of causing dyspnœa, and the bowels are torpid, relief may be obtained by the use of Epsom salts or elaterium. I have seen a portion of the fluid apparently disappear after the hydrogogue operation of such agents. This is especially the case in dropsy from heart diseases. Generally ascites often passes into the stage when tapping becomes absolutely necessary. Sometimes repeated tapping results in a cure in chronic peritonitis, and gives relief for a long time in cirrosis of the liver. I have seen permanent drainage by means of Southey's tube make the patient quite comfortable.

This subject will receive further attention when treating of dropsy from heart and renal diseases.

Apocynum cannabinum has, for many years, had an extraordinary reputation as a "vegetable trocar." There are very many cases on record where it has run off the abdominal dropsy. Sometimes it acts on the bowels like elaterium; at the same time acting as a powerful diuretic. It does not act as favorably in idiopathic ascites as when ascites arises from disease of the heart and liver.

DISEASES OF THE LIVER.

I.—FUNCTIONAL DISORDERS.

Before describing the functional disorders it will be best to give a brief view of the functions of the liver in health.

Murchison in his work on "Functional Hepatic Disorders" gives the following resumé:

(1) "The formation of glycogen, which contributes to the maintainance of animal heat and to the nutrition of the blood and tissues; and the development of the white corpuscles.

(2) The destructive metamorphosis of albuminoid matter, and the formation of urea and other nitrogenous products, which are subsequently eliminated by the kidneys; these chemical changes also contributing to the development of animal heat.

(3) The secretion of bile, the greater part of which is reäbsorbed, assisting in the assimilating of fat and peptones, and probably in those chemical changes which go on in the liver and portal circulation, while part is excrementitious, and in passing along the bowel stimulates peristalsis, and arrests decomposition.

Prof. Dujardin Beaumetz, in his interesting "Lectures on the Modern Treatment of Diseases of the Liver" (recently published by G. S. Davis, Detroit), has described the functions of the liver in a clear and concise manner; any attempt to condense his lecture would result in marring it, so I shall give it in full. He says:

"If the anatomy of the liver has made manifest progress the past few years, and seems to-day almost complete, it is necessary to bear in mind that the knowledge of the physiology of this organ has not kept pace with that of the anatomy, and there are still certain functions of the liver concerning which physiologists are not completely agreed. Nothing, perhaps, in the history of medicine is more interesting than a general survey of the endeavors which have been made to find out the functions of the liver. For centuries the world accepted with unquestioning faith the doctrine of Galen, who taught that the hepatic gland was the centre of animal heat and the organ which presided over sanguinification. Then came the discovery of the bile, in the seventeenth century, and all the old doctrines were lost sight of, and the liver was reduced to the simple office of an emunc-

tory, designed to separate from the economy an excrementitious liquid, the bile. But modern experimental physiology was destined to restore to the organ the high functions which were assigned to it by Galen and his school. In fact, it is, as you know, in the liver, in the hepatic cell itself, that Claude Bernard places the glycogenic function. The same organ also, according to Murchison, Brouardel, and Charcot, is the seat of that physiological process which is the most manifest expression of the combustions of the economy, namely, the production of urea. Lastly, a great number of physiologists are of accord in affirming the hæmatopoietic functions of this gland. As you see, the liver has regained in our day its former high importance. From a therapeutic point of view, the study of the functions of the liver is, it must be admitted, much more limited; we have really observed only the action of certain substances on the biliary secretion, and are ignorant of the actions of medicaments on the liver as a glycogenic organ. As for the liver considered as a reducer of urea, physiologists are far from being fully agreed. To the labors of Murchison and Brouardel have been opposed other experiments and researches, and in particular those of DeSinety and Martin, which go to show that perhaps too much has been affirmed as to the relation of the liver to urea-formation, and that this excrementitious principle has not for its exclusive seat of production the hepatic gland, but that it is formed in all the glands and all the tissues of the economy.

"But there is one point in this study which ought to detain us longer: I allude to the passage of medicinal substances through the liver after having been introduced by the digestive tube, and their more or less prolonged sojourn in this gland. This is one of the most interesting subjects connected with the physiology of the liver, and you will see that by virtue of the experiments of Lussana, Heger, Schiff, and Jacques, we may derive therefrom fruitful therapeutic results. You are aware that for a long time physiologists have known the possibility of the accumulation of certain toxic substances in the liver, and it is a rule in legal medicine in cases of poisoning to analyze the liver in order to find there traces of arsenic, copper, lead, and other substances which have been suspected of determining symptoms of poisoning. Paganuzzi, of Padua, was the first to show the difference which exists in the mode of elimination when certain salts of

iron are introduced by the veins of the general circulation, and when they are introduced by the mesenteric veins; in the first case the salt is eliminated by the kidneys, in the second by the bile. Lussana, basing himself on some previous experiments of Schiff, since verified by Rosenkranz, researches which have shown that the bile secreted in the intestine returns to the liver to be eliminated anew, verified the experiment of Paganuzzi, and affirmed as the result thereof that the reconstituent and hæmatopoietic effects of ferruginous preparations are due to the intimate action on the hepatic cells of the salts of iron, which, when introduced by the digestive tube into the liver, are then eliminated by the bile, and pass back again into the liver by the entero-hepatic circulation described by Schiff.

"In 1873, Hegar, of Brussels, applying to the elucidation of this question Ludwig's ingenious method of artificial circulations effected in isolated organs, discovered that when blood containing a large dose of nicotine is made to pass through the hepatic gland, this alkaloid disappears completely in the liver, so that you no longer find any trace of it in the hepatic veins. In 1877 Schiff discovered that not only does nicotine in passing through the liver lose its toxic properties, but that other alkaloids are almost as completely destroyed by this gland, and he mentions among the latter hyoscyamin. Lastly, in 1880, Victor Jacques, a Belgian physician, completed these researches by showing that a certain number of alkaloids introduced by the digestive passage sojourn awhile in the liver, and that some are in part destroyed in the hepatic gland, and that others may be eliminated after a limited time whether by the bile or lymphatics.

"What is the intimate action of these substances on the hepatic cells? Are more or less stable combinations formed with these alkaloids, which either destroy the properties of the latter, or which, being slowly dissociated by an access of albumen, are thereupon eliminated anew? We do not know, but it is none the less certain that these researches enable us to explain facts heretofore very obscure. Among these facts is the marked difference which exists between the effects of medicaments, and in particular of alkaloids, when introduced by the mouth and when administered by the hypodermic method. The prompt and energetic action of subcutaneous injections finds an easy explanation. The medicine passes imme-

diately into the general circulation, and brings its therapeutic or toxic action to bear upon different parts of the economy. When introduced by the mouth, however, the alkaloid passes into the liver, and there is in part destroyed or tardily eliminated by the hepatic gland, hence we see the superior advantage of hypodermic injections, which render every day such marked service; and we can never be too grateful to Wood, of England, and to my very regretted Master, Behier, for having introduced and popularized this method. This complete destruction or tardy elimination of alkaloids by the hepatic gland gives us a physiological explanation of two other orders of facts: (1) the inocuousness of certain poisons introduced by the mouth, such as a curare, of which Claude Bernard has shown the absolute inefficacy when absorbed by the alimentary canal; and (2) the phenomenon so frequently observed when certain alkaloids are given by the mouth, and particularly the alkaloids of the solanaceæ. I refer to the tardy effect of these alkaloids, and what Gubler has described under the name of "accumulation of doses." You are acquainted with all these facts; you know that when we give atropine or duboisin in very minute doses and for several days in succession, we are in danger of seeing symptoms of poisoning set in, although the daily dose remains the same. To-day, by virtue of the experiments which I have just mentioned, we have a clear and scientific explanation of these facts. The alkaloid is absorbed by the digestive tube and fixes itself in the liver. Then, at a variable time, it is eliminated into the intestine with the bile, or passes into the circulation with the lymphatics, and its presence goes to augment the portion which is absorbed into the general circulation of the daily dose which you have administered. Permit me to add a word: I have just told you that medicaments introduced under the skin and passing directly into the general circulation are eliminated by the kidneys. I shall show you, as we go on, that if this elimination is wanting, the therapeutic effects of the alkaloid cease, and give place to toxic symptoms. It would be important to study, as opportunity may occur, the influences of the diseases of the liver, and in particular of those which completely destroy the hepatic cell, such as cirrhosis, on the action of alkaloids introduced by the mouth. Here there is an important series of researches to be made, to which I invite your attention. But this action of the hepatic gland does

not pertain exclusively to the vegetable alkaloids, but also, and equally, to the toxic alkaloids which we have seen to be incessantly produced in the economy. In my work on Diseases of the Stomach and Intestines, I showed you the important part which these ptomaines or leucomaines play in the economy, and I dwelt on the elimination by the different emunctories. The liver has an important function in the elimination and destruction of these toxic products. Hence, when its parenchyma is altered, you can understand how these toxic substances may accumulate in the blood and produce their deleterious effects, effects which play a preponderant role in the symptoms which accompany destruction of the hepatic gland. This discovery of the morbid poisons which the economy produces during life, and the important part which the liver plays in such cases, justifies somewhat the view set forth by Lautenbach several years ago.

"The liver is the organ that secretes the bile, and from this point of view it possesses for us a great therapeutic interest, for there are numerous substances which modify the biliary secretion; these are called cholagogues. But before setting forth the physiological experiments which demonstrate this action, I shall make a few remarks concerning the bile and its secretion in the normal state. Considered in the most general manner, bile is constituted of three elements: cholesterine, which the researches of Berthelot have caused to be classed among the monatomic alcohols, is a fatty substance which presents itself to the microscope under the form of rhomboidal tablets. You know also that these crystals have a characteristic reaction which consists in the red coloration which they assume in contact with sulphuric acid. To-day everyone is agreed in adopting the theory of Flint as to the origin of this substance, and Vulpian, in his remarkable "Lessons on the Bile," has accepted this view, which regards cholesterine as a product of disassimilation of the nervous substance. Feltz and Ritter have shown, on the other hand, that this substance when it accumulates in the blood does not produce any grave toxic symptoms. As for the bile pigment, bilirubin, it is an azotized non-albuminous principle derived from the decomposition of the coloring matters of the globules, whose properties Tarchanoff and Vossius have thoroughly studied; in fact, from a chemical point of view, there is a great similarity between hæmatin and bilirubin, and you will see

when we come to take up the subject of Jaundice that the possible transformation of the former into the latter has given a name to a special form of jaundice, hæmatogenous jaundice (icterus sanguinis). We shall see, also, that bilirubin has a characteristic reaction, and that the most important and best known is that determined by nitrous-nitric acid, which in contact with bilirubin gives a play of colors: red, green, blue, yellow, and brown.

"But the truly essential part of the bile consists in the biliary salts, glycocholates, and taurocholates of sodium. You know that these two acids easily break up, the one into cholic and cholalic acids, the other into taurin and glycocol. Pettenkoffer has given a means of readily detecting these acids. If you subject them to contact with a mixture of sulphuric acid and sugar, you see them take on a beautiful violet-purple color.

"These acids give their principal character to the biliary secretion, and, in fact, while we have seen that cholesterine originates in processes of disassimilation of the cerebro-spinal axis, and the coloring matter of the bile has for its origin the hæmatin of the blood globules, the biliary salts are formed solely in the liver, and are a product of a secretion of this gland. This is, you must remember, a fact of capital importance, which clearly differentiates the kidney from the liver, and while the one does nothing but separate from the economy substances which have accumulated in the blood, the other produces from elements in the blood special substances which are characteristic of its secretion. The experiments of Muller, Lehmann, Kund, and especially the beautiful experiment of Molesschott, who performed ablation of the liver in frogs, and did not find the biliary acids to accumulate in the blood, are absolutely demonstrative on this point. Where is the bile elaborated? Must we admit, as Charles Robin suggests, that it is the glands of the bile ducts that the secretion of the biliary acids takes place, while to the hepatic cell is reserved the glycogenic function? Must we locate in the hepatic cell itself this secretion?

"This is a question which the researches of Kölliker seem to have solved, for he found the biliary acids in the hepatic cells. It is, then, in the cell that the secretion of bile takes place, and remains for us to study what are the influences which cause this secretion to vary. In the physiological state, the bile, as Colin has shown, flows

continuously into the intestines, but this flow is subject to intermittences; for example, during the periods of digestion, and under the influences of certain emotions, the secretion is much augmented. We shall study more at length the various modifications in the biliary secretion in a future lecture devoted to biliary lithiasis. You know that when we tie the hepatic artery we do not cause the secretion of bile to cease. It is the same when the ligature embraces the portal vein, leaving the artery intact. What do such experiments show? They prove this, that owing to the numerous anastomoses, it suffices that the hepatic gland shall be supplied with blood, it matters not from what source, in order to accomplish its function of secretion. This is so true that when you bleed animals you see the secretion of bile notably diminish; on the other hand, if you make an intra-venous injection of water, the biliary secretion is augmented. But there is a physiological process which notably augments this secretion, viz: digestion, or more strictly speaking, the irritation produced by food or chyme in the intestinal mucosa. There is in these cases a double action: first, an augmentation in the production of bile, then augmentation of the excretion caused by increase of the contractile movements, of which the gall-bladder and its ducts are the seat.

"In this regard, there is a fact noticed by Rohrig and Vulpian which presents a great interest, viz: that when you inject water into the intestine of animals under experimentation, you see the secretion of bile augment. As for the influence of the nervous system on this secretion, it is not at all doubtful; at the same time, experiments in this direction are not very decisive. Certainly, the vaso-motor nerves —vaso-constrictors and vaso-dilators—undergo there, as everywhere else, modification from reflex influence, but, as I have said before, we need more light on the subject."

THE ACTION OF MEDICINAL AND OTHER SUBSTANCES ON THE LIVER.

In order to treat understandingly disorders of the liver we must ascertain how medicines, foods, or other substances affect the liver. We must know what substances increase and what decrease the flow of bile. We ought also to know what agents have no effect on that function. Formerly it was by examination of the stools that physi-

cians thought they were enabled to classify these medicaments, and according as the stools were more or less bilious, the medicine was considered to have a greater or less action on the liver and was called "cholagogue" (bile-producing). This method was not a very scientific one, and unfortunately in all our provings this method only was followed. The provers did not even test the stools for bile (by chemical tests), but relied on their odor, color, and appearance. Even if tests had been applied, the appearance of bile in the stools will not prove that the drug acted directly on the liver, for many substances cause an increased flow of bile by their irritation of the duodenum and other portions of the intestinal canal.

A brief history of the latest methods of investigation may be of interest. "In 1863 Hanfield Jones was the first to enter on this experimental method. He gave certain medicinal substances to animals which he afterwards killed, and he then examined the state of the liver and intestine; according as he found the hepatic gland more or less congested, he concluded that the medicament had a more or less energetic action on the biliary secretion. This, it must be admitted, was a somewhat rude and primitive process, which had been nevertheless put in usage by previous experimenters and in particular by Pecholier in studying the action of calomel.

"In 1867 and 1868, the British Association, which has done so much to elucidate important problems in therapeutics, and in particular that of the action of alexipharmic medicines, and of antagonism in therapeutics, submitted the question of cholagogues for discussion, and appointed a commission consisting of Arthur Gamgee and Hughes Bennett to undertake a series of experiments to ascertain the action of the so-called cholagogues. This commission made an important report, based on numerous experiments performed upon dogs, which were all put on the same diet and subjected to the action of certain medicaments whose influence on the biliary secretion was then studied by careful analysis. In 1873, Rohrig, in Germany, completed and perfected this mode of research. He curarized dogs and subjected them to artificial respiration. Then, after taking care to empty the gall-bladder and tie the cystic duct, he introduced into the extremity of the common bile duct a tube ending in a tapering point, like a dropping-tube; then, by the aid of a metronome beating seconds, he counted the number of drops of bile flowing in a given

time by the tube, and thus studied the action of the different substances introduced into the stomach or digestive tube of animals under experimentation. You see that quite an improvement was effected in the way of scientific definiteness, as indicated by the distance which separate the method of Jones from that of Rohrig; but progress did not stop here. Rutherford and Vignal, in 1875, repeated and improved the processes of Rohrig; they proceeded at first as did the latter experimenters, that is to say, they curarized the animal, emptied the gall-bladder, and applied a ligature to the cystic duct, but instead of introducing into the common bile duct a simple tapering tube, they employed a glass pipette adapted to a rubber tube, terminated at its distal extremity by another glass tube dipping into a graduated test measure; then they calculated the quantity of bile secreted in a given space of time. In some preliminary researches these experiments proved first of all that curare has no action on the biliary secretion, and that during the entire duration of the experiments the bile kept its composition almost unchanged; then they showed that in the normal state in the dog the quantity of bile secreted is about 20 c. c. per kilogramme of the weight of the body and per hour, and it is by relying on this later figure that they established the coefficient of cholagogue medicaments. This word coefficient, then, indicates the quantity of bile secreted in an hour and corresponding to one kilogramme of the weight of the animal; the more that figure exceeds the sum of 20 c. c., the greater the action of the medicament on the biliary secretion. Note in this connection that the substance under experimentation was not introduced by the mouth, but inserted into the duodenum."

I will not give all the medicines that Rutherford and Vignal mention, only those of special interest to practical therapeutics. The following are in the order of their importance, according to Rutherford:

Podophyllin with bile.	Sanguinarin.
Podophyllin without bile.	Colocynth.
Euonymin with bile.	Colchicum.
Euonymin without bile.	Phosphate of sodium.
Salicylate of sodium.	Nitro-hydrochloric acid.
Corrosive sublimate.	Baptisin.
Benzoate of sodium	Hydrastin.
Iridin.	Jalap.
Ipecacuanha.	Rhubarb.
Benzoate of ammonia.	Juglandin.
Phytolaccin.	Leptandrin.

The experiments of Rohrig, on the one hand, and of Rutherford and Vignal on the other, do not agree respecting the relative action of these cholagogues on the biliary secretion, as may be seen by the following classification:

According to Rohrig:	According to Rutherford:
1. Colocynth.	1. Podophyllin.
2. Jalap.	2. Rhubarb.
3. Aloes.	3. Aloes.
4. Senna.	4. Colchicum.
5. Rhubarb.	5. Senna.

The latest experiments by Provost and Binet differ from those of the former. Their method was to establish a permanent fistula from the gall-bladder, the track of which was opened from time to time for the experiments. The authors lay stress upon this, as they claim for the method advantages over the cannula in the estimation both of the normal flow and that under medication. This fistula it was found did not disturb the health of the animals if fat was kept out of their diet. According to these experiments bile itself is the most powerful cholagogue known. Next in importance are euonymin, benzoate and salicylate of sodium, and salol. Another experimenter, Professor Mussy, gives a table of medicaments increasing the flow of bile. The following is his order of their activity: aloe, podophyllin, salicylate of sodium, physostigma, sanguinaria, iridin, bichloride of mercury, euonymin, nitro-muriatic acid, ipecac, juglandin, colchicum, hydrastin, phosphate of sodium, baptisin, leptandrin, and rhubarb. It will be observed that these various experiments do not altogether agree. This is probably due to the different methods employed. For example, while one experimenter rates aloe and phosphate of sodium very high, others claim that they have but feeble influence over the secretion and excretion of bile.

For myself I place more reliance on the experiments of Provost and Binet. The medicaments which actually diminish the secretion are (according to all experimenters) iodide of potassium, calomel, iron, copper, atropine, strychnine, and sulphate of magnesia. It was a surprise to all the experimenters that calomel, which from time immemorial had been considered the chief of all cholagogues, should have, or appear to have, such an opposite action. Dujardin-Beaumetz, commenting on this, says: "From the time of Paracelus and Von Helmont down to our days, physicians have vaunted the

action of calomel on the liver; the green stools produced by this medicament were considered an undoubted sign of the elective action of calomel on the hepatic gland; and whatever Stillé may have said to the contrary, who affirmed that the color of the stools produced by calomel were due to a subsulphuret of mercury, it is to-day demonstrated by the experiments of Golding Bird and Simon, and especially by the researches of Michea, that this coloration is due to a biliary pigment. If clinical experience is unanimous in affirming the cholagogue action of calomel, quite as decided agreement and unanimity exists among experimental physiologists in denying this action. Consult the experiments of Scott, Mosler, Kölliker, Müller, of Bennet, of Rohrig, and of Rutherford, and all will tell you that calomel does not augment the secretion of bile in the dog, but that it diminishes it. How are we going to reconcile results so contradictory? Some authorities, and in particular Fraser, have attempted an explanation; the experimenters, they say, put themselves in special conditions which were different from what one observes in the man whether well or sick. Between the curarized dog, living by artificial respiration, and the man, there is a great difference. But this argument seems to me to miss the point, and for this reason: If it were sound we ought to reject in toto all the experiments on cholagogues, for the same objection applies to all the experiments, which would thereby be hopelessly vitiated. But this none of the authorities are willing to grant, and there is general agreement that the results of the experiments as far as most of the medicaments are concerned are trustworthy and valid. Murchison seems nearer the truth when he says that mercury augments the biliary excretion without augmenting the secretion; *i. e.*, by exciting the contractions of the bile ducts, by modifying perhaps the bile itself, calomel causes a greater quantity of bile to flow into the intestine, without, however, augmenting the secretion of this liquid. I am inclined to take the same view of the case as Murchison, and, while giving the precedence to clinical experience over physiological experimentation, I persist in regarding calomel as one of the best cholagogues; but I would associate with it another mercurial preparation, which some have supposed to be void of cholagogue properties, namely, corrosive sublimate. In fact, while the mild chloride of mercury, when administered experimentally, diminishes rather than augments the biliary

secretion, the corrosive chloride, on the contrary, according to Rutherford, augments this secretion; therefore, I advise you when you wish to obtain the full benefit of the salts of mercury in the treatment of hepatic affections, to combine calomel with corrosive sublimate, and to prescribe pills containing ten centigrams of calomel and two milligrams of the sublimate. These pills, in the dose of one or two at bedtime, have a marked cholagogue effect."

One of the most interesting and ingenious articles on the action of calomel and other mercurials is by Professor W. H. Porter (in "Merck's Bulletin," July 15, 1892). He says: "The action of the mercurials upon the hepatic function is exercised in three successive, characteristically distinctive stages, to-wit: as stimulants, as cholagogues, and as depressants. As the mild chloride, or calomel, possesses all these qualities to a marked degree, it is perhaps the best example by which to elucidate the complete action of mercury upon the hepatic and digestive functions. The blue mass and the gray powder act in the same manner; but, if anything, are a little less active. The bi-chloride has a similar action; but its more irritating properties make it less valuable, or even useless, as a cathartic principle. Still it can be used as a powerful hepatic stimulant, and as an adjunct to the cholagogue function of calomel. The exact modus operandi by which mercury in any form produces the wonderful results upon the system that have been attributed to it for ages has always been more or less in doubt for the lack of a logical explanation; yet the most skeptical, after watching the effects of a few doses of this drug upon the human system, cannot deny the power and utility of mercury. Taking the stand that the inorganic compounds are not decomposed within the animal organism, no time need be wasted in speculation regarding the decomposition of any of the mercurials into other compounds. How then shall the action of mercury and its compounds be explained? Calomel, for instance, is almost insoluble; consequently it in itself is comparatively non-irritating to the intestinal tract. At the same time it is known to be one of the most active cathartic compounds of mercury. Two almost contradictory propositions. The cholagogue action of calomel cannot be explained by any direct irritating action which it can produce upon the alimentary tract, through the increased peristalsis, by reflex irritation, causing an increased flow of bile. This non-irritating

character of calomel is just what gives it its chief power. Passing down the alimentary tract without producing irritation, it is steadily absorbed into the entero-hepatic circulation and carried up to the liver. At this point of the animal economy, the mercurial appears to act like a foreign body, and the hepatic cells, by their selective action, pick up the little particles of calomel from the blood, and eject them into the capillary bile-ducts. In accomplishing this task the hepatic cells are called upon to perform more work; and if the amount of the calomel passed through the liver is small, its action is simply to stimulate the organ to a little greater activity. For a time the hepatic cells secrete a little larger quantity of bile, and such as has a little better quality. Up to this point the calomel has only been stimulating and physiological in its action. If now the calomel is administered in larger quantities, either by frequently repeated small doses or in one large dose, the eliminating action of the hepatic gland is greatly augmented. At the same time the protoplasmic elements which constitute the hepatic cells are stimulated by the passage of this foreign body through their substance, to a more active production and elimination of the bile acids. When sufficient calomel has reached the liver to produce this copious flow of the bile acids, the acids are discharged into the capillary bile-ducts more rapidly than they react upon the alkaline phosphates or carbonates and form the normal and neutral bile-salts. When this hyper-secretion of the bile acids is established, a cholagogue action is developed. This action, however, can be only temporary in character, because the protoplasmic vitality will in a comparatively short time be exhausted. After this excessive production of the bile-acids and their discharge, together with the calomel, there is a period of protoplasmic exhaustion, in which the bile-producing function of the liver is held in abeyance. Viewed in this light, calomel and its class of mercurials may be stimulating, cholagogue, and depressing in their action upon the functions of the hepatic gland, — one condition following in quick succession after the other. The rapid intestinal peristalsis and frequent discharges from the bowel are not the direct result of the mercurial action, but a secondary effect, which has been brought on by the irritating properties of the bile acids so copiously discharged into the intestinal canal, as just shown. This fact is established by the lack of cathartic action by calomel in cases of the occlusion of the

common bile-duct; and, furthermore, by the counter-test that where bile acids are administered medicinally, a brisk cathartic and cholagogue action is at once established. This hyper-secretion of the bile acids and its consequent effect upon the intestinal tract is not in any sense a physiological action, but it is strictly a pathological process. But by developing this abnormal condition in the functional activity of the hepatic gland, the liver-cells are stimulated to perform an abnormal amount of work, often vicarious in its nature, and by which the cells are empowered to expel many abnormal and by-products from the system, a task which in their normal condition they are absolutely unable to perform. In this manner nature rids herself of many foreign and offending substances, which, if allowed to remain and multiply within the system, would in a short time destroy the animal vitality, a result too often seen in cases imperfectly treated. The period of inaction, which is imposed upon the hepatic cells as a sequel to this excessive action, gives the protoplasmic elements a chance to rest and to imbibe a more serviceable nutritive pabulum, thus augmenting their nutritive activity and enhancing their functional vitality. When the hepatic cells again resume their physiological work, they are in a condition of high nutritive tone; and consequently the secretory and excretory work of the liver is more perfectly effected. The intestinal and hepatic transmutation of the food-elements is more perfectly accomplished; and as a natural sequence all the nutritive processes of the body are intensified; secretion and excretion in general are more perfectly performed; and the animal vitality is raised to a higher standard. If the system has been poisoned by any form of microbic or ptomainic toxin, or is the seat of any inflammatory action, toxic or otherwise, the organism is, by the above described processes, placed in the best possible condition to destroy the ætiological factors and remove the resulting pathological processes, and thus restore everything to a normal condition. By a somewhat similar physiological action the well-known antiphlogistic power of the mercurials can be explained. Following this method of action for the mercurials, ptyalism and all that class of toxic symptoms produced by mercury and its compounds can be rationally explained. The same reasoning also shows clearly that the size of the single doses has little if anything to do in determining the liability to mercurial salivation. If from any cause the hepatic cells

are inactive, and thus fail to respond to the presence of the mercurial salt and to eliminate it as speedily as it reaches the hepatic gland, then the mercurial will pass over into the general circulation; where finally the salivary glands will attempt to perform the work of elimination that should have been accomplished by the liver cells. In like manner, when the calomel is given too freely, or when opium is given to check the cathartic action, the hepatic cells either become exhausted from over-taxation, or they are retarded in their action by the opium; and then the mercurial passes into the general circulation. Thus, again, the toxic symptoms with salivation will be produced. So long, however, as the hepatic cells retain their selective and excretory activity it is absolutely impossible to develop the toxic symptoms of mercury. The use of enormous doses may become the cause of exhausting the hepatic cells, whereupon poisoning will, of course, rapidly ensue."

There are some points about the experiments with drugs on the liver which should be carefully considered.

(1) It has been suggested that although these drugs caused an increase or decrease of bile in the canine liver, they need not therefore have the same effect on the human liver. But this objection is not valid, because experiments prove that all these drugs produce the same intestinal, gastric, and general effect in the dog as in man. The dog is really nearest to man in its gastric, intestinal, and hepatic functions.

(2) In no experiments were repeated small doses used which approximate our lowest attenuations. This is the weak point in all these experiments. The doses used were very large, often toxic, as seven to fifteen grains of podophyllin; three to five grains of iridin, euonymin, hydrastin; and ten grains of jalap or colocynth. But the use of such large quantities led to an important discovery, namely: that if the doses were large enough to produce violent purgative action the secretion of bile was diminished. Another discovery was that if a very large dose was given and did not purge, the secretion of bile was arrested or diminished. This shows the futility of large doses of cholagogues given to increase the flow of bile. It shows, too, that an overwhelming dose of a cholagogue drug has the same effect as the secondary effect of the same drug, for in many of the experiments after the first increase of bile, there

appeared a notable decrease. This is shown in practice, for the old school well knows that mercurials act in that way. Not only this, but it is well known that cholagogues, like anodynes, require an increase of the dose to continue specific effect.

(3) It was observed that the cholagogue effect of all the drugs was greatly increased when given mixed with bile. In fact some of the drugs would not cause an increase of the secretion of bile, unless a small amount of bile was allowed to pass from the gall-bladder into the intestine, or unless some ox-gall was mixed with the drug. These facts prove to my satisfaction that when we prescribe bile-producing medicines in bilious diarrhœa, we should give the very smallest doses, much smaller than when the stools are deficient in bile.

(4) It was observed that in some cases where the quantity of bile was increased, its solid constituents were not decreased during the hours when the drug was acting. The bile was thinner, but the constituents were the same qualitatively. In other cases the amount of bile, both quantitatively and qualitatively, was increased.

(5) The question arises, How do these drugs act? Do they increase the secretion of bile by irritating the duodenum or small intestines? This cannot be, for the drugs which most cause such irritation really decrease the secretion of bile, and some drugs which do not act on the intestines at all increase greatly the secretion of bile.

Do drugs stimulate the hepatic cells by increasing the stream of blood through the liver? This may be a cause in some cases, but not as a rule, for it has been observed that drugs that dilate the intestinal capillaries do not necessarily increase the bile.

Rutherford, Headland, and Porter all believe that "the effect of hepatic stimulants is to be assigned to a direct action of their molecules upon the hepatic cells or their nerves." One of the chief functions of the liver is to seize upon the molecules of metals, alkaloids, glucosides, and perhaps resinoids and oils, and destroy their toxic qualities to a certain extent. The molecules which the hepatic cells cannot destroy they store up or eliminate.

The digestive tract is a wonderful and mysterious laboratory. It separates ultimate active principles from all organic substances not used as food. These active principles, purely molecular, finer than

any chemist can conceive, are sent to the liver to be destroyed, or appropriated by the hepatic cells. Thither also are carried the molecules of all inorganic substances having an affinity for the liver. The molecules of mercury, copper, iron, lead, and other minerals have been found in the liver. It also attracts to destroy, or store up for some unknown use, the toxic alkaloids formed in the intestines—those ptomaines and leucomaines which are such virulent poisons. I have heretofore stated my belief that the curative powers of all drugs reside in their molecules. There is no dynamic, imponderable, or immaterial influence residing in drugs. These molecules act either by contact with the cell itself or on the nerves which supply it. When a drug is so attenuated that the molecules are absent or nearly so, then the curative power is lost. This may occur in some drugs in the sixth, in others in the twelfth or even higher.

There are some causes to be considered which may hinder or altogether prevent the action of the best selected cholagogue remedy: *e. g.*, we may give the 1x or 3x of podophyllin when the secretion of bile is scanty or absent, and are surprised that no expected effect occurs. This may not arise from a wrong selection of the drug, but because the intestinal contents are abnormal—that certain ptomaines are formed therein; are absorbed and carried to the liver, and that the hepatic cells are so busy in destroying or eliminating them that the molecules of podophyllin cannot find entrance to them.

Another cause may be the depression of function caused by a feeble circulation of blood through the liver. This condition does occur in some disease of the heart, and some disorders of the intestines, as in dysentery or cholera.

LITHÆMIA.

This term was introduced by Murchison to designate certain symptoms, due, as he supposed, to functional disorders of the liver. His views have been widely adopted, but of late there has been some dissent from them.

Murchison defines lithæmia as follows: "When oxidization is imperfectly performed in the liver there is a production of insoluble lithic (uric) acid and lithates (urates) instead of urea, which is the soluble product resulting from the last stage of oxydation of nitrogenous matter."

So long as the lithic acid and lithates are eliminated in a soluble form through the kidneys, no harm is done to the general system. But when this does not occur nearly all the important organs suffer, and the poisonous effects cause those conditions known as biliousness, gout, indigestion, etc. The causes of this condition may be summed up in a few words—imperfect digestion, with the formation of toxines which the liver has not functional activity enough to destroy; a sedentary life, without exercise enough to keep up the normal functional vitality of the organs of digestion and elimination; eating too much, and the abuse of alcoholic liquors. Murchison enumerates the following as the most common symptoms of this condition: "(a) A feeling of weight and fulness at the epigastrium and in the region of the liver. (b) Flatulent distention of the stomach and bowels. (c) Heartburn and acid eructations. (d) A feeling of oppression and often of weariness and aching pains in the limbs, or of unsurmountable sleepiness after meals. (e) A furred tongue, which is often large and indented at the edges, and a clammy, bitter, or metallic taste in the mouth, especially in the morning. (f) Appetite often good; at other times anorexia and nausea. (g) An excessive secretion of viscid mucus in the fauces and at the back of the nose. (h) Constipation, the motion being scybalous, sometimes too dark, at other times too light, or even clay-colored. Occasionally attacks of diarrhœa alternating with constipation, especially if the patient be intemperate in the use of alcohol. (i) In some patients, attacks of palpitation of the heart, or irregularity or intermission of the pulse (usually only when sitting or lying). (j) In many patients, occasional attacks of frontal headache. (k) In many patients, restlessness at night and bad dreams. (l) In some patients, attacks of vertigo or dimness of sight, often induced by particular articles of diet."

To which I will add melancholia, amounting sometimes to insanity, and violent neuralgias of the face, head, and other parts of the body. Among the conditions which he says may be caused by lithæmia are urinary calculi, oxaluria, biliary calculi, degenerations of the kidneys (he believes bilious lithæmia to be one of the chief causes of Bright's disease); structural diseases of the liver; degeneration of tissues throughout the body; arterial sclerosis, etc.

Osler, who is always skeptical, says: "It is by no means sure

that, as Murchison supposed, the essential defect is a functional disorder of the liver, disturbing the metabolism of the albuminous ingredients, nor is it at all certain that the only offending substance is uric acid. "Deficient oxidation is probably the most essential factor in the process, with the result of the formation of less readily soluble and less readily eliminated products of retrograde metamorphosis."

One of the most prominent signs of lithæmia is the presence in the urine of an excess of uric acid.

The amount of deposit does not always indicate the amount present in the urine. Clear urine which does not deposit a sediment or thicken on cooling often contains a large amount of uric acid (Bence Jones). The uric acid usually occurs in combination with ammonium and sodium, forming acid urates, or it may separate from its bases and crystallize in cubes and prisms of a deep red color, looking like grains of cayenne pepper. The late Dr. J. W. Dowling, of New York, was a good pathologist and a successful physician; his views of lithæmia, embodied in one of his lectures, are so excellent that I quote those portions of it that are most practical.

"Although arising from the same cause, a distinction should be made between gout and lithæmia, and Murchison, in his celebrated Croonian lectures, delivered in 1874, made this distinction — defining gout as a condition in which the urate of soda crystallized out into the cartilages of the joints and into other portions of the body, giving rise to a train of symptoms familiar to us all, and known and described by all of the ancient medical writers as gout. Although every gouty subject at some period of his illness suffers from lithæmia, every lithæmic subject does not by any means suffer from gout.

"In considering the functional disturbances and organic diseases arising from the accumulation of lithic acid in the blood, the questions naturally arise: What is lithic acid? and why this accumulation in the blood?

"In the healthy subject, that great glandular furnace and chemical laboratory, the liver, is capable of transforming any excess of nitrogenized matter which may result from metabolism of tissue or exist in the food consumed, into the highly soluble excrementitious substance known as urea. This excrement is eliminated from the blood with which it has become combined, mainly by the kidneys,

and to a much less extent, by the skin. In certain derangements of the liver, kidneys, and nervous system, but principally of the liver, the nitrogenous waste is not converted into urea but into uric acid, a comparatively insoluble excrementitious and toxic substance. In a perfectly healthy state of the kidneys, this poisonous substance is eliminated with the urine, but in its passage through the urinary tubules, irritation is set up, and if the quantity be large and the irritation long-continued, the function of the renal epithelium is impaired and is not properly eliminated from the system, and consequently accumulates in the blood.

"There are foods which are readily digested, never taxing the most sensitive stomachs and livers, and leaving behind but little waste, which must be gotten rid of in the form of excrementitious matter. Then there are foods, some of them rich in nitrogen, which try the strongest digestive organs and leave behind excrementitious waste which, in its elimination, will severely tax the various organs concerned in its excretion; food, perhaps, which draws so heavily upon the working powers of the assimilative organs as to seriously impair their functions, in time entirely destroying them. The more rational kinds of food which supply all the requirements of the system may be compared to the coal of better quality, the urea and other readily excreted refuse matter remaining, to the fine ashes, which, with ordinary care, never accumulate and never disturb the working of the furnace, until, from the natural effects of age, it is no longer competent to do even ordinary work. But it is a fact, familiar to us all, that too large a quantity, even of good coal at any one time, will clog the furnace and interfere with proper combustion; so will too great a quantity of good and rational food, at any one time, disturb the functions of the liver, stomach and intestinal canal.

"The poorer quality of coal may be likened to food too rich in nitrogen and to irrational articles of diet which disturb the stomach and derange the liver; the refuse matter of the coal, in the form of clinkers, to uric acid which accumulates in the system, by its presence disturbing the functions of all the organs of the body, developing organic diseases in many of them, and permanently injuring, perhaps ruining, the kidneys in their efforts to eliminate it from the system. We have all experimented with such coal in our houses. We have all, time and again, taken such food into our stomachs. It is no

exaggeration to say that nearly, if not all, of the cases of that form of Bright's disease known as chronic interstitial nephritis are caused by the presence in excess, in the blood, of this excrementitious substance known as uric or lithic acid, and that by far the greater number of cases of chronic catarrh of the bladder, in middle and advanced life, and nearly all of the cases of renal and urinary calculi, result from the same cause.

"There is no denying the fact that a large portion of the ills to which man, and woman too, are heir, results from the presence in the blood of an excess of waste material in the form of lithic acid, and that this excess results, in by far the greater number of cases, from actual indiscretion, violation of nature's laws. Many of the so-called cases of neurasthenia — the new name for the fashionable and flattering disease, nervous prostration or exhaustion — are cases of lithæmia which can be cured,—this I know to be a fact,—by proper diet, the avoidance of stimulants and drugs, and a proper amount of physical exercise, and, with some, more brain work, for I believe that brain work is as necessary to some men as is physical exercise to others. It is painful to see in our large towns and cities the number of men and women whose main object in life seems to be to kill time. Instead of their chronic ailments arising from nervous exhaustion or prostration, it is more than probable that they arise from stomach and liver exhaustion. I have had lazy, indolent, and ignorant men and women come to me with a diagnosis of neurasthenia from mental strain, who for years have neither worked brain, legs, or arms, the only muscles they have ever tired by exercise having been the masseter; and yet these patients have accepted from physicians, without cavil, a diagnosis of nervous prostration, and have been pleased and flattered with the thought. So, too, with the highly popular disease, malaria and malarial cachexia. Many of these malarial subjects are suffering from lithæmia, and are cured by the method just mentioned. It is true that malaria cachexia often complicates lithæmia, as it does other diseases, and the periodic aggravations naturally lead to a diagnosis of malaria, but if we regulate the habits and diet of our malarial patients, stop their quinine and restore the function of the liver, or give nature a chance to do it, the system will be brought to a proper level of health, and the malarial poison will be inactive. It is to be remembered that it is not by any means certain that the

periodicity of many of these so-called malarial conditions is owing to the presence of the malarial germ in the system. Malarial diseases are not the only ones characterized by periodic exacerbations.

"Next in the order of importance as a factor in the production of this disease is the too free use of nitrogenous food, the liver under such circumstances being unable to convert the excess into urea. It is true that large quantities of meat have been taken with impunity by many invalids, and even good results have followed; but in these cases, all articles of diet having a tendency to tax or irritate the stomach have been excluded, and several pints of hot water have been taken daily with the diet of meat, and have probably prevented the formation of uric acid or acted as a solvent for it, so that it has not accumulated in the system.

"Then come indiscretions in diet which have a tendency to disturb the stomach, developing chronic catarrh of that organ and dyspepsia, by which substances are generated in the stomach which, by their absorption and passage through the vessels of the liver, poison that organ and disturb its function, so that instead of waste material being converted into urea, uric acid results, which enters the general circulation and is not properly eliminated by the kidneys. It should be noted that authorities now agree that there is an uric-acid secreting function of the kidneys; if the kidneys are injured by the presence of an excess of this material circulating in the blood-vessels of their parenchyma or by other causes, changes take place in the renal epithelium which result in temporary or permanent loss of the uric-acid excreting function. Excessive production, with diminished power on the part of these excretory organs to eliminate uric acid, necessarily results in a permanent accumulation of the poison in the blood.

"The next, and a most potent, factor in the etiology of lithæmia is an indolent, lazy life — even with a diet of mush and milk. For the liver to work properly, exercise of the body — and perhaps of the mind—is imperative; if its function is disturbed, lithæmia necessarily results.

"*Functional Disturbances Resulting from Lithæmia.*—With a toxic element circulating in the fluids of the body, it is hardly to be expected that any of the organs should escape its influences; and a close study of this disease, and a large experience, both in my consul-

tation and general practice, in the investigation and treatment of lithæmia and the organic diseases resulting from it, satisfy me that such is the case. The entire nervous system is affected by the presence of this poison (lithic acid) in the blood. As was before remarked, many of the so-called cases of neurasthenia are cases of lithæmia, and can be cured by eradicating this poison from the blood; and the etiology of many cases of insanity can be cleared up by carefully considering the antecedents of the patients as regards the indiscretions of life and hereditary influences, not with special reference to insanity, but lithæmia, gout, and renal and urinary calculi.

"The digestive organs always suffer, although the lithæmic patient may not be aware of the fact, for in the absence of prominent gastric symptoms, particularly if the bowels are moved daily, he will hardly suspect derangement of the liver function, and that of other organs concerned in digestion and assimilation. Prominent, also, among the functional disturbances arising from lithæmia are derangements of the circulatory and respiratory organs, resulting later in incurable organic disease. The urinary and genital organs in both sexes, in chronic cases of the disease, are rarely exempt from its influences. Renal, bladder, and urethral catarrh I have frequently found in men and women; and loss of virile power, with prostatic enlargement, is a most frequent accompaniment in the male, and in the female, functional disturbances and organic diseases of the generative organs occur, while hemorrhoids are common in both sexes.

"In Fagge's 'Practice of Medicine,' under the head of Hepatic Dyspepsia, may be found Murchison's tabulated arrangement of the prominent symptoms of this disease. Bitter or coppery taste in the mouth, especially in the morning, intestinal hemorrhage, neuralgic pains, feelings of oppression and heaviness, creeping sensations, aching pains in the limbs, lassitude coming on after meals, sometimes accompanied by irresistible drowsiness, severe cramps in the legs and in different parts of the body, headache, characterized by a dull, heavy pain, seated in the forehead, or more rarely in the occiput, giddiness or swimming in the head, particularly when the patient stoops or lays his head upon the pillow, often passing off in the erect posture; tendency to grind the teeth during the waking hours, passing off while the patient is asleep; convulsive attacks, simulating epilepsy, are sometimes due to the same cause; noises in

the ears of various kinds, *muscæ volitantes*, sleeplessness, unquiet dreams, depression of spirits, irritability of temper, palpitations and fluttering of the heart, exaggerated pulsations in the large arteries, irregularity and intermissions of pulse, chronic catarrh of the fauces, chronic bronchitis and spasmodic asthma, pains in the lumbar regions, distension and tightness in the epigastrium after meals, dull aching in the right hypochondrium, and sometimes shooting pains in the same region; sense of weight and fullness below the ribs, often increased by lying on the left side; the hepatic region may even be sensitive to pressure, pain in the right shoulder, sometimes in the left. Often the conjunctivæ have a slight yellow tint, and the skin may even display traces of the same color. The urine is sometimes scanty and high-colored, as it cools depositing large quantities of lithates of bright red color. Again, the urine may be clear, large in quantity, and of low specific gravity. The bowels may be constipated or the patients may be troubled with frequent and semi-fluid discharges. A common and almost one of the most frequent symptoms of chronic lithæmia is a disposition to urinate during the night. It is found, on questioning, that nearly all patients suffering from this disease are obliged to rise during the night once, twice, or even more frequently, to urinate, not because the accumulation is large, but owing, probably, to hyperæsthesia of the sensory nerves of the bladder, and to the irritating quality of the urine and its effects either upon the walls of the bladder or the nerves of the kidneys.

"Among the organic diseases known to result from lithæmia, or what in this connection is the same thing, from high living — indiscreet living — including the long-continued use of alcoholic beverages, even in small quantities, intemperance in eating, sedentary habits, long continued mental strain and worry, may be mentioned first and most common, chronic interstitial nephritis, chronic catarrh and hypertrophy of the walls of the bladder, chronic prostatitis, chronic pyelitis — from the accumulation of lithic acid crystals and the formation of renal calculi in the pelvis of the kidneys — stone in the bladder, atheroma of the arterial walls in the various parts of the body, with its terrible consequences, including hypertrophy of the muscular walls of the heart, although this latter condition can hardly be called a disease, for in every instance it is compensatory, in that it compensates for the narrowing of the calibre of the arte-

rioles resulting from fibroid changes and obstructions owing to atheromatous changes in the walls of the larger vessels, aneurisms, large, small and capillary, the latter particularly in the substance of the brain, which, by their yielding, result in cerebral hemorrhage, the apoplectic attack being sometimes the cause of sudden death, valvular disease of the heart and peri-and endocarditis, fatty degeneration of the heart walls — a most common cause of death in lithæmic subjects—chronic pharyngeal, laryngeal and bronchial catarrh resulting from the latter, pulmonary vesicular emphysema, bronchopneumonia and chronic insterstitial pneumonia or the so-called fibroid phthisis, and finally various chronic diseases of the stomach and intestinal canal, hemorrhoids and fistula in ano. And I am convinced from observation of cases which have been under my own care that many serious organic diseases of the nervous system result from lithæmia. Two cases of progressive locomotor ataxia which I have treated have, in my opinion, resulted alone from this cause.

"In the treatment of lithæmia and the organic diseases resulting from an excess of lithic acid in the blood, we sometimes have to arrive at a diagnosis by exclusion. There is a cause for every morbid condition, and there are habits of life, atmospheric influences and occupations, which give rise to certain diseases and aggravate them if they already exist.

"The first step towards treatment is to make a positive diagnosis, then to see if we can learn the causes of the disease, and to learn whether the life of the patient is such as to permit us to labor untrammelled with our remedies and measures for his relief. Then we should correct the mode of life, if we find need of it, and insist upon the patient aiding us by his own efforts to effect a cure, if a cure be possible, or to arrest the progress of the disease, if it is of an incurable nature, and thus make his life as comfortable as it can be under existing adverse circumstances.

"If a patient consults us suffering from the symptoms given above, or from any of the organic diseases mentioned, we should make careful inquiries to learn if other known causes exist. If we find they do not, on further inquiry we will learn of indiscretions which have given rise to or are aggravating the condition, and a careful examination will lead us to a diagnosis of hepatic disturbance, by which waste material in the blood, instead of being converted into urea,

which is readily eliminated, is by imperfect oxidation converted into lithic or uric acid, and retained in the fluids of the body. The treatment is then simple enough: Correct indiscreet habits of life, lay out a proper course for the patient to pursue, and help nature by the administration of the carefully selected homeopathic remedy. If in doubt as to the special mode of life and diet in an individual case, advise, on general principles, a life and diet which we know to be harmless, as did the pioneers of homeopathy. Professor Small used to say to us in the lecture room: 'Gentlemen, if you are in doubt as to the remedy in an individual case give *sulphur* high. It is a general corrective and can do no harm, and it is more than likely it is just the remedy the patient needs.'"

Treatment. — The same remedies recommended for biliousness, are suitable for lithæmia, not because the two conditions are identical, but because they are similar. One of these conditions may appear alone, but we often find them in the same patient at the same time. There are three things to be brought about in treatment: (1) A regulation of the diet so that digestion may be perfect, and no waste or toxic material carried to the liver. (2) The induction of such activity in the hepatic cells that they will oxidize the lithic acid into urea. (3) Enough physical exercise to aid digestion and the functional activity of the liver. These will be quite fully elaborated when treating of deficiency of bile and biliousness.

The chemical treatment of lithæmia is not favored by the more conservative in our school, but I do not see how it can interfere with the law of similars.

Our specific medicines will certainly act on the system better when the blood and secretions are normal, than when loaded with uric acid and the product of deficient digestion and assimilation.

The use of alkaline waters for the excess of acid need not interfere with the remedial action of our medicines, which have an action deeper and more radical. The selected medicines should correspond to the general condition, not to the condition of the urine alone. We may cause the lithates and uric acid crystals to disappear from the urine, and even render the urine alkaline, but the cause of the lithæmia may remain active and untouched. It is only when the diet, habits, regimen, and other causes have been corrected that medicinal agents act favorably.

The chief ingredients of the alkali or alkaline waters should be sulphate, phosphate, or bicarbonate of sodium; of less value are the salts of potassium, although the citrate of potassium is often useful. When the natural waters cannot be obtained, their salts prepared from them by evaporation — as the powdered Carlsbad salts — are good substitutes. Nearly all the alkaline salts are made granular and effervescent, and are quite palatable. In all cases it is not necessary to give purgative doses, unless the intestines are loaded with mucus and toxic fæcal matters.

Sir Henry Hamilton considers the sulphate of sodium (natrum sulph.) particularly valuable, and he bases his view upon the fact that it purges by exciting elimination from the glandular structures, rather than by increasing peristalsis or osmosis, as is the case with the other saline cathartics. Now in lithæmia, this eliminant action is just what is required. If the patient is gross and plethoric, purgation will be of benefit, but in most cases a slightly laxative effect is all that is necessary. During the first twenty years of my practice I did not prescribe laxative mineral waters or their alkaline salts. When I commenced their use I soon became convinced that in the treatment of gastro-intestinal and hepatic disorders, cures were effected much sooner with than without their aid.

The salts of lithium have been excessively lauded by the profession and advertised ad nauseam by the owners of lithia springs. I have never seen the benefit I expected from the use of lithium waters in the general lithæmic state. They sometimes render the urine less acid, and, if drank freely, lessen the tendency to the formation of uric acid calculi. When the urine is very concentrated, very acid, offensive, and deposits a great quantity of sediment, the benzoate of lithium has acted well.

It is asserted by Haig that salicylate and phosphate of sodium increase the excretion of uric acid in the urine, and also increase it in the blood, withdrawing it from the liver and spleen. He also says that acids and iron interfere with the solubility of the acid and with its elimination. I doubt the correctness of this assertion, for I believe from my observations that fruit acids, and the nitro-muriatic, have the opposite effect. He makes another broad statement which will shock the belief of the friends of lithium—that "though a beautiful solvent of uric acid in a test tube, yet when given to the human

subject by mouth, lithium never reaches the uric acid at all, because it at once forms an insoluble compound with the phosphate of sodium in the blood, thus removing from that fluid one of the natural solvents of uric acid, and diminishing its power of holding uric acid in solution."

However this may be, it warns us to be cautious in allowing lithæmic patients to take large quantities of lithium. The lithiated-potassium, in small doses, is a favorite remedy with many, but it should be cautiously used. Piperazin is a new medicine for which much is claimed in the treatment of lithæmia and gout. Dr. Biesenthal lately stated that all observers agree that piperazin is an absolutely sure remedy in fresh cases of gout, and that even in chronic gout its action almost never fails. The continued use of piperazin, even in small doses (fifteen to forty-five grains in a week), is a sure prophylactic. Further, the remedy has proved of value in all cases of kidney colic, and again in a whole series of cases of hemorrhage from the urinary tract. Bleedings that had lasted for years have entirely ceased under its use. (Berlin Clin. Wochensch.)

The hydrochlorate is preferred, and it is best administered in aërated water. It is said to unite with uric acid in the blood, forming urate of piperazin. This is seven times more soluble than the lithium salt. Piperazin is said to be non-toxic, and not a caustic. The dose is from two to five grains every three or four hours in acute and every six hours in chronic cases. It would seem to be a near analogue of thapsi, according to Dudgeon's estimate of the latter.

Dr. Dowling's favorite remedy in lithæmia was berberis, one of the constituents of the root of hydrastis. It is particularly indicated when the urinary deposits are uric acid crystals, or the amorphous urates, forming a brick dust, or pink sediment; these are the acid sodium urates, and occur when the urine is very acid and of a high specific gravity. Berberis is said to act better when given in infusion.

Thapsi bursa pastoris, according to Dr. Dudgeon, causes uric acid crystals to disappear from the urine in a remarkably short time. The ancients used it for chronic diseases of the liver and especially for passive venous hemorrhages. It may be almost spe-

cific for the hemorrhages occuring from lithæmia, which are always venous and passive.

"Lycopodium," Dr. Hughes says, "I find the very best medicine when the patient is suffering from an excess (?) of lithic acid gravel, and look upon copious sediments of this nature as one of the most unerring indications of its choice in dyspepsia." Dr. Guernsey laid great stress on the symptom "red sand in the urine."

Lycopodium has an undoubted action on the liver. It is indicated in chronic lithæmia, when the disposition to biliousness, dyspepsia, and excess of uric acid has become fixed in the system; Lilienthal recommends it in chronic hepatitis. I never had any notable success with it, until I began to use the mother tincture prepared from the crushed spores. These contain an oil, which is the real medicinal agent. Now I get all the good results Hahnemann's provings led me to expect.

Sepia is another medicine of great value in chronic lithæmia. It acts especially on the portal system, particularly when the disorders of this system occur in women and are connected with diseases of the reproductive organs. Baehr and Meyer both recommend it in lithæmia, and Dr. T. F. Allen's provers all noticed a great increase in the urates in the urine, which was very acid and of high specific gravity. An amorphous whitish or brick-dust sediment was deposited. Dr. Dunham used it in "sub-hepatic congestion with lithiasis" with excellent results.

The Diet Suitable for Lithæmics.—Starchy and saccharine articles of food should be used very sparingly. All meats except lean pork, veal, and beef, may be eaten moderately. Eggs, oysters, and fish are allowed, but not lobsters or crabs in any form. Sweetbread should not be eaten, but acid fruits, raw, or cooked without sugar, are beneficial. Lemonade made with Vichy water, sweetened with saccharin, can be taken ad libitum. Alcohol in any form should be prohibited. Champagne is especially injurious. A good claret is the least injurious. Fresh vegetables may be used. Hot rolls, cakes, hominy, oat meal, pies, and cake are not permissible. Zwiebach, granola, wheat germs, and gluten may be eaten. All fats are beneficial, especially bacon and butter. Milk, diluted with Vichy or seltzer, can be used as a beverage. Black tea moderately, but little or no coffee.

INCREASED SECRETION AND EXPULSION OF BILE.

We may have increased secretion of bile without any decided manifestation of its presence in the stools. A large portion of it may be absorbed, or it may not be secreted in sufficient quantity to irritate the intestines to the extent of causing diarrhœa. When there is sufficient quantity poured into the intestines to cause diarrhœa, the stools are yellow, green, or the various shades of these two colors when mixed in varying proportions. There may be nausea, griping, and the stools, at first normal in color, grow gradually more yellow or green, become more liquid with increased griping, and cause a smarting at the anus.

Children are more subject to this disorder than adults, because the size of the liver is much greater in proportion, and more sensitive to impression. The causes are the overeating of meats, highly seasoned soups and other mixed dishes, or eating too much of even simple food. In health, eating excites temporarily the secretion of bile. If too much is eaten the secretion is abnormally increased. Hot beverages, hot air, and active exercise has the same effect. This disorder commonly occurs during the summer months in temperate regions, and in the tropics all the year around. It rarely occurs unaccompanied by a catarrhal state of the intestinal mucous membrane, and often of the stomach. The same influence that increases the activity of the liver also increases the activity of the glandular elements of the digestive tube. When drugs cause an increased secretion of bile, it has been noted that an intestinal catarrh is generally present.

Treatment. — It has been shown by the experiments narrated, that there are many drugs which have an undoubted influence in increasing directly the secretion of bile. They will all cause the intestinal symptoms mentioned above. There are many more, which have not been experimented with by the methods of Rutherford and others, that are just as potent agents in their action on the hepatic cells.

To ascertain which these medicines are, we naturally turn to such a work as "Bell on Diarrhœa." He gives as causing bilious diarrhœa only twenty-three medicines. Among them we find aloe, colocynth, ipecac, leptandra, and mercurius virus, which we find in Rutherford's list, and other drugs of which it is difficult to conceive

why they are placed under that heading. We turn to the "Color of the Stools," and find under "green," sixty-four medicines; under "yellow," seventy-five medicines, and nearly as many under "black" and "brown." Now why are not all these medicines put under the heading "Bilious"? Probably in a large proportion of the cases of black and brown stools they were of normal consistency. This will show how faulty our repertories are.

When we select a remedy for a condition diagnosed as increased secretion of bile, we must first decide what medicines really have that effect. We know that the drugs mentioned in the experiments quoted have that effect. We have reason to believe from the provings that many others act similarly. Among these may be placed agaricus, chamomilla, chelidonium, carduus, and pulsatilla. There are many among the yellow and green lists that we do not believe have any influence in that direction.

(1) Some of them by their laxative effect cause the expulsion of the bile already in the intestines before it has performed its functions, or before the absorbents have time to take up the residue.

(2) It is well known that many of our provings are so faulty that they contain the records of attacks of illness which could by no possibility belong to the drug proven. Only one example will suffice. In Savery's proving of asclepias tuberosa he took two drops of the tincture, and without repeating the dose recorded all his symptoms for a month (?). On the fifteenth day he had yellow stools with griping, etc., which he recorded as a symptom of that drug. Many of our provings contain symptoms just as worthless.

We must discriminate closely then between trustworthy and genuine symptoms, between those which cause increased secretion and those which cause only expulsion of bile. When we have done this there remain enough to choose from. We must be guided by the concomitant symptoms attending the characteristic one of "abnormal amount of bile in the stools." My personal experience is that mercurius dulcis, euonymin, podophyllum, iris, colocynth, leptandra, rhubarb, chamomilla, pulsatilla, dioscorea, and a few others are most generally indicated. In rare cases unusual medicines are indicated, as croton tiglium, gambogia, etc. In cases like bilious diarrhœa, when the symptoms resemble the primary effects of these drugs, use the 3x dilution of the tincture, or the 6x of the active principle.

One of the best works to consult in this matter is a Repertory now being prepared by A. R. McNaughton, M.D. I insert specimen examples of his method:

COLOCYNTH.

Stool.— Saffron-yellow; frothy; liquid; sour; putrid.

Aggravation.—After eating; after drinking; from fruit; during dentition.

Concomitants.—Intense griping, cutting or squeezing in the intestines. Tongue white or yellow. Bitter taste. Canine hunger. Much thirst. Vomiting of bile. Distention of abdomen, with rumbling. Weakness, paleness, and great prostration after stool. Cutting colic, with great urging before stool, relieved by bending double.

CHAMOMILLA.

Stool.—Chopped, white and yellow mucus; slimy; hot; small; frequent; smelling like bad eggs; yellowish, watery.

Aggravation.— During dentition; after taking cold; after anger; at night.

Concomitants.— Peevishness. Ill humor. Children cry much and are only stilled by being carried about. One cheek red and the other pale. Tongue yellow or white. Bitter, sour taste. Aversion to food. Intense thirst. Sour vomiting. Abdomen hard and distended. Moaning in sleep. Sticky sweat on forehead.

PODOPHYLLUM.

Stool.—Greenish; watery; profuse; gushing; painless.

Aggravation.— In morning; at night; during hot weather; after milk and acid fruit together; after eating and drinking; during dentition.

Concomitants.—Prolapsus ani. Exhaustion. Rolling of the head during dentition. Tongue coated yellowish or white. Loss of appetite. Desire for acids. Gagging or empty retching. Violent cramps of the calves, feet, and thighs.

MERCURIUS.

Stool.— Dark green; bilious; frothy; watery with greenish scum floating on the surface of the water; mucous; slimy; scanty; corrosive; sour smelling.

Aggravation.— From cool evening air; at night; in hot weather; during dentition; in cold damp weather.

Concomitants.— Violent tenesmus and continued urging. Prolapsus recti. Face pale. Tongue swollen showing imprint of teeth on edges. Profuse salivation. Offensive breath. Perspiration on the least exertion. Offensive or sour-smelling night-sweat.

Diet and Regimen.— The patient with excessive secretion of bile should keep his body cool, drink cool drinks, eat no meat or fats, but farinaceous foods well cooked, with tea or skimmed milk, and fish or young chicken. When there is excessive expulsion of bile the symptoms are sudden diarrhœa after the expulsion, or even before, of the fæcal matters, the stools become profuse, with severe griping. Sometimes nausea and vomiting of bile attend it. This affection may arise from a sudden catarrh of the bowels, from

fright, a chill while overheated, or the rapid fermentation of food. Or it may be caused by the sudden discharge of an overloaded gall-bladder, the duct having been closed by catarrh, spasm, or a gall-stone. Usually the diarrhœa subsides spontaneously when it arises from the latter cause. The remedies best indicated in this form of the disorder are gambogia, croton tiglium, colocynth, iris versicolor, cinchona, podophyllum, and others selected according to the special indications.

Dr. Goode, in writing of Headache, mentions a peculiarly severe variety of bilious headache, which suddenly terminates, "as soon as the patient feels as if something gave way in the region of the liver, followed almost immediately by a violent diarrhœa of almost pure bile." This is an example of the form of bilious diarrhœa above mentioned.

Some authors mentioned another disorder under the name of "Secretion of vitiated bile." But the latest investigations into the composition of the bile show that it is always aseptic, and never becomes vitiated unless during the progress of some malignant fevers or in infective jaundice.

BILIOUSNESS.

Deficient Secretion and Excretion of Bile.— The term bilious, which is now ignored by scientific pathologists, has fixed itself so deeply in the minds of both physicians and laymen, that a work on diseases of the liver cannot be written without some recognition of it. Biliousness is not a disease of itself, but is made up of three conditions generally present in greater or less degree in nearly all cases.

Gastric Catarrh.—This condition has been treated of in another chapter. In acute cases the hepatic complication is not always present, but in chronic gastric catarrh the functions of the liver are always interfered with. Unless there is an irritative catarrhal condition of the duodenum, the condition of the liver is one of functional torpor. The hepatic cells do not do their proper work in destroying albuminoid matter and the elimination of urea; or if the catarrhal affection has invaded the ducts, the excretion of bile is mechanically prevented. In such cases the bile is absorbed into the blood and poisons nearly every organ of the body. There is but a

short space between jaundice and a severe attack of biliousness, for in nearly all cases of temporary deficiency of bile there is a slight icteric hue of the skin — the "muddy," sallow discoloration so well known to physicians.

The typical symptoms of an attack of "biliousness" are headache, occipital or frontal, drowsiness during the day, and heavy sleep at night, or sleeplessness; the patient is melancholy, morose, and irritable, there is nauseating phlegm in the fauces, and disgust for food, or a sensation of sinking in the stomach which impels one to eat; or a heaviness in the stomach as of a "load" there. After eating there is headache, sour eructations, pyrosis, water-brash, and drowsiness with flushed face. On waking in the morning the patient does not feel rested, there is a bitter or metallic taste on the tongue which is coated yellow or brown. The abdomen feels distended, the clothing feels tight when it is not. The bowels are sluggish, and the stools are hard, lumpy, blackish, or gray; the urine may be pale, — or dark with high specific gravity.

Nearly all these symptoms may be also seen in lithæmia and gastric catarrh.

Having considered Lithæmia in a previous chapter, I will give my experience as to the various medicaments for biliousness or deficient secretion and excretion of bile, together with the hygiene and diet most suitable to aid in removing that condition.

Those medicines which in large doses cause an abnormal increased secretion and excretion of bile are indicated in biliousness, for the reason that the opposite condition is the result of their secondary action. This is according to the law of similia. The dose should be so small that no reaction or secondary symptoms will follow.

Mercury in some form has been considered the chief remedy for biliousness. It is or has been generally prescribed in large doses, five to ten grains of calomel, or three to five grains of blue mass. But the tendency in the regular school is now constantly towards smaller and repeated doses, for as their best and most recent authorities express it, large doses, while they seem to relieve promptly, are followed by increased torpor of the hepatic functions, and the liver becomes less and less susceptible to its influence.

The two best preparations of mercury for the bilious state, described above, are undoubtedly mercurius dulcis (calomel), and

mercurius vivus, or "*massa hydrargari*" (blue mass). Blue mass is a trituration of mercurius vivus with conserve of roses, the mercury forming one-third of the mass. When the symptoms mentioned above are present — and they can all be found under mercurius — the 2x or 3x trituration, in doses of three to five grains repeated every three hours, will soon dissipate all the symptoms. There are some exceptions to this, namely: when the patient has been in the habit of taking larger doses of mercury or other cholagogue drugs, and his liver is torpid from over-stimulation; then if mercury is better indicated than any other medicine the dose may be increased to a few grains of the 1x. I know not why it is so, but I have met many instances where no other apparently indicated medicine had any decided influence over the condition, which was not removed until one or two grains of blue mass were given at bedtime, and followed the next morning with a laxative dose of Congress or Rubinat water, or a seidlitz powder. The axiom of some of our school, that if the lower attenuations do not act well we must go higher, is not true in hepatic torpor, however it may be in more sensitive organs. This is also the opinion of Dr. W. H. Holcombe, of New Orleans.

Ox-gall is next to mercury in its efficacy, for not only does it somehow increase the functional activity of the hepatic cells, but it supplies bile to the intestines, when in biliousness the bile is deficient. It is particularly indicated when the bowels are sluggish, the stools gray or dry and hard. One grain before each meal and at night is sufficient. They are prepared in pills, sugar-coated.

Euonymin is perhaps the most certain and satisfactory of all. It is not an irritant to the stomach, duodenum, or intestines. It is indicated in deficient secretion, with gastric catarrh and lithæmia; also in the decided indigestion which obtains in the stomach and intestines. Intense, heavy, wearing occipital headache is the chief characteristic symptom. The bowels, neither loose or constipated, are generally regular, but the stools are usually deficient in bile. After the administration of one-grain doses of the 1x or 3x trituration three or four times a day, the headache and anorexia will leave; the stools become yellow, and often large quantities of yellow mucus will pass the bowels.

Leptandrin has a sphere of action peculiarly its own. It causes in large doses alvine discharges of a black, tarry substance, and when

given in disease, the discharge of this matter is usually followed by improvement. The same fact has been observed after the administration of mercury, especially mercurius dulcis. It was once supposed that this black, tarry material came from the gall-bladder and was a thickened, vitiated bile. This may be true in some cases, as when the gall-duct has been obstructed, but this black substance is generally formed in the colon. The ancients associated the presence of this substance with melancholy and a desire for death, and such is frequently the case. Dr. Henry Holland, in his "Memoirs," mentions this condition, and observes that the liver may not be the cause of this secretion. Certain it is that it is a poisonous product, probably of decomposition of food, or secretion of the colon, and its retention causes very serious symptoms, mental and cerebral. Leptandra may possibly cause a morbid condition favorable to the formation of this product, or it may simply have the power of expelling it when present. I should consider it indicated, and give the 1x, several grains every three or four hours in case of melancholia with indifference to life, when met with in biliousness, and I have given the 2x when the stools were black and "tarry," with excellent results. These black stools indicating mercurius and leptandrin should not be mistaken for the black stools composed of disorganized blood, occurring in hemorrhage from the veins of the portal system; but even in this case leptandra may be useful.

Iris versicolor and its active principle, iridin, was a valued medicine among the aborigines of this country. It was considered by them the best of all "spring medicines." A decoction was made of the roots and drank until it vomited and purged. It was used much as veratrum album was used by the ancient Greeks. Our native Indians drank it before going to war, or engaging in athletic sports, in order "to clear the brain and the stomach from morbid matters." In large doses it causes an increased flow of thin, yellow bile, with vomiting of bile and diarrhœa of the same. When these primary effects are over the liver becomes torpid and secretes less than normal, and as a result the secretions of the stomach and intestines become acid and irritating, with indigestion and severe frontal headache, attended by nausea and vomiting. In this it resembles pulsatilla and rheum, except that the latter does not cause headache to the same extent. Its secondary symptoms make it indicated for the

so-called bilious and acid sick-headache. The pain in the head is over the eyes and in the temples. It is often difficult to differentiate between the biliousness and sick-headache of iris and pulsatilla. The lower attenuations for the secondary symptoms act best; for the primary bilious diarrhœa and vomiting, the sixth is often found promptly curative.

Sanguinaria and chelidonium are excellent remedies for biliousness. Belonging to the same botanical family, they have the same constituent active principles — sanguinarin and chelidonin. The headache of sanguinaria begins in the occiput, ascending from the nape of the neck along the right side of the head to the right eye; the pains shoot from the occiput through to the ears, or commence in the temples and extend to the right eyes, and are periodical. There is nausea, with congestion of the liver, pains under right clavicle, portal congestion, tongue feels as if scalded, bitter taste, aggravated by the slightest noise, stooping or motion. The biliousness of sanguinaria is often caused by a catarrhal state beginning in the head, extending to the stomach and bronchi, and ending in diarrhœa which relieves all the symptoms. The gastric catarrh is attended by burning in the throat and stomach — a kind of pyrosis. The biliousness of chelidonium is very similar. There is some congestion of the liver and portal system. The headache is also in the occiput and extends along the right side of the head to the eye; it is periodical and may be exaggerated at 11 A. M. The vomiting is rare, but there is nausea, the tongue is narrow and pointed, the taste bitter. There are severe stitches in the liver, at the right scapular region. Both drugs cause increased flow of yellow bile, but chelidonium seems the most active hepatic stimulant. When the secretion of bile is suppressed, ten to fifteen drops every four hours of the tincture will restore it, and relieve the head and gastric symptoms. In bilious diarrhœa, the 3x dilution is sufficient. Both are useful when the hepatic torpor seems to affect the right lung, causing cough and some expectoration. They are useful in the so-called bilious pneumonia.

Chionanthus, an indigenous remedy, resembles euonymus and leptandra. It is not an active purgative, but it seems to cause a mild stimulation of the hepatic cells. Like leptandra and calomel it expels the black, tarry, secretion from the colon. It has lately been found

of value in bilious sick-headache, with yellow coated tongue, nausea, and complete anorexia. Nux vomica is a favorite remedy for biliousness. It is now used by both schools, and probably when not really indicated. It is not a cholagogue, for according to Rutherford it arrests the secretion of bile when given in large doses. If so, it must act on the nerves supplying the cells as a paralyzer, or it may act by causing contraction of the hepatic ducts. The bilious symptoms of nux vomica are familar to all; the dull, stupid headache with vertigo, yellow tongue coated at the base, dry mouth and fauces, heartburn, water-brash, bitter, foul taste, bitter eructations, weight and oppression in the stomach, constipation with frequent desire for stools, or scanty watery diarrhœa; moroseness and irritable temper — all point to a torpid condition of the secreting cells of the liver, a gastric catarrh, and lithæmia. When the above leading symptoms are present nux vomica, 1x to 6x according to the sensitiveness of the patient to its action, will remove all in a few days. Should these symptoms be brought on, as they sometimes are, by anger or vexation, chamomilla in appreciable doses of the tincture will soon remove them. It is an excellent remedy for the biliousness of nervous, irritable women and children.

Bryonia has a reputation equal to nux vomica, but the conditions differ. The biliousness of bryonia is like that found in rheumatic subjects, and occurs generally during the damp and cold or damp and hot months. I have found it particularly useful when it occurs after an attack of profuse diarrhœa, or after active purgation from drugs. Aloe is one of our best remedies for a bilious state, when torpor of the portal system is the chief pathological condition. This means passive congestion of the liver and hemorrhoidal vessels. There is a feeling of distension in the hepatic region and abdomen, a bitter taste, a sickly, sallow face, and some jaundice. These are secondary symptoms and require doses of one-hundredth to one-tenth of a grain, repeated three or four times a day. The action of aloe has not been fully understood by any school. Primarily, according to Rutherford and other experimenters, it causes a profuse flow of green bile, with large but not thin evacuations, yellow, green, or greenish brown, with bloody mucus of a strong odor of bile, and burning in the rectum. The secondary symptoms follow soon after. The active congestion of the liver and portal system is followed by

a passive stagnation of the circulation in the liver and whole venous system, resulting in a typical bilious hemorrhoidal state. The fear that material doses of aloe will cause an aggravation is unfounded. If we are treating symptoms similar to its primary effect there are grounds for this fear of aggravation; no one would dare to prescribe larger doses than the 3x trituration in such acute irritation of the liver and intestinal canal. But when the secretions of the liver are locked up, the portal and hemorrhoidal veins engorged, and the circulation sluggish, the dose must be large enough to arouse a functional activity without causing primary effects. The biliousness simulating that of aloe is unusually met with in men and women past the middle age — at the "change of life" — for both sexes change. In such the venous blood is far in excess of the arterial. I have found that in order to remove the intestinal torpor, the obstinate constipation, the swollen hemorrhoids, the passive congestion of the head, liver, and in fact, all the organs, the dose of aloe should be one-fourth to one-tenth grain; or of aloin, from the one-tenth to the one-hundredth. These doses repeated every four or six hours will in a few days effect a complete change in the abnormal state of the patient. I have never seen the slightest aggravation from such doses of aloe. Dr. Tilt, in his admirable work on the "Change of Life in Women," goes further, and advises laxative doses (one or two grains of aloe every night), declaring that he has cured old, obstinate hemorrhoids, with portal congestion, cerebral congestion, and obstinate biliousness, with such doses, and asserts that he never observed any aggravation from its use if the medicine was suspended when improvement was obtained.

Carduus closely resembles aloe. It stands between that drug and hamamelis in its action on the veins. We know but little of the general physiological effects of hamamelis. It may act on the liver and portal system as it does on the veins of the rectum and the lower extremities for aught we know. Carduus acts upon the circulation in the liver and portal system, as we do know. (Hamamelis acts upon the veins in other portions of the body.) It also acts similarly to chelidonium, sanguinaria, chionanthus, and euonymin. During the grippe, I found it specific for the bilious, gastric state resulting from that disease. It was used in Germany many years ago for the "gastric catarrhal condition attending epidemic influenza."

A common symptom of biliousness, and one that created some alarm to the patient, and is often misunderstood by the physician, is a slowness and irregular intermittance of the heart's action and pulse. Some experiments made by Rohrig ("Archiv. fur Heilkunde," 1863, p. 385) showed that the bile acids paralyzes the heart and retard its action, while bile pigment has no such effect. The bile acids according to Legg act on the ganglia of the heart (not through the pneumogastric), causing slow intermitting pulse, and finally increases the blood-pressure. Murchison, commenting on this says, "It is possible, then, that the slowness and intermittence of the pulse may be caused by the presence in the blood of the unchanged bile acids, even in cases where there is no jaundice; but more probably the cause of the intermission is some other product of albuminous disintegration, inasmuch as it is so commonly met with in connection with lithæmia or gout, and as it is entirely removed by blue pills, saline aperients, alkalies, and attention to diet. A notable fact in these cases is that the tendency of the pulse to intermit is usually greatest when the patient is at rest, and diminishes or ceases on taking exercise." This is a valuable diagnostic sign. I have observed it frequently in my own person, and in many of my patients. If you are in doubt whether the heart or liver is to blame, ask your patient to walk briskly for a minute. If the intermittence is hepatic it will apparently disappear. Connected with this slowness and intermittence there is sometimes vertigo and palpitation.

In selecting the remedy for this condition, if the heart is not weakened by its long continuance, some hepatic remedy must be used. The medicines which correspond to this condition are mercury, euonymin, podophyllin, and nitro-muriatic acid. These drugs by their secondary action so paralyze the hepatic cells that they cease to excrete the bile acids. These acids are not secreted from the blood, says Legg, in his great work on "The Bile," but are manufactured in the liver; but when the liver fails to excrete them they with other bile constituents get into the blood and poison it. The medicines above mentioned favor the excretion of the bile acids when given in doses sufficient to cause their normal physiological action—not their pathogenetic. It should be remembered that any weakness of the heart, functional or structural, resulting in decreased blood-pressure, will lower the activity of the hepatic cells. This will prevent the

cells from secreting normal bile, and the destruction of the toxic products carried to them. When this condition obtains, medicines which increase the tonicity of the heart may alone remove the biliousness and lithæmia. But if the liver was the first to be deranged, and the cardiac weakness was a result, then both hepatic and cardiac remedies should be used.

Mercury is the most effective; I have tested it thoroughly in my own case and others. When there are the general symptoms of biliousness, headache, foul breath, yellow tongue, loss of appetite, pyrosis, excess of mucus in the fauces and stomach, and constipation, and I observe on sitting down or lying that the heart intermits, and beats slower than usual, then I know there is deficient elimination of bile acids. I usually try first small doses, one-hundredth or one-thousandth grain of mercurius, podophyllin, or euonymin, which will generally remove the symptoms in a few days, but they sometimes fail, and larger doses are required. In my own case and a few others I am obliged to resort to one grain of blue mass taken at night, followed in the morning by a laxative of Rubinat or Congress water. A curious fact is, that sometimes this fails, when a pill compounded of blue mass one grain, with podophyllin one-fourth grain, will bring about the desired result. After this pill no laxative is needed, for the podophyllin will carry off the contents of the bowels sufficiently. Before you give material doses of mercury ask your patient if he has ever been salivated by abuse of the drug. If not, any single dose will not salivate; but if he has, even the 8x may salivate. A case is on record of a person, previously poisoned by this drug, salivated by mercurius corrosivus 30th.

Podophyllin has in its pathogenesis all the cardiac symptoms usually caused by biliousness. It is chiefly indicated, also, by the presence of piles, constipation, distension of the bowels, and colon-flatulence. Give the 8x, and if no improvement is observed in a few days the 2x. As in using mercury, you may, in torpid subjects, be obliged to resort to the 1x, two or three grains at night.

Euonymin in large doses is a cardiac poison, according to German experimenters. I have never seen their experiments, and cannot decide whether it is a direct or indirect poison. But I know it is an efficient remedy in cardiac disturbance, in inaction of the excreting functions of the liver. It should be prescribed as directed for

podophyllin, but it is a less active medicine, and in case a physiological dose is required, one grain at night is necessary. It is not laxative in this quantity, and a dose of aperient salts should be taken the next morning.

Nitro-muriatic acid has for a long time held a prominent place among the hepatic remedies. It is not indicated in acute cases when the liver and stomach is deranged from overeating or exposure to catarrhal miasm, but is more adapted to the hepatic torpor and gastric catarrh common in hot and damp climates, and aggravated by meat-eating, and the use of alcohol. In India and England it is most highly valued in chronic cases. It is well known that nitric acid is a close analogue of mercury, causing a similar action on the gastric and hepatic glandular elements. The union of the two acids seems to modify the action of both. Muriatic acid has no known action on the liver, but it has a decided tonic action on the glands of the stomach and intestines, and is one of the most important constituents of the gastric juice. Our provings of nitro-muriatic acid are of little importance, and give no clue to the valuable clinical results obtained from its use. H. C. Wood says that in large doses it causes "violent bilious diarrhœa," which shows that it is secondarily indicated in hepatic torpor. I have used it extensively and no medicine gives me better satisfaction.

The testimony of Dr. Scott, of Bombay, and Prof. H. C. Wood substantiates my high estimation. They say, "In the chronic hepatitis of hot climates it has been used with great success by Annesley, Martin, and other famous India surgeons. The remedy would seem not to be indicated in hepatitis with high fever and a tendency to rapid suppuration, so much as in the slower form of the affection, which normally ends in chronic enlargement and induration of the viscus. In the habitual congestion of the liver occasionally seen in this climate I have used it with the most marked benefit. In the still milder affection known as 'biliousness,' the pathology of which is probably a torpid condition of the small glands of the alimentary mucous membrane as well as of the liver, nitro-muriatic acid has yielded in my hands most excellent results. That the remedy does act upon the liver is proved by the fact that in these cases it sometimes produces violent bilious diarrhœa. When jaundice depends upon obstruction, or upon any of the severer organic diseases of the

liver, the acid is of little if any use; when, however, the jaundice depends upon the torpor of the liver, or even when it is catarrhal in origin, the remedy may be of great service. Even in the early stages of cirrhosis, while the liver is still enlarged, nitro-muriatic acid should be tried, as in some cases apparently of this character great benefit has been derived from its use." In those forms of chronic diarrhœa in which the disease is really an intestinal dyspepsia, nitro-muriatic acid may be of the utmost service, benefiting and even curing cases that have resisted other treatment. As the effect of the acid is not a sudden one, it is evident that it acts in these cases not as an astringent, but by restoring the normal digestive power. There is a morbid condition, probably dependent upon defective primary assimilation, in which the chief symptoms are general malaise, a feeling of weakness, a lack of elasticity, and a very great depression of spirits, in which crystals of oxalate of lime are generally to be found in the urine, and in which nitro-muriatic acid produces in a few days a surprising revolution."

Rutherford's experiments show it to be a true cholagogue. This preparation should be made as follows: mix three parts of nitric acid with five parts of hydrochloric (muriatic) acid in an open measuring glass, adding them together slowly. An irritating vapor will arise. When this has ceased put the mixture into a dark glass bottle. When prescribed make the 1x dilution with distilled water. The dose is ten to thirty drops in a wine-glass of water, and may be taken through a straw or glass tube if the teeth are sensitive to its action. This dose should be taken before each meal. If nux vomica is indicated give a dose of that medicine after meals. With these two medicines, aided sometimes by a dose of pepsin with the meals, I have cured many cases of intractable bilious dyspepsia.

The following medicines should be consulted as they may all be indicated: agaricus, baptisia, æsculus, eupatorium perfoliatum, ipecac, phytolacca, juglandin, and hydrastin.

Dujardin-Beaumetz values phytolacca highly. Hydrastin we know is almost specific for chronic catarrh of the stomach, with indigestion. When hepatic torpor is added this remedy is doubly indicated.

Mineral Waters. — Many cases of chronic biliousness, lithæmia, and gastric catarrh will not improve while the patients are at home and

attending to their vocations. They will not conform to the proper dietary rules. Such patients derive great benefit from a visit to mineral springs containing sulphate of sodium, phosphate of sodium, and chloride of potassium. These salts, according to Rutherford, cause in dogs an increase of the secretion and excretion of bile; sulphated magnesium (Epsom salts), on the contrary, caused a decrease.

Many springs of Europe which have a reputation in this condition under consideration contain all of the above salts. The springs of Carlsbad have the greatest popularity. Carlsbad salts in powder form is now considered the best. It contains the most important ingredients of the natural water, and can be taken in teaspoonful doses dissolved in hot or cold water one-half hour before breakfast. Marienbad, Pullna, Rubinat, Vichy, and some of the Hungarian springs are held in high esteem. Hungarian water contains too much sulphate of magnesium, and I have never seen as good effects from it. The United States of America abounds in mineral springs, every state in the Union possessing valuable waters. Those which are advertised with the most fulsome praises are the least valuable. Many of the latter have no other merit than that they are pure; the mineral salts in them being very minute in quantity. We have none that quite equals Carlsbad, Rubinat, Pullna, Vichy, or Seltzer. But we have many of a similar character, such as the Hathorn, Vichy, and Carlsbad, of Saratoga; the springs of Michigan and Indiana, and the numerous springs of sulpho-saline waters in Virginia and Pennsylvania. California, Arizona, Colorado, and all the far western states abound in springs possessing valuable medicinal qualities.

It is not generally known that in 1886 our government published a list of the mineral springs of the United States, with their analyses, made by competent chemists. This can be obtained from the government printing office for a nominal amount.

All salts above mentioned are indicated by the law of similia. We have provings of nearly all of them. These provings and Rutherford's experiments show that they primarily irritate and stimulate the functions of the hepatic cells, and produce a catarrhal state of the stomach, bowels, and gall-duct if taken in massive doses. When these primary symptoms are present in a patient (*e. g.*, the bilious diarrhœa of phosphate of sodium) the 3d and possibly the 6th attenuation will act curatively. But if the opposite condition obtains,

deficiency of bile with acidity of all the secretions, it must be given in large doses — twenty to thirty grains after meals. I have tested the 6th for this condition in children, but never found it to be of benefit.

I will add, *en passant*, that I do not accept the doctrines of Schuessler. It is not homeopathy, and I doubt if it be scientific. If Hahnemann were alive he would doubtless denounce it, as he did the chemico-therapeutics of his day. Any benefit accruing from their use is based on the fact that they act according to the law of similia. When prescribed for their secondary action, namely: jaundice, hepatic torpor, enlargement of the liver, and chronic gastric catarrh, material quantities, such as are found in the natural waters, are necessary to bring about a cure. But the use of these waters must not be carried beyond the physiological limits. The physicians of both schools at the springs of Europe, after examining patients, prescribe the quantity to be drank during twenty-four hours, and watch the effects as we do the action of drugs. Patients are not allowed, as they are in this country, to drink medicinal waters at their pleasure. The diet, regimen, exercise, and habits are all regulated by the medical adviser. This aids the cure, and is equally as important as the water.

Exercise is of great benefit to sufferers from chronic biliousness and lithæmia. The victims are generally those who lead a sedentary life, do not exercise their muscles, breathe shallowly, and eat too much. Such patients should be made to walk over hills if possible, ride on horseback, breathe deeply (which increases the functional activity of the liver) use dumb-bells, Indian clubs, hunt in the woods, and walk to their business instead of riding. In chronic cases a free, constant open-air life, in the country by the sea, or on the hills where an abundance of oxygen can be taken into the system, is absolutely necessary to a cure.

Diet.— The amount of food taken into the system should be no more than equal to its demands. All bilious patients eat too much. The advice of Dr. Bence Jones is very applicable: "A minimum of albumin in our food should be taken in order to produce the least uric acid; and a minimum of carbonaceous food, in order to allow the uric acid to be oxydized as much as possible."

Dr. Fothergill gives in a very practical way the following advice

relating to diet. After explaining the nature of the condition known as biliousness, he says:

"With bilious persons it is well to reduce the amount of food taken to the body needs, or as near this as can be attained. And especially is the moderation to be practiced as regard those nitrogenized elements of our food from which, obviously, the bile acids are derived. Bilious persons, then, should avoid the solid joint at meals. Joints, chops, and steaks, indeed lean meat in every form, must be taken in very small quantities, if at all. Fish, as a less concentrated form of albuminoid material, is to be preferred to flesh. Vegetables should be largely eaten. Fruits do not disagree. Eggs and milk have an evil reputation for encouraging biliousness. Fatty and sugary matters are reputed to be bilious; but if this be so (and the view has a basis of fact) it must be indirectly and not directly. If the readily oxidizable hydro-carbons attract the oxygen of the body, the less oxidizable albuminoids will be left over, the ashes or cinders of the body-combustion. Farinaceous matters and vegetables should form the staple dietary, accompanied by a certain amount of fat; the amount varying with the season, climate and locality. In temperate climates a certain amount of the concentrated fuel food, the hydro-carbons, may be required. In tropical countries the dietary consists of carbo-hydrates only, with advantage. The gastronomic proclivities may, however, go in another direction but reason must be brought to bear upon them. The bilious person should avoid the eggs in the traditional breakfast bacon and eggs, taking the fat of the bacon by preference. Then if there should be any fish, some of it should be eaten. In summer some lettuce or salad should be added; in winter some fruit, especially the apple. There exists no real objection to some cream and sugar being added to the tea and coffee. Then the lunch should consist of some soup or fish with well mashed potatoes or other vegetable, and 'pulled bread' or biscuits. Dinner should consist of some fish or chicken, a vegetable course, milk pudding, and biscuit and butter. Such was the dietary on which a gentleman whose liver gave him much trouble got well, after being under several physicians of repute without avail. On his usual dietary, which embraced a considerable quantity of lean meat, he grew worse and lost flesh. This is a common story. When the liver cannot carry on the proper metabolism

of proteids into the serum-albumen of the liquor sanguinis, but breaks them down into bile acids or urine solids, the tissues go unfed. In fact the albuminoids consumed 'go to feed the disease and not the patient,' to use an old-fashioned and time-honored expression now getting lost sight of too much. Of course it is well to raise the tone of the liver by resort to hepatic stimulants at the same time. But by reducing the demand upon the liver as regards its function of dealing with albuminoids it can perform its work, and normal metabolism goes on. The consequence is the body is once more fed and the biliousness is relieved, *i. e.*, the proteid matter is going to its wonted destination, the tissues, and less bile acids are formed.

"Recently a well-known writer of fiction came under my care with a tongue covered with a thick fur deeply stained with bile, and lithates in her urine. She too had been losing flesh and getting worse on a meat dietary with some alcohol, the proper dietetic means to get strong in popular belief. She adopted my suggestion, with quick and prompt relief, and got well most satisfactorily. When the liver is out of order the ordinary dietetic means for getting strong are rather mischievous than useful. It is not what is swallowed but what is digested that is the question. Primary digestion goes on in the alimentary canal, and secondary digestion or elaboration is performed by the liver. Food may be taken and digested, but if the elaborating action is defective, nutrition fails, just as much as if food were withheld in the first place. When the body is starving from liver inadequacy, to force down liberal quantities of generous food is to overtax the liver and to hamper its action still further. Food rich in carbon-hydrates, and containing but a small proportion of albuminoids, is that which is really indicated and required. The appetite may be feeble and capricious, the palate may be dainty and have its preferences; these may be met, but after all the function of the liver must be remembered; and with it the true body-needs.

"This is all rank heresy in the opinion of the people at large. When a person is below par, plenty of animal food and good wine, tonics with iron, are the things to get him up certainly in most cases; but when the liver is involved there is an error in the equation. So long as the liver is competent to its work, so long the equation is correct; but when the liver is unequal to its work this regimen but

further embarrasses it. The number of stories told one of the failure of this plan to get strong, by different patients, is conclusive. A number, too, furnish some curious corroborative testimony. They bring a specimen of urine for examination in a bottle; and not infrequently the bottle has on it in raised letters 'Quinine and Iron Wine.' It has signally failed in their cases. A look at the tongue and a few well-directed questions soon lighten the matter up; and on a different regimen, dietetic and medicinal, improvement sets in. But these persons are often hard to convince. At first sight it does seem an odd way to increase the strength, viz., cutting down the food, and especially the animal food. But the alteration is soon felt. 'She stoops to conquer.' And this manœuvre can be practiced with satisfactory results in hepatic inadequacy. No chain is stronger than its weakest link. The appetite may be fair, the stomach capable; but the liver is weak. The nutrition is defective usually when the liver is incapable, and the appetite fails. That is nature's way of attaining a new balance by 'leveling down.' But an appetite is held to be a man's inalienable right; and so he tries artificial means to create one. He defeats his own ends. He thwarts and traverses nature's provisions, and so the plan fails. When the liver is incapable it is well to reduce the demands upon it to its capacities.

"Now about the drink. A naturally feeble liver cannot get on with malt liquors. Whether it is cholæmia or lithæmia, malt liquor is pernicious; especially with persons of the 'Arab' type, *i. e.*, highly developed nervous system and small viscera. Malt liquors prepared by the English system of brewing are specially injurious to an incapable or sensitive liver. The beers brewed upon the German or lager system are less objectionable; and many 'liverish' persons can drink beer on the continent who cannot touch it in England. Generous wines, too, have an evil influence. The wine must be poor for most bilious persons. Often even wines must be foresworn and some weak spirits-and-water form the sole beverage or food adjunct."

CONGESTION OF THE LIVER.

Active Hyperæmia.—This occurs physiologically after each meal; but if a person eats too much, and of high-seasoned and stimulating food, taking with it a large quantity of wine or spirits, the conges-

tion becomes pathological. This hyperæmia, if frequently recurring, leads to functional disorder. Gastro-intestinal inflammations have the same effect. Bouchard says dilatation of the stomach is always attended by hyperæmia of the liver, due to the passage into it of toxic substances, the result of imperfect digestion. Suppression of the menses or a hemorrhoidal flux may induce it. It is of frequent occurrence at the "change of life."

Climatic influences have much to do with hepatic congestion. In certain zones, and in certain temperatures, as in the torrid zone and in a hot and moist climate, few persons escape. It occurs during malarial fevers. Malaria, even if it does not cause ague, often excites congestion as a primary state. The symptoms are a decided increase in the size of the liver; pain in the hepatic region encircling the base of the thorax like a girdle, and causing a sensation as if the clothing was too tight, or as if the stomach was too full. Then there are pains which radiate into neighboring parts, particularly the shoulder of the right side, or under the right scapula. Monnerat says these congestions are accompanied by fever with paroxysms coming on every afternoon between 4 and 5 o'clock. (I have frequently observed this in malarious districts. The routine practitioner thoughtlessly gives quinine, which only increases the congestion and causes hepatitis. The only proper treatment is to remove the congestion by the use of aconite, gelsemium, or mercurius, and some alkaline water like Congress, Carlsbad, or the phosphate of sodium.)

With congestion of the liver we find dyspnœa, without any cardiac trouble; or, sometimes dyspnœa with intermitting pulse, simulating disease of the heart. If we find these symptoms we should always carefully examine the heart. If that is found intact, we can safely diagnose hepatic hyperæmia.

Treatment.—In acute congestions from overeating, or the excessive use of wine, or from becoming overheated, all that is necessary is a low diet of milk and rice gruel, or some such farinaceous food for a few days. If it is the result of chronic gluttony, little can be done except to order an aloin pill at night, with a dose of Rubinat or Carlsbad in the morning to carry off the surplus food and empty the portal system. Unless such patients change their habits and eat rationally, they sooner or later die of Bright's disease or apoplexy.

Simple congestion is relieved by such medicines as mercurius dulcis or vivus, podophyllin, or any of the hepatic remedies heretofore mentioned, which are indicated by the symptoms. I prefer mercurius dulcis, of which I prescribe tablets of one-tenth of a grain before each meal and at night. Two days are sufficient to remove the hyperæmia.

If the patient is constipated and the mercurius does not move the bowels, give in the morning before breakfast a teaspoonful of powdered Carlsbad salts in a glass of hot water. When there is a remittent fever with the congestion, gelsemium, lycopodium, bryonia, chelidonium, sanguinaria, and carduus will be found useful. When the kidneys are obstructed and not able to carry off the effete matters that the liver has not been able to destroy or eliminate, eucalyptus and boldo will be found excellent remedies in doses of five to ten drops of the tincture every four to six hours. In very plethoric subjects I have often seen notable benefit from veratrum viride.

Passive Hyperæmia presents nearly the same train of symptoms as the active, but the causes are usually not the same. Chronic passive congestion may result from gluttony and alcoholism, but the usual cause is venous stasis in the right heart. This occurs in all mitral diseases, inducing venous stasis in the efferent vessels or sublobular branches of the hepatic veins.

Emphysema of the lungs and inter-thoracic tumors may have the same result as valvular diseases. Gastro-intestinal catarrh, dilatation of the stomach, and hæmatemesis may attend this form of congestion.

The liver sometimes becomes enormous, extending six inches below the costal margin. Pulsation is sometimes felt in it. It is not the communicated throbbing of the heart that is felt, which is very difficult from the heaving, diffuse impulse due to regurgitation into the hepatic veins, in which, when one hand is upon the ensiform cartilage, and the other upon the right side at the margin of the ribs, the whole liver can be felt to dilate with each impulse.

In these severe cases, it has been observed that hæmatemesis, hemorrhage from the bowels, or from piles, promptly relieves the congestion and lessens the size of the liver. This has led to the Anglo-Indian practice of aspirating the liver, "drawing off eighteen to twenty ounces." This operation has been frequently performed

by the surgeons of our Southern States. In our Northern States such severe congestion rarely occurs. In two cases under my observation, in men who had lived several years in Louisiana, I relieved them by the use of agaricus and aurum muriaticum. They had previously been drugged with calomel.

Agaricus and aurum have been found of great value in hepatic enlargements from engorgement.

In Dr. Burnett's very interesting little volume on "The Greater Diseases of the Liver," he gives many illustrative cases where enlargements with probable organic changes recovered under the use of the hepatic remedies I have mentioned. Nearly all medicines which increase the functional activity of the liver do so by increasing the circulation in the liver. In toxic doses, this increase reaches pathological congestion, primarily acute, secondarily passive.

But when the passive hyperæmia is due to cardiac changes our remedies should not be wholly directed to the liver, but to the heart. These cardio-hepatic congestions require digitalis, strophanthus, convallaria, cactus, strychnine and other cardiac restoratives. The great value of euonymin in such cases is due to its influence on the heart and liver; podophyllin has some such action.

One of the most enormous livers I ever saw, attended with ascites, jaundice, feeble heart, intermitting pulse, and bile intoxication, was relieved in a few days by mercurius dulcis, two grains every four hours, alternated with tablets of digitalis and strychnine 2x.

Dujardin Beaumetz ("Diseases of the Liver"), in summing up the treatment of chronic hyperæmia, says: "But of all the curative means employed, the most effective is the thermal treatment. Here we witness the triumph of Vichy and Carlsbad." Our school in this country have reprehensibly neglected the great aid we can gain from the methodical use of similar waters which are found here. Nothing can be accomplished in these passive hyperæmias, unless we reduce the diet of the patient to rational limits. All alcohol, sugar, new bread, high-seasoned soups and meats, except fish and lamb, must be given up. If this does not suffice, and the patient has not a dilated stomach, put him on a diet of Vichy and milk with zwiebach; a glass of half milk and half Vichy, with a slice or two of zwiebach, every three hours. This will soon reduce the size of the liver, and lessen the engorgement. This diet will not distress the

patient as much as he thinks, but he cannot engage in hard physical labor; he should, however, exercise in the open air. Euonymin 2x and nux 2x are admirable remedies in such conditions.

Dr. Burnett, in his little treatise, shows such an intuitive appreciation and knowledge of the curative powers of our indigenous remedies that I cannot forbear quoting some of his cures of the condition he terms enlargement of the liver. This condition was probably intense engorgement, for we cannot believe any remedy will remove interstitial growth of that organ. Burnett quotes Rademacher's theory of the action of chelidonium,— that it affects the inner liver. As he gives the symptoms of this derangement of the inner liver, we know that the hepatic cells were in a condition of functional derangement. Chelidonium has no rival in this respect. It also deranges the venous circulation in the liver, causing hyperæmia with enlargement.

Burnett reports a case of enlarged liver with jaundice in a woman of seventy, presenting all the typical symptoms of hyperæmia, which he cured in ten days with "small material doses" of chelidonium. Another case, a young officer from India, with enlarged and engorged liver and right lung, was cured with chelidonium. Burnett states that a differential diagnosis between chelidonium and carduus can be found in the fact that the former is indicated where the enlargement is "in the perpendicular line," while the latter cures enlargements "in the transverse measurement." This might be considered conjectural did he not give illustrative cases. He does give several wherein he uses material doses of each drug, five to ten drops several times a day. He gives a curious indication for carduus, namely: the sternal brownish patch of skin, the same that the laity call a "liver spot." Burnett thinks that this spot indicates disease of the left lobe of the liver. He reports four cases of hyperæmia with jaundice and dyspepsia, and presenting the sternal patch, cured promptly by carduus.

The late Dr. William Morgan, of England, who wrote a small treatise on Diseases of the Liver, and their homeopathic treatment, recommends ammonium muriaticum, and quotes Dr. Budd, who records in his great work, now out of print, cures of enlargement of the liver and spleen from the use of this medicine in five to ten grain doses three times a day. The enlargements had lasted nine

months, and were attended by emaciation, pallor, and irritative fever.

Surgeon-General W. Stewart, in a communication on this subject to the "Lancet," refers to a former communication of his in which he showed that in hepatic congestion, a local depletion of the portal capillaries is effected by each succeeding dose of chloride of ammonium, and that this depletion, unlike that obtained by other measures, was not attended by depression. After stating that, with the exception of Professor Aitken, the other men in England who had used the treatment had not given the necessary attention to diet and management, without which successful results could not be attained, he proceeds to detail the characteristic symptoms produced by the drug in hyperæmia of the liver. "These symptoms occur shortly after the medicine is taken, in from five minutes to half an hour. Sometimes a shock is felt, as if 'something gave way' in the side; at other times a succession of shocks is experienced in the hepatic region, accompanied or not by a prickling sensation, ('pins and needles'), or as if cold water were trickling down the side; or, the action is described as that of 'pulling' one hypochondrium to the other, or from the margin of the right costal arch upwards, and backwards, as if through the liver; or a 'clawing,' 'working,' or 'gnawing' sensation is spoken of as felt by the patient. With the local actions excited in the liver and related parts, motor impulses are similarly communicated to the muscles of the intestinal canal, increasing peristalsis.

"Looseness of the bowels does not, however, contra-indicate the chloride of ammonium. The only thing which contra-indicates the immediate use of the drug in acute cases is the existence of combined hot and dry states of the skin, with pyrexia. Under such circumstances, its use should be preceded by a few small and frequently repeated doses of solution of acetate of ammonium, till the skin is rendered moist. Fomentations or hot bran-bags applied to the seat of the pain in the side will be of use in aiding determination to the skin generally." The author gives the drug in doses of twenty grains three times daily. (Our 1x trituration of ammonium muriaticum will act as well — even in cases where Dr. Stewart says it is contra-indicated.)

HEPATIC CONGESTION IN CHILDREN.

This article would be imperfect did it not include congestion of the liver in children. It is quite common in children who are brought up artificially and are allowed to eat all kinds of sweet and highly seasoned foods. It is frequent in malarial regions, and then is coincident with enlargement of the spleen.

There is no mistaking the symptoms unless the case is quite recent, and there is yet no enlargement of the liver. As an illustration—a child of three to five years is brought to us. He is pale, a sallowy paleness with a lemon tint to the skin. The face seems bloated—especially the lips, sometimes only the upper. The tongue is flabby, broad, with indentations of the teeth on the edges. The eyes are dull, the conjunctivæ muddy. An examination shows the abdomen enlarged, sometimes greatly so, and on percussion the lower border of the liver reaches to the level of the umbilicus. It is hard and somewhat sensitive. The urine is yellow and scanty. The stools may be thin or hard, but are always gray, chalky, or like mortar. The stools of enlarged liver must be distinguished from those of indigestion in children fed exclusively on milk or farinaceous food. The stools in such cases are light-colored, offensive, putty-like, or thin, but they consist of undigested food and the liver is not enlarged. The general appearance of the child is similar to one with hepatic disorders. The urine, however, is red rather than yellow, or more often white or milky, consisting largely of phosphates. In such cases the children need a change of food, from milk and starch to mutton broth, albumen of eggs, with as little farinaceous matter as possible, and that had better be in the form of baked flour, zwiebach, etc., with such remedies as pulsatilla, calcarea, euonymin, podophyllin, together with pepsin and pancreatin, or papoid.

But if the liver is hyperæmic and enlarged, the hepatic remedies alone are sufficient to relieve all the symptoms. It should be remembered that the liver of a child is proportionally larger than that of an adult and that it requires relatively more medicine to act upon it. A non-recognition of this fact brought me some of the bitterest experiences in my early practice. I recall two children, who came under my care with the typical symptoms mentioned above. Following the

recommendation of Hartman and Laurie I prescribed mercurius solubilis 6x, cinchona 6x, calcarea 6x, and several other medicines from the 3d to 6th. The children did not improve during the week or two they were under my care, notwithstanding the careful diet I ordered. The parents naturally became dissatisfied and consulted an old physician of the regular school. In four or five days the little patient had changed wonderfully for the better, and I lost much prestige. I ascertained that they were given mercurius dulcis (calomel), one grain every three hours, until the stools became colored with bile. After that they needed no medicine for the liver decreased in size, the appetite returned, and a rapid recovery followed. I was not above learning from my colleague, and since that time I have never been caught in a similar blunder. Mercurius dulcis or vivus 1x is the chief remedy, but I have cured several cases with euonymin 1x when there was diarrhœa ; podophyllin 2x when there was also distension of the colon; chelidonium when there was a cough and pain under the right scapula and other remedies failed. The conditions above described are often mistaken for worms, and nearly all the cases brought me had been dosed with vermifuges. Worms may be found in the stools, but they are not the cause — rather a consequence of the state of the intestinal secretions. I believe, however, there have been a few cases recorded where jaundice and enlarged liver in children has been caused by the presence of lumbrici in the gall-duct.

JAUNDICE WITHOUT OBSTRUCTION.

This condition will occur when the bile is poured out into the bowels, even when it is secreted too abundantly. According to Murchison this is due:

(1) To the presence in the blood of poisons that oppose the normal metamorphoses of bile.

(2) To enfeeblement, or disorders of the innervation controlling these metamorphoses.

(3) To insufficient oxygenation of the blood, which has the same result.

(4) To hypersecretion of bile, more being absorbed than can be transformed in the normal state.

(5) To abnormal retention of bile in the bile-ducts and intestines by reason of habitual or prolonged constipation.

There are several theories as to the manner in which icterus without obstruction is brought about. Those who have ascribed icterus without obstruction to alterations in the blood, support one of two theories: the one advocated by Frerichs, the other by Kuhne. According to the teachings of Frerichs, the bile which flows into the intestines passes in the normal state back into the blood, where the biliary acids are transformed into the coloring matter of the bile; then this coloring matter is burned and destroyed as fast as produced. But let any circumstances oppose this oxidation, and the bilirubin, being no longer burned, passes into the blood and the different humors of the economy. According to this theory, the failure of oxidation is the cause of this hæmatogenous icterus, which it will not do to confound with hæmaphæic icterus. Murchison has made of this a special group under the name of icterus by insufficient oxygenation of the blood. According to Kuhne, whose explanation starts from similar data, the bile which passes into the intestines under normal conditions is reabsorbed into the blood, where the biliary acids (as seems demonstrated by experimentation) destroy the globules and set at liberty the hæmoglobin which is transformed into bilirubin. When the transformation is too active, naturally the bilirubin would accumulate in the blood and produce jaundice. Other physiologists regard this jaundice as simply and solely due to reabsorption of bile from the surface of the intestine. Lussana and Schiff ascribe a great importance to this "entero-hepatic circulation," which they say goes on between the intestine and the liver. The bile poured into the intestine is reabsorbed by the portal circulation, and returns to the liver, to be anew excreted into the intestine. It is easy to understand that when the biliary secretion is too abundant, a certain quantity of bile and coloring matter may pass into the blood and produce jaundice. Vulpian has, in fact, shown, in contradiction to the experiments of Feltz and Ritter, that when bile is injected into the veins of animals, jaundice is produced. Lastly, other physiologists have maintained that it is in the liver itself that we are to look for the cause of jaundice without obstruction, and in certain pathological circumstances the bile which is secreted in the hepatic cells may pass, not into the radicles of the bile-ducts which surround them, but

directly into the network of blood-vessels with which the liver is so richly endowed.

Dujardin-Beaumetz, in commenting on these theories, says: "All these theories may find their application in individual cases belonging to the large group of icterus without obstruction. Which of these theories shall we adopt? Is there any one which responds better than the others to the different facts which clinical experience furnishes? No, all the theories which I have enumerated may find their application in individual cases belonging to the large group of icterus without obstruction. Jaundice with polycholia, in which congestion of the liver entails a more abundant secretion of bile and the production of icterus, we would explain by the resorption of bile from the surface of the intestine. In other circumstances, the icterus results manifestly from an alteration of the blood. Thus it is that certain animal poisons and certain miasms may be the cause of this affection. In such cases we get most light from the theories of Frerichs and of Kuhne, which find the cause of the jaundice in primary alterations of the blood. As for the cases of icterus called 'nervous icterus,' which are occasioned by strong emotions, anger, fright, etc., and which we cannot explain either by spasm or paralysis of the bile-ducts, we are obliged to hypothecate disturbances of the cerebro-spinal axis and particularly of the bulbus, which determine direct modifications in the circulation of the bile in the hepatic cells; it would seem that the bile, instead of passing from the hepatic cell into the bile-ducts, finds its way into the capillary network. According to Frerichs, in icterus from mental emotions the troubles of innervation may conduce in two ways to the accumulation of bile in the blood:

(1) By modifications in the hepatic circulation, due to the influence which the nerves exercise on the calibre of the branches of the venæ portæ.

(2) By perturbations in the action of the heart or in the respiratory movements, as well as in the renal secretion.

What are the therapeutic indications for the treatment of jaundice without obstruction, based on the data which I have just given? In combating these kinds of jaundice, we should attack the primary cause which has occasioned the jaundice: oppose the alteration of the blood in cases of hematogenous icterus; re-establish the functions

of the liver in those which are due to excess of the biliary secretion; and calm nervous perturbations in jaundice resulting from strong emotion; such are the principal indications to fulfil in the treatment of jaundice without obstruction."

There is still another variety of jaundice called "grave or pernicious icterus." It might properly be called "cholæmia," corresponding to "uræmia." It is thus described by various writers:

Grave icterus (acute, pernicious, typhoid, hemorrhagic, essential, fatal icterus), which Monneret defines: "A bilious, icteric, remittent, hemorrhagic, and adynamic fever, whose almost constant termination is death," may be observed at all ages, but it presents its maximum of frequency between the ages of eighteen and thirty years. Pregnancy seems to be a predisposing cause (Charcot, Frerichs, Laborde, and others). Out of thirty-one cases, Frerichs found nine in the male and twenty-two in the female; one-half of the latter were connected with pregnancy. Lebert's statistics give forty men and only twenty women. Syphilis is said to be a predisposing cause, also excessive labor, malaria, drunkenness, etc. The disease has prevailed epidemically within narrow areas (barracks, prisons, ships). Grave icterus may be grave from the onset; oftener pernicious symptoms set in during the course of an attack of jaundice. In the great majority of cases softening or destruction of the liver has been found in connection with it (acute yellow atrophy). The onset is often insidious. If sometimes the disease begins suddenly by a chill, headache, vomiting, generally the first symptom is a simple digestive disorder. The patient complains of fatigue, is in bad trim, without appetite, with a little headache, fulness at the epigastrium or over the liver. These symptoms go on increasing, the patient gets weaker and weaker. The jaundice first appears limited to the conjunctivæ, and extends to the rest of the body. Coincidently there are often hemorrhages of variable magnitude, from the bloody oozing of the gums, sanguinolent expectoration, cutaneous extravasations, to copious bleeding from the stomach, nose and intestines. The fever, which was nil or intermittent at first, becomes ordinarily remittent about the eighth day, with nocturnal exacerbation and agitation. The debility augments, and yet there is sometimes on the part of the patient a gaiety and an indifference which contrasts singularly with the gravity of the general condition. The intelligence

remains intact; it is not till the last stages of the disease that the patient is delirious or convulsed in the trunk and limbs; a persistent hiccough sometimes complicates the suffering of the patient. The heart sometimes presents a murmur, due, according to Potain, to a temporary tricuspid insufficiency. The urine shows nothing characteristic at the onset, but soon becomes of high color and may be bloody, either from passage of the coloring matter of the blood or blood itself into the renal secretion. The urea seems to augment at first, then diminishes, and may fall as low as 50 c. c. in the twenty-four hours. Leucin, tyrosin, xanthin, and hypoxanthin, sometimes albumin, are found in the urine. The microscope reveals casts and bloody globules. In cases that terminate favorably, amelioration is ushered in by a copious diuresis. The progress of grave icterus is rapid; death sometimes supervenes the fifth or sixth day, generally from the seventh to the twelfth day. The patient succumbs in a state of somnolence, coma, algidity, or in convulsions. Although the termination is generally fatal, yet quite a number of cases of recovery have been reported."

From the above description you see that occasionally in jaundice symptoms of the greatest gravity appear. Hemorrhages from the mucous membranes supervene; cerebral disorders manifest themselves; the patient falls into profound adynamia and succumbs more or less rapidly.

The uncertainty as to the cause of this pernicious form makes the treatment very uncertain. Old-school authorities fall back on the use of cinchona and quinine, simply as tonics against the adynamic condition. In our school, we are obliged to treat the patient according to the totality of his symptoms.

Picric acid corresponds to all the symptoms, but unfortunately the jaundiced color of the skin caused by that drug has not yet been proved to be due to the presence of bile or any of its elements in the blood. But after all, picric acid may be a good remedy for it. The serpent-poisons may prove curative, for their general effects are quite similar. Grave cases of jaundice have been cured by lachesis and crotal; plumbum, copper, and phosphorus may be found to be of value.

The treatment of icterus from emotions or other neurotic influences will have to be treated according to the law of similia. Col-

ocynth and chamomilla have cured such cases, and it is said that nux vomica and ignatia have been useful. The jaundice occurring in the infectious and contagious fevers is a part of the general condition and must be taken into consideration when selecting the remedy.

Another cause of jaundice without obstruction, mentioned by Legg, is one I have several times alluded to in my "Lectures on Diseases of the Heart," viz: decreased pressure of blood in the blood-vessels of the liver. If the pressure of the blood upon the sides of the vessels in the liver be decreased, the bile will pass in the direction of least resistance, that is, into the circulation. Heidenhain has given experimental evidence of the truth of this hypothesis. He found that on decreasing the pressure of the blood in the vessels of the liver, the bile already formed began to pass into the circulation.

This lowering of the blood-pressure in the liver may be caused: by (a) plugging of the portal vein in cases of pigment liver, bleeding from the roots of that vein, yellow fever; by (b) too high arterial tension from arterial sclerosis; and by (c) a weak heart, with or without stenosis or regurgitation.

I have already mentioned how the absorption of bile into the blood causes a slow pulse and weak heart, and even structural changes. Now suppose we have a patient with weak heart from any cause; the blood-pressure in the liver is less than normal. Those who have treated many cases of heart disease are aware that attacks of jaundice are very frequent, when the heart's action is quite low; and they must have observed, as I often have, how quickly the jaundice will disappear under the influence of medicines that impart strength to the heart. Digitalis, sanguinaria, strophanthus, cactus, strychnine, and muriate of hydrastin (the white alkaloid) are the most potent remedies for this state. In the country, in domestic practice, the people have great confidence in wild cherry bark (prunus vir.) in jaundice. I have observed cures from its use, but the patients were delicate persons with poor circulation, or suffering from pulmonary or cardiac diseases. It was usually taken in decoction, or a saturated tincture made with whisky. Prunus vir. is a cardiac tonic of no mean power. The fact that the slow or intermittent pulse of jaundice is worse when sitting or lying, and becomes more regular and stronger when walking, suggests that, if there is no structural weakness or obstruction in the heart, we should advise exercise,

fresh exhilarating air, and a little alcoholic stimulant. If arterial tension is the cause of the deficiency of blood-pressure in the vessels of the liver, it may be due to vaso-motor contraction, or sclerosis. If the former, the remedies are glonoine, veratrum viride, nitrite of sodium, and aconite. If the latter, iodide of sodium or iodide of barium should be alternated with glonoine or one of its analogues.

If there is anæmia some preparation of iron may be given — the 1x of iron by hydrogen; the syrup of succinate of iron, which is believed to be the best in all cases of diseases of the liver; or some mineral water containing iron combined with alkalies.

The hemorrhages occuring in jaundice are often profuse and prostrating. The best remedy I ever used in such cases is hamamelis; not the dilution but twenty to thirty drops of the tincture every two or four hours. Next in value is dilute sulphuric acid, ten drops in a little water every hour. Carduus is often equal to either of the above, in doses of ten to fifteen drops every hour. It matters not where the bleeding may be — in nose, lungs, or bowels — these remedies are fully indicated.

ICTERUS (JAUNDICE).

All cases of jaundice may be referred to one of two classes:

(1) Cases in which there is a mechanical impediment to the flow of bile into the duodenum, the bile in consequence being retained in the biliary passages, and absorbed thence into the blood.

(2) Cases in which there is no impediment to the escape of bile from the liver into the bowel.

Mechanical obstruction may be subdivided as follows:

(a) *Obstruction by foreign bodies within the bile-duct.*

(1) Gall-stones, and inspissated bile.

(2) Hydatis, distoma.

(3) Foreign bodies from the intestine.

(b) *Obstruction by inflammatory tumefaction of the duodenum, and lining membrane of the duct.*

(c) Obstruction from congenital deficiency of the duct; stricture from peri-hepatitis; ulcers in the duodenum and bile-ducts, and spasmodic stricture — if such a condition can exist.

Murchison mentions many more causes, but they are so very rare

that we need not consider them at all. Jaundice in pregnant women from pressure of the uterus; and jaundice from enormous accumulation of fæces in the colon, and from large tumors of all the abdominal organs, are of more frequent occurrence.

Cases of jaundice under class 2, in which there is no impediment in the bile-duct are due to —

(a) Poisons of the specific fevers: yellow fever, remittent and intermittent fevers, relapsing fevers, typhus, scarlatina, and "infectious jaundice."

(b) Pyæmia, snake poisons, phosphorus, mercury, copper, antimony, chloroform, ether, and all drugs which act as powerful hepatic stimulants, may cause jaundice as a secondary effect. Severe mental emotions, fright, anxiety, anger, constipation, congestions of the liver, etc.

"When any obstruction exists to the flow of bile through the hepatic or common bile-duct, the way in which jaundice arises is sufficiently clear. The bile-ducts and the gall-bladder become distended with bile, which is absorbed into the blood by the lymphatics and the veins. This was satisfactorily proved at the end of the last century by the experiments of Dr. Saunders, which have been confirmed by many subsequent observers. If a ligature be applied to the hepatic duct of a dog, and the animal be killed after two hours, the lymphatics in the walls of the bile-ducts, which are very numerous, are seen to be distended with a yellow fluid; the fluid in the thoracic duct is also yellow, and so likewise are the intervening lymphatic glands. In patients, also, who die of obstruction of the bile-duct the lymphatics of the liver are often found to contain bile. On the other hand, the serum of blood taken from the hepatic vein two hours after ligature of the common bile-duct is found to contain much more bile-pigment than that of blood taken from the jugular vein, which shows that, in obstruction of the gall-duct, bile is also directly absorbed by the veins. (Murchison.)

The diagnosis of jaundice from obstruction of the bile-duct is simple: Examine the fæcal discharge and the urine. If both contain bile, the case is one of obstruction. The examination with the naked eye by an experienced physician is generally sufficient. If there is any doubt, use the iodine test, which causes an emerald green tint when a few drops are added to a thin film of urine on a plate;

or you can filter a little of the urine, and from a pipette let fall a few drops of nitric acid on a small quantity in a test-tube; you will observe a beautiful play of colors, yellow, green, blue, violet, and red.

The two most common causes of jaundice you will have to deal with are *gall-stones*, and *catarrhal inflammation of the duodenum and gall-duct.*

The treatment of gall-stones will be found in another chapter. Catarrh of the gall-duct is generally an extension of catarrhal gastritis. The duct swells inside, the membrane exudes a tenacious mucus which plugs up the already narrowed calibre of the canal. Unlike jaundice from gall-stones, which comes on suddenly after an attack of bilious colic, catarrhal jaundice is gradual, and preceded by catarrh of the stomach, which may extend throughout the whole digestive tract.

The chief remedies are gelsemium, hydrastis, myrica, podophyllin, nux vomica, salicylate of sodium, iodide of arsenic, or any drug causing gastric catarrh. Gelsemium seems to be capable of arresting the catarrhal inflammation at its onset. It is not of much value when the catarrh has become fixed. Hydrastis is invaluable when the gastric and duodenal mucous membrane exudes large quantities of whitish-yellow mucus, with much vomiting. Our provings do not show any jaundice from hydrastis because they were not carried far enough. Myrica, which was proved under my supervision, caused a typical catarrhal gastritis with vomiting of thick, tenacious mucus, jaundice from obstruction, etc. Dr. Burnett reports several cases of extreme jaundice cured by both. Podophyllin causes a true catarrhal duodenitis followed by jaundice, and the cases reported from its use are innumerable. Nux vomica is the specific for the gastritis of gluttons and spirit-drinkers. The 1x of the tincture, and 3x of the myrica, podophyllin, or hydrastin, should be used. Nux 1x to 3x, salicylate of sodium 1x, is an excellent adjuvant — ten grains in a glass of Vichy or Carlsbad water. They thin the bile, and increase the quantity, and thus aid in expelling the plug in the duct. If accumulation of fæces is found, distending the colon until it pushes up the gall-bladder, give castor oil and olive oil, equal parts, a tablespoonful every hour or so until the colon is empty. This may have to be aided by massage of the colon, and glycerine enemata.

I have seen many cases of jaundice in the last month of preg-

nancy, but never found any medicine to remove it. We must wait for the uterus to be emptied by labor. Spasm of the duct is denied by many, but I believe it may exist. It can be caused by fright, anger, or other neurotic irritation, and we know it exists during the passage of gall-stones. It is in such cases that belladonna, chloroform, and nitrite of amyl have given relief.

When inspissated bile causes obstruction it must be preceded and attended by an abnormal secretion of bile, thicker in consistence than the normal fluid. Such bile is dark in color and contains more solid matters. The treatment of this obstruction is by giving those drugs which thin the bile and lessen its solids. The waters of Vichy, Carlsbad, Congress, and French Lick do this. So do the acid fruits (without sugar), for in the stomach they form alkaline salts. The medicines indicated are iridin, chelidonium, chionanthus, carduus, euonymin, nitro-muriatic acid, and salicylate of sodium. Flushing the colon with cool alkaline water is useful, as it excites reflexly the bile-ducts to expulsive action.

Diet.— Contrary to popular prejudice the best diet in obstructive jaundice is milk in some form. I prefer skimmed milk or buttermilk, taken with Vichy, Seltzer, or Apollinaris water, equal parts. Allow no farinaceous or nitrogenous foods, rather fresh vegetables and sour fruits if they do not disagree with the stomach. The milk should be given regularly, a glass every two hours during the day until the patient falls asleep, at night. Do not allow constipation to exist. If fruits and enemata do not clear the colon, give olive oil, which is a cholagogue, a tablespoonful every four hours; and failing with that a pill of "aloin, belladonna, strychnine, and ipecac," or one-fifth of a grain of pure aloin — at night.

Dr. Jean de Wee, of Brussels, in the "Révue Homœopathic Belge," refers to the properties of dolichos pruiens in controlling the pruritus which accompanies many forms of jaundice. In two of his cases, one a case of tumor of the liver, and one of recurrent jaundice from congestion, due to lithiasis, it did signal service. In the former he gave the mother tincture, in the latter the 8x dilution. In a case of catarrhal jaundice *without* pruritus it completely failed to do any good, carduus marianus proving very effective after its failure.

Such are the most common and useful therapeutic measures in

this affection; by their use the catarrhal jaundice may disappear quite promptly, but in other cases it is more persistent and may last for months. It will be necessary then to have recourse to other means which fulfil the second indication mentioned, viz.: to combat the symptoms caused by the passage of bilirubin into the blood. This therapeutic indication is especially applicable to persistent and chronic icterus, which manifests itself constantly by such symptoms as these:—there is obstinate constipation, but this is not all, the intestinal acholia also prevents regular absorption from the surface of the intestine. Hence the phenomena which have been noticed in jaundice by obstruction; retardation in the functions of nutrition, bleaching of the fæcal matters, which often have a horribly fœtid odor. Such are the symptoms produced by acholia.

In treating jaundice I always give one or two grains of ox-gall with each meal. Bile excites the peristaltic movements and clears the bowel, neutralizes the acidity of substances peptonized by the stomach, and, to a certain extent, opposes the fermentation of matters contained in the intestines, and perhaps favors the digestion of fatty substances. We must administer food in little quantity and such as demands but little work on the part of the intestine; we must also take care that what the patient eats shall not give rise to too active a fermentation in the intestine; and the most of these indications, it must be admitted, are met by an aliment whose utility Dujardin so highly extols, viz.: *milk*.

You want especially to combat here the symptoms arising from intestinal putridity, which result from absence of bile in the intestine; bile being, as I have said, an antiseptic agent of the first order. For my part, I am persuaded that in explaining the nervous symptoms which ensue in prolonged cases of jaundice, we should make much account of the penetration into the economy of putrid substances and of ptomaines absorbed from the surface of the intestine. For this purpose I know of no agent superior to salol, in doses of three grains every six hours. It has some cholagogue action on the liver, also.

Many other means have been advised. Some have proposed wood charcoal, others iodoform, others, as Bouchard, naphthalin or naphthol; Dujardin-Beaumetz recommends to employ sulphide of carbon water; his formula is as follows:

℞ Pure sulphide of carbon	25	grams.
Water	500	grams.
Essence of peppermint	30	drops.

M.— Place in a flask capable of holding 700 cubic centimetres. Shake the mixture and allow it to settle. Decant off the clear solution when needed. Renew the water as fast as it is poured off from the flask. You may give every day five or six teaspoonfuls of this bisulphide of carbon water, taking care to dilute each dose in half a tumbler of milk. In employing this simple remedy, he says you will see the fœtidity of the stools rapidly disappear in the most intense cases of jaundice by retention.

Bilirubin produces very painful cutaneous itching. I have known patients in whom this symptom became a veritable torture, and you must expect to witness this pruritus at advanced periods of icterus. What succeeds best in these cases is massage and vapor baths, and salicylate of sodium, which temporarily allay this annoying pruritus. Lastly, bilirubin, in being absorbed into the blood, determines phenomena very similar to those caused by digitalis, *i. e.*, it slows the pulse and circulation. Icterus even modifies the state of the heart muscle, and gives rise to a cardiac murmur. The study of the alterations of the heart produced under the influence of icterus is of quite recent date. These alterations manifest themselves by a *bruit de souffle*, the origin of which is not yet well known. This peculiar mitral murmur is accompanied by a presystolic *bruit de galop*. According to Fabre, there are three kinds of cardiac troubles in icterus ; troubles in the innervation of the heart, troubles in the nutrition of the left ventricle, and dilatation of the right ventricle. Moreover, it alters the blood crasis and gives rise to hemorrhages, of which Monneret has treated at length. It produces also in the mental functions a very peculiar modification to which alienists have called attention, which manifests itself principally by hypochondriasis and profound gloom.

I recall an obstinate case of catarrhal jaundice which gave me abundant proof that the heart may be poisoned by bile until structural changes occur. The patient, a stout man of fifty, had never had any heart trouble. I had examined him a short time before his jaundice and found the heart normal. An ordinary attack of influenza extending to the stomach resulted in duodenitis, with result-

ing jaundice. There was no appearance of bilious colic, the icteric hue of the skin coming on gradually, the skin assuming the hue of greenish-bronze at the end of three weeks. His mind was clouded and he was morose and gloomy. He took nux, cinchona, podophyllin, and several other medicines, but without benefit. I observed that his pulse became slower and weaker day after day, and finally intermittent and irregular. On examination I found the abnormal sounds mentioned by Fabre. Leaving off all other medicines, I prescribed five drops of tincture digitalis every four hours. Improvement in the condition of the heart commenced at once; the bile appeared in the stools, and disappeared from the urine. The digitalis, with nux vomica one-hundredth, five drops, was continued for several weeks, giving them only every other day, when I found the heart sound and rythm of the pulse normal.

Respiration has an important office in the combustion of the coloring matter of the bile, which belongs to the group of carbon compounds, and Frerichs has rightly insisted on the utility of compelling the patient to live out-of-doors, take long walks, horseback rides, and indulge in gymnastic exercises. The kidneys play an important part in the elimination of bilirubin, and we find constantly in the urine of jaundiced patients a considerable quantity of this coloring principle. You must, then, promote the elimination of this substance. In grave icterus, if, for any reason, this emunctory becomes obstructed, accidents of high gravity supervene. Therefore I am fully of the opinion of Dujardin respecting the functions of the kidneys in jaundice, and ascribe to that organ an important role in the production of malign icterus. You ought, then, in chronic icterus, to administer the benzoates, benzoic acid, and especially milk, that admirable medicament, which, fulfilling special indications pertaining to digestion, also assists the elimination of bilirubin by the urine. Support also the forces of the patient; do what you can to prevent hemorrhages; oppose the evils resulting from retardation of the circulation, by subjecting your patient to a tonic treatment; prescribe journeying and change of scene—you will thus divert your patient's mind from constant brooding over his disease, and antagonize the gloom and depression of spirits so common to icteric patients. Where the obstruction of the duct cannot be removed by medicine, two therapeutic means have been proposed: dilatation of the biliary pas-

sages and gall-bladder; aspiration or paracentesis of the gall-bladder and electrization according to the method of Gerhardt of Wurzburg. As for the electrization of the gall-bladder in catarrhal jaundice, Gerhardt's method is of the simplest kind. He employs a strong faradic current. One pole is applied as accurately as possible with some pressure (the place being determined by palpitation and percussion) over the region of the gall-bladder. The other pole is placed on the region of the back opposite, and now and then both poles are moved to and fro. Gerhardt claims remarkable results (even the overcoming of mucus obstruction and reduction of the gall-bladder) from this faradic treatment. (Gerhardt, in Berlin "Klin. Woch.," 1873, No. 47.)

Dr. Legg, whose immense work on "The Bile, Jaundice, and Bilious Diseases" is a monument of erudition, mentions one cause of jaundice which should not be overlooked, namely, partial obstruction of the ducts.

The experiments of Heidenhain show that the pressure under which bile is secreted is extremely small. A very little obstruction to the passage of bile into the duodenum is needed to cause the bile to flow back into the blood. Nor is it necessary that the obstruction should be complete, but merely that the bore of the duct should be narrowed enough to cause the bile to pass with some trouble into the bowel. It would almost seem that the bile passes as readily into the circulation as into the duodenum; thus jaundice may easily be caused by a hyperæmic or catarrhal swelling of the parts of the common duct which passes through the walls of the duodenum, and yet after death all trace of swelling will have disappeared, and the duct will be fully patent. The only proof of the existence of an obstruction is the finding of the part of the duct below the obstruction uncolored with bile. We are sometimes surprised to find some bile in the stools, while the urine and skin shows its presence. The above explains the matter. A small stone may partially obstruct the duct, leaving just space enough for a little bile to escape. Straw-colored or lemon-hued stools would indicate that the obstruction is partial. It is probable that phosphorus may prove a remedy for catarrhal jaundice, for Wyss and Ebstein found in the livers of dogs and men poisoned by phosphorus that the finer ducts within the liver were plugged with a colorless mucus, a plain cause of the

jaundice. It may be that the suppression of the flow of bile caused by iodide of potassium, as observed by Rutherford, may have been due to the same cause. Both drugs may therefore be indicated in minute doses in catarrhal jaundice.

GALL-STONES.

Biliary calculus, says Dujardin, is a frequent affection, giving rise to symptoms known under the name of hepatic colic. Before we enter upon the symptoms and treatment, let me refresh your minds concerning the anatomy of the gall-ducts.

The hepatic duct takes its origin in the liver by that net-work of biliary canaliculi which surrounds the hepatic cells. After a short transit this duct meets the cystic duct from the gall-bladder, and both unite into one duct, the ductus choledochus, and empty into the duodenum by the ampulla of Vater. The mucous membrane of these ducts presents little valves or folds especially in the neighborhood of the cystic duct. The question whether these ducts possessed muscular coats, although denied by Kœlliker, Virchow, and others, has been decided in the affirmative by the experiments of Renant and Grancher working under Dujardin-Beaumetz. The results of their labor were decisive; both show that there undoubtedly exist smooth muscular fibres in the bile-ducts, and that these muscular fibres are disseminated throughout the fasiculi of connection and elastic tissue, constituting the fibrous coat of these ducts, and that inflammation taking place in the duct thickens this muscular layer. So that it is now well settled that the excreting bile-ducts are fibre muscular tubes which are the seat of more or less energetic contractions. It has also been shown that under the influence of induction-currents the gall-bladder and bile-ducts all undergo manifest contractions. The calculi which pass through these ducts, causing bilious colic, are variable in number and volume. In the vast majority of cases they are constituted of cholesterine, or bile pigment, forming stratified layers of different colors according as they are more or less colored by bilirubin.

The number of calculi is very variable. Ordinarily from five to twenty are found in the gall-bladder. In some cases they are single; in other cases considerable numbers are met with. In a

woman, sixty-one years of age, Frerichs counted 1950. Morgagni has counted 3000, Hoffman 3606, and in the collection of Osto there is a gall-bladder containing 7802 calculi. All the calculi contained in the gall-bladder, whatever the number, are of the same chemical composition, color, and structure. Their size is variable, from a grain of millet seed to a hen's egg. Fanconneau-Dufresne has divided gall-stones into three classes:

(1) Those of small size, from a grain of sand to a small pea.

(2) Middle size, from a small pea up to a filbert.

(3) Large size, from a filbert up to a hen's egg.

The calculi may be olivary, pisiform, lenticular, polyhedric, cylindric, cubic, finger-shaped, have the form of dice, of coins, of pyramids, etc. They may be smooth, hollow, and striated, etc. But the ordinary typical form is the olive-shaped. The solitary calculi are roundish or ovoid. Multiple calculi ordinarily present facets, which appear to be due to the massing together of the calculi, and not to the friction of one upon another, for you do not often find, on examining gall-stones, any interruption in the lamellæ constituting them, which would be apt to take place if the facet was the result of friction.

Nevertheless, in 1851, Barth found in the gall-bladder of a woman of sixty-three years a dozen irregular calculi, with rough surfaces; he remarked that certain of these calculi had been broken and a little worn by friction. Other observers have recorded similar facts. Some have found in the gall-bladder, not stones properly so-called, but a thick, pasty, whitish mass composed almost entirely of cholesterine (Besnier), or even a biliary sediment of the consistence of mud (Durand-Fardel).

Ordinarily, however, the biliary concretions are quite consistent, although they are marked easily by the finger-nail; the hardest calculi are those of cholesterine. The structure of the calculi is variable, and has been well studied by numerous authorities, who have differently divided these biliary concretions. Walter's classification is: (1) The striated calculi, transparent or opaque, which may be either smooth or anfractuous; (2) the lamellated calculi, whose substance is disposed in layers around a nucleus; (3) calculi enveloped by a cortex. Hein's classification is: (1) "Simple calculi"; (2) "composite calculi." Frerichs divides calculi into: (1) Simple

homogenous calculi, whose structure is uniform, whose fracture presents an earthy, soapy, or crystalline surface, and which have neither nucleus nor cortex; (2) composite calculi, presenting a central nucleus surrounded by a zone more or less thick, and covered by a cortex. The nucleus, brown or black, is composed of colepyrrhine and lime, cholate of lime, or of cholesterine. The nucleus, ordinarily single and central, is sometimes eccentric. There may even be in a calculus several nuclei. In a dry state these nuclei may undergo a sort of retraction, become split or even fragmented. The smaller the calculus, as a rule, the larger the nucleus. Cases have been mentioned in which the nucleus was constituted by a foreign body, such as a lumbricus or blood-clot. The middle layer, immediately surrounding the nucleus, is generally striated, and constituted by crystals of cholesterine, pure or mingled with pigment. Concentric zones are also generally observed, indicating the growth of the calculus by successive strata. The cortex is generally more or less thick, sometimes smooth and sometimes mammillated, but it is clearly distinguished from the middle layer by its color, its stratified appearance, and its consistence. It is formed either by cholesterine, of bile pigment, or of lime. Biliary calculi are formed at the expense of the elements of the bile; rarely they are composed of a single substance, they are ordinarily mixed. Cholesterine is generally the basis of these stones; next in the order of frequency come bile pigment and lime salts. Charles Robin divides calculi into calculi of cholesterine and calculus of coloring matter. Those of cholesterine pure are colorless or nearly white. Subjected on platinum foil to a lamp flame, they first melt, then burn like a fatty substance, giving off a sooty light. If the calculi is composed of pure cholesterine there remains no residue on the platinum foil. Insoluble in caustic potassium and sodium, they are very soluble in boiling alcohol and in ether. A drop of this ethereal solution under the microscope gives colorless rhomboidal plates by evaporation. Concentrated sulphuric acid colors these calculi yellow, and boiling nitric acid transforms them into cholesteric acid.

The calculi of the coloring matter of the bile (biliverdine and cholepyrrhine) are brown, black or dark, deep green or greenish, according to the quantity of coloring matter. They do not melt when heated, they burn without flame, and leave a sooty residue.

They are insoluble in ether and alkaline liquids. Treated by nitric acid, they pass successively through different shades of colors: green, blue, violet, red, and yellow. To ascertain the composition of the calculi, Luton, of Rheims, has proposed a very simple method of analysis, which consists in subjecting a portion of the calculus to the action of solvents, hot alcohol, for instance, then allowing it to become cold; crystalization takes place and the microscope enables one to recognize the principal constituent elements of the calculus: rhomboidal plates of cholesterine, needles and bacillary crystals of cholate of lime, etc.

Under the name of biliary gravel, Fauconneau-Dufresne classes only such concretions as are under the size of the smallest lentil, and which present no appearance of structure. He gives three varieties: cholesteric gravel, pigmentary gravel, and melanic or carbonaceous gravel.

I have said that the calculi are constituted by deposits of cholesterine; what are the circumstances which lead to the precipitation of cholesterine? We have to study the two following causes: either the cholesterine remains normal, or the other elements of the bile undergo modification and lead to precipitation of the latter. Let us take up the case where cholesterine is in excess, and here you must recall to mind what you know concerning its origin.

Physiologists, as I have told you, are agreed in accepting Flint's conclusions, deduced from his careful experiments, and in considering this substance as a product of disassimilation of the nervous system. This experimental datum seems to be confirmed, in a certain measure, by clinical experience, for it is principally in women with highly developed nervous systems that you observe biliary lithiasis; and for my part, the more my attention has been directed to this explanation, the more firm is my conviction as to its truth. It is chiefly young women, nervous and impressible, who are the subjects of hepatic colic. It is probable that in these cases the too active exercise of the cerebro-spinal axis explains the excessive production of cholesterine and its precipitation in consequence of over-production, and I am convinced that this circumstance has not been sufficiently taken account of by the different authorities who have considered this question. The second cause of the precipitation of cholesterine, *i. e.*, the modification of its vehicle, the quantity of this sub-

stance remaining the same, has been studied by Thenard, who has indicated, as a factor which may bring about this precipitation, the diminution of the salts of sodium. Moreover, Branson has shown that the appearance of lime in the bile may cause the precipitation of the coloring matter. Lastly, the bile, which in the normal state is alkaline, may become acid, and this is especially likely to take place under the influence of animal diet; and acid bile favors the precipitation of cholesterine. Moreover, as we frequently find a nucleus of mucus in these calculi, we must assign an important role to the inflammations of the bile-ducts; these inflammations cause a hypersecretion of mucus which may give rise to a nucleus, around which the cholesterine deposits itself. Such are the physical and chemical causes which favor the production of calculi. It has not, in fact, been proved, either by experimental or chemical observations, that a diet exclusively of fatty food predisposes more than any other to biliary lithiasis. Another feature plays an important part in pathogeny, namely, allowing too long an interval to elapse between meals. Physiology in fact teaches that during digestion the bile flows in great abundance into the duodenum, and that the gall-bladder nearly or quite empties itself at this time. We know also that one of the predominant causes of the precipitation of cholesterine in the bile is the prolonged sojourn of that liquid in the gall-bladder. When the meals are too far apart, or when, as is the practice of some persons, only one meal a day is eaten, the gall-bladder is placed in a favorable condition for the precipitation of cholesterine. There is another factor which also aids the flow of bile, viz., the respiratory movements, which by the pressure which they effect upon the gall-bladder and the intestinal mass through the intermediation of the diaphragm tend to empty the gall-bladder. Hence the influence of want of exercise on the production of these calculi is apparent, and it is, in fact, sedentary persons whom we find to be the most subject to biliary lithiasis. Add that active respiratory movements favor the combustion of fatty matters, and you easily understand why we assign the first place to exercise in the hygiene of lithiasis.

"The diatheses have a notable influence on the production of biliary lithiasis, and despite the opposition of Durand-Fardel to the doctrine of Willemin, who maintains that biliary lithiasis, like urinary lithiasis, depends on the uric acid diathesis, it is none the less true

that we find more cases of biliary calculi among the arthritic than among any other classes of people. Heredity seems also to play a prominent part in biliary lithiasis. Pepit and Willemin cite examples, as also do Budd and Fauconneau-Dufresne. Senac, in studying the family health and constitution of patients who have consulted him, has so often met with different manifestations of the arthritic diathesis, that he believes this diathesis to be an important factor in biliary lithiasis. To the support of this view, he brings forward a certain number of observations which seem to place the matter beyond all doubt. Beneke has also set forth the relation which exists between atheromatous degeneration of the arteries and biliary lithiasis. He has found that in three-fourths of his cases (350 autopsies made by him at Marbourg) there was atheromatous degeneration of the arteries along with biliary lithiasis. To sum up, all the facts go to prove, as Bouchard has well shown, that the cause of biliary calculi resides essentially and primarily in a general disturbance of nutrition.

"We know now the causes which are operative in the formation of calculi, and we have studied the anatomy of the bile-ducts. Let us now consider the mode of passage of gall-stones in the different ducts, and the accidents which may result from their presence. In the immense majority of cases, calculi form in the gall-bladder; this is where the major part of the bile accumulates and sojourns; nevertheless, in certain circumstances, true biliary gravel has been known to be deposited in the hepatic bile-ducts, and to manifest its presence in the radicles of the hepatic duct and in the hepatic duct itself. But such facts are exceptional; ordinarily the calculus, when formed in the gall-bladder, may increase in size and remain there a long time without determining any symptoms, and this is so true that at the autopsies of the aged women at the Salpetriére, it may be said that this is the rule to find in the gall-bladder calculi more or less voluminous, without any disturbance having been noted during life therefrom. But at other times, calculi of little size pass with the bile into the cystic duct and thence into the ductus choledochus, and are voided by the intestine. These calculi may make their journey from the gall-bladder to the intestine without causing any attack of colic, and in my own practice I observed several years ago a very curious instance in one of my patients who had been passing by stool a con-

siderable quantity of biliary gravel without ever feeling any colicky pains. At the same time there generally ensues an aggregate of painful symptoms described under the name of hepatic colic. In 1873, I made, with Dr. Audige, numerous experiments in order to obtain a clearer understanding of the way these gall-stones pass through the biliary passages. We first of all discovered in animals that the bile-ducts when irritated are the seat of a real spasm, which is, moreover, easily explained, if you recall to mind the anatomical structure of these ducts. Then we artificially reproduced the attack of hepatic colic, for after having introduced into the common bile-duct of dogs by the intestinal opening certain foreign bodies, we observed the extreme sensibility of these conduits in these animals and the mode of passage of the calculi, which by reason of the spasmodic movement of which the ducts are the seat, travel either towards the intestine or gall-bladder. This is a fact of capital importance, which even justifies the affirmation that when, in persons affected with biliary colic, you do not find the offending body—the corps du delit—in the stools, you should not at once conclude that the calculus does not exist, and make the diagnosis of hepatalgia. It may happen, in fact, that the calculus, after having traversed the ductus choledochus a part of the way towards its intestinal opening, shall return to its starting point and fall back into the gall-bladder. These experimental researches, which have since been confirmed by Laborde, demonstrate that in hepatic colic there is a veritable painful spasm of the bile-ducts. Trouseau's penetrating mind understood this spasmodic action of the bile-ducts. In the very faithful description which he has given in his "Clinical Medicine" of hepatic colic, he speaks of the ejaculation of bile into the intestine, and assigns a considerable role to the muscular layer of these ducts. Senac, however, the author of a remarkable study on the treatment of hepatic colic published in 1870, has most clearly shown the importance of these spasms. Hence, from the point of view of general pathology, there is good warrant for placing the acute accidents determined by the passage of gall-stones through the excretory ducts of the liver in the great group of colics, which, as you know, are properly defined as the painful contractions of mucus tubes which have a muscular layer. When a gall-stone is formed, either it produces no marked

symptoms, as I have before said, or it gives rise to two orders of phenomona, viz.: the acute painful symptoms of hepatic colic, or, as is sometimes the case, a train of obscure symptoms with slow evolution and often of difficult diagnosis. Sometimes there is an inflammation of the bile-ducts and gall-bladder sufficiently intense to give rise to peritonitis of a more or less spreading character; in other cases less well known (and it is for this reason that I mention them), the pain is so severe as to produce lipothymia and fatal syncope. Hepatic colic may be preceded by prodromes, vague pains, cramps of the stomach, weight in the hepatic region; but often it begins suddenly by a pain which appears with or without appreciable cause, several hours after a meal. This pain rapidly attains its maximum. It is atrocious, paroxysmal; it compels the patient to cry out. According to Durand-Fardel, the maximum of this pain is in the right hypochondriac region; according to Senac, on the contrary, it is in the epigastrium, and it is from this region that the pain radiates to the sides and posterior part of the body, to the vertebral column, to one or both shoulders, etc. The patients are taken with extreme restlessness; they do not find any comfortable position in bed. There is one position to which Durand-Fardel calls attention, which they seem to prefer, viz.: the sitting posture, with the body bent forward, the head resting on the knees. At the beginning of the paroxysms you sometimes observe a severe chill, epigastric distress, with vertigo, nausea, and vomiting, first of food, then of bile; sometimes also the patients may have convulsions, hysterical attacks, etc. Coincidentally with the first attack jaundice may appear; it is, however, sometimes wanting, especially in mild cases; it is variable both in intensity and extent, may remain limited to the sclerotics, to the circumference of the nose, or mouth, or may invade the whole body. During the entire attack, you observe little or no change in the pulse and temperature. Pressure over the liver is painful, and it is with difficulty that by palpation and percussion you can detect congestion of the organs. After the attack, the patients suffer from general lassitude, which is in ratio of the intensity of the attack; there is often, also, want of appetite, nausea, and vomiting; the bowels are always constipated; the urine is of deep wine color, and contains the coloring matter of the bile.

"Out of one hundred observations, Senac found sixty-five in which the only symptoms were of a gastric order:

Cramps of the stomach	26
Gastralgias	26
Dyspepsia	19
Pain in the epigastric region and in the back	3
Pain in the stomach and liver	3
Hepatic pains	7
Sudden onset of the affection by well-marked hepatic colic	15
Cases where the existence or absence of prodromes was not mentioned	7
	100

"To these gastralgic phenomena we may add another symptom quite as characteristic, namely, the appearance of remittent febrile attacks. Senac, who is so excellent an authority on these subjects, has shown that these intermittent attacks appear between 4 and 6 o'clock in the afternoon. They are accessions of little intensity, but in some cases, as Charcot has pointed out, they may take on the character of real pernicious paroxysms like those seen in the worst forms of malaria. We have here something very similar to what takes place in connection with states of the urinary passages when you catheterize certain individuals. You well know that febrile attacks of an intermittent character are often thereby provoked. It is the same with the bile-ducts, where the presence of foreign bodies is the occasion of similar reflex symptom. I can affirm the reality of these facts; so whenever you have a patient with the symptoms of painful dyspepsia, in whom you observe a slight febrile movement coming on between 4 and 5 o'clock in the afternoon, especially if you notice a slight jaundiced hue which may be scarcely appreciable; moreover, if you find the region of the gall-bladder sensitive and pain produced on pressure, you are warranted in affirming the presence of gall-stones. (Dujardin-Beaumetz on Diseases of the Liver.)

One of the most interesting and practical of the papers that have recently appeared treating of gall-stones is by Dr. Seymour, of Troy, N. Y., who was a victim to this disease and was successfully operated on by Dr. Tait. He watched the symptoms in his own case, with some interesting results. The attacks of pain were preceded several days, he says, by clay-colored stools, which continued several days after. In some instances, however, bile appeared in the stools an hour after an attack. He observed jaundice but twice in his case,

although he had several hundred attacks. Jaundice need occur only when the duct is completely obstructed. He did not have the shoulder pain, and thinks it of slight diagnostic importance. I do not think so, for nearly half my cases have had it. He also observed that the gall-bladder was tender on palpation several days before an attack. His observation that the pain is generally in the epigastrium accords with my experience. Dr. Tait operated for a contracted gall-bladder, and besides some grit found 114 stones.

Osler's experience, relating to the remittent chill and fever connected with gall-stones, is similar to that of Senac. Theirs was hospital experience. It is only when there is suppurative inflammation of the gall-ducts that this fever appears. In nearly one hundred cases of gall-stones I have met with it but twice. Next to morphine and atropine, Dr. Seymour values dioscorea as a palliative of the pain. He found relief from hot baths, which is the general experience.

Treatment of Gall-Stones.—The treatment should fulfil the three following indications:

(1) To meet and allay the symptoms caused by the presence of the calculus.

(2) To attempt the solution of the calculus.

(3) To prevent their formation.

Treatment of the Colic. — The question here arises, Should we treat the colic at all? The reflex and painful symptom of the colic are caused by the passage of calculi through the gall-ducts; this passage is necessary; it is the only natural means of getting rid of the trouble. We might ask the same question relating to the passage of renal calculi through the ureters, or the passage of the child through the genital passage during labor. If we understand by the phrase "treating the colic," to oppose the passage of the calculus and its movements towards the intestine, the answer would be, No, just as it would be wrong to oppose the passage of the child out of the uterus. But if by "treating the colic" is meant to render the transit of the calculus as easy and painless as possible, we should certainly try to do so. I believe the opinion of all schools is favorable to methods and medicines directed towards this result.

The question is, What shall we do? I believe nearly all the old school, and many of ours, have decided that there are three great

therapeutic agents to be employed: (1) morphine and atropine, (2) chloroform, (3) antipyrine. In our school belladonna, cinchona, calcarea, hydrastis, and nux vomica.

Morphine and Atropine.—This combination seems to be the best for the relief of the agonizing pain and spasm of the ducts. The best method is by hypodermatic injection, because it acts quicker, and causes few if any unpleasant symptoms. The dose may be as low as one-fourth of a grain of morphine and one-hundredth of a grain of atropine. Relief will be experienced in fifteen or twenty minutes, and the dose may not have to be repeated. Curiously enough this method has met with the determined opposition of Senac, an eminent French old-school physician. His argument against it is the same as that of its opponents in our school, namely: "The contraction is necessary to the transit of the gall-stone, and by morphine injections you hinder the passage of the calculus into the intestine, and thus you retard the cure of your patient." Per contra, Dujardin-Beaumetz, who has had an immense clinical experience, says: "Never (and I emphasize the word never), in innumerable cases of hepatic colic have morphine injections appeared to prolong colic, and relief from pain is always obtained. The explanation seems simple enough. We recognize the fact that morphine, like atropine, opposes, to a certain extent, spasm of unstriped fibres, but who will say that when this spasm exceeds certain limits, instead of favoring the passage of the calculus it does not arrest it in its course by excess of contraction?" Remember that this injection should be reserved for cases of great intensity, just as we often reserve chloroform for cases of painful labor, in which the uterine pains are so violent and tetanic as to hinder the birth of the child.

Chloroform often gives great relief in the violent spasmodic pains of gall-stone colic. Give it as follows: from ten, twenty, or thirty drops on a handkerchief, and let the patient inhale it, ceasing when the spasm is mitigated, and repeating the inhalation as often as it returns. I have seen good results from chloroform water, a teaspoonful every ten or fifteen minutes. One of my most intractable cases got more relief from chloroform water and phosphate of codeine, one-tenth of a grain of the latter to each teaspoonful of the former, a teaspoonful every fifteen minutes. After three or four doses the pain always subsided. In a few cases I have injected hypodermat-

ically one-half of a grain of phosphate of codeine with good effect. It is useful, when, from idiosyncrasy, morphine is not well borne. Germain See praises hypodermatic injections of antipyrine, but it is not now favorably considered. The preparation known as chlorodyne, in doses of fifteen drops, repeated if necessary in half an hour, is a favorite with English physicians. In cases where the shock of the pain causes fainting, collapse, and coldness, I would recommend inhalation of amyl, or a dose of glonoine, one-fiftieth or one-hundredth of a grain on the tongue. Remember that the above anodynes are for violent cases where relief is urgently demanded, and we feel obliged from motives of policy or humanity to accede to such demands.

These attacks of colic may come on regularly or not, and may simulate dyspeptic pains coming on after eating. If the calculus is expelled from the duct the pain ceases immediately; but if the spasm relaxes without expelling the stone, the pain ceases gradually. Now as to the treatment of our school. I know of no homeopathic medicine that will give immediate relief. I know that in many cases immediate relief from the pain has occurred while the patient was taking belladonna, nux vomica, and other medicines in attenuated doses, but we do not know that the medicine given caused immediate relief. The relief was caused by the escape of the stone from the duct, which may occur under all circumstances, unaided by any drug. We are all glad to have our patients believe that the medicine gave them prompt relief, but we should not report these cases as proof of its effect. Medical reports are too full already of these false assertions. I have in my mind several reports of rapid relief in hepatic colic, from calcarea carbonica 200th, belladonna 30th, and cinchona 30th. This last medicine was highly vaunted by Dr. Thayer, of Boston; his selection of this medicine being based on the periodicity of the attacks; but I do not consider such an indication, in hepatic colic, of any value whatever.

Dr. Burnett, in his "Greater Diseases of the Liver," reports many cases of hepatic colic. He says of hydrastis that he has found it the best of remedies for gall-stone colic. He gives ten drops of the tincture in hot water every half hour, and has known it to succeed after everything had failed. "In one case the patient had lain for forty hours in terrible agony, unrelieved by any known thing."

The colic ceased while he was taking hydrastis; but did the medicine expel the stone, or was it just on the point of being expelled?

Myrica cerifera he thinks cured a case of hepatic colic "in a week." Chelidonium perhaps has the highest claims of all as an aid in the expulsion of gall-stones. It was Rademacher's great gall-stone remedy. Buchner reports many cases of gall-stones expelled under its administration. I find no reports of immediate relief of hepatic colic from its use, but there is ample proof that it aids in the expulsion, and prevents their formation. I believe this is due to its peculiar action on the hepatic cells, causing them to secrete a thinner and more profuse bile. I have treated many intractable cases when the stones had remained in the duct several months,— in one case a year,— and when the icterus was intense, the whole body, eyes, tongue, lips, and vagina, had assumed a greenish yellow hue. Several of these cases did not improve until chelidonium was given, and under its use the calculi were discharged. In one case the stone was an inch and a half long, and half an inch in diameter, and in shape like a dumb-bell. In two cases which simulated pernicious intermittent, in which the paroxysms of pain and fever occurred every evening, and quinine had been given before I was called, gelsemium arrested the paroxysm. A colleague who consulted me for a similar case tried Dr. Thayer's cinchona 30th without results, but succeeded with gelsemium.

Dioscorea was a favorite remedy for bilious colic with the early botanics and eclectics, and I have seen apparent benefit from its use in infusion and decoction. I was surprised to find that Professor Goss, in his "Practice," does not mention it in this disease. He mentions it in spasmodic and flatulent colic, and the action of the drug in such cases ought to make it a remedy for spasm of the gall-ducts. Berberis has some reputation, but I have never tested it.

Olive Oil.— This oil was recommended for the treatment of gall-stones by one of our school about thirty years ago. I first used it in 1866, in the case of a young woman who had been jaundiced for nearly three months, during which she had suffered from violent attacks of hepatic colic. Nearly every indicated remedy had been used without removing the impaction. I ordered at night a teacupful of oil. The next morning she passed several gall-stones of the size of playing marbles. When broken they presented a beautiful

stellar crystalization. A prompt and permanent recovery followed. Since that time I have prescribed it with varying results, often curing many cases of long standing and as often failing in others. The cause of these failures cannot be explained.

The value of this oil is disputed by some. Osler says, "Olive oil has proved useless in my hands." But his experience, if we are to judge by his book, has been mainly in hospitals, and not so much with simple impaction as inflammation of the gall-ducts. Another cause of doubt in its efficacy is that the greenish-yellow masses, from the size of a pin-head to a grape, which appear in the stools after taking the oil, are not really calculi or biliary concretions, but are composed of saponified oil and contain no cholesterine. Doubtless many of the reported cases of supposed expulsion of gall-stones from the administration of the oil were based on these pseudo-concretions. Quacks and charlatans have made use of these oily masses to convince patients of their skill. Dr. Porter, of St. Louis, sums up his arguments against the oil as follows: "(1) The mucous membrane of the biliary ducts cannot be coated with oil. (2) No positive diagnosis of gall-stones can be made unless the stone is found in the fæces." To this I reply that the oil can enter the gall-bladder by capillary attractions through the common duct, and that there are undeniable cases on record of veritable gall-stones found in the stools soon after taking the oil.

Professor Germain Sée, whose opinions few will care to dispute, is a firm believer in the efficacy of olive oil in the treatment of gall-stones, and explains its action by supposing that the fatty acids contained in it dissolve the cholesterine of the gall-stones. Dr. Rosenberg reports the following case: "A patient suffering from marked biliary colic, that had continued for five years, and had proved refractory in spite of all treatment, including a 'Trinkkur' in Carlsbad, and in whom the pain was very acute, was given a dose of 100 grammes of olive oil (about three ounces) at night. In the morning there were found in the stool three concretions, one the size of a grain of linseed, the other two smaller. Some days later a second dose was given of 180 grammes, and in the stool that followed 180 concretions were found, varying in size from a pin-head to a hazel-nut, and after a third dose 243 stones. The patient's troubles soon after this began to diminish, but they did not entirely disappear.

She took in all, in five doses, 820 grammes of olive oil, and 629 stones were counted in the evacuations that followed. The gall-bladder, which before was the size of the fist, and projected beyond the edge of the liver, diminished so far that it could be no longer palpated. It was assumed that the oil did not act by exciting peristalsis of the intestines, but by passing directly into the gall-bladder and softening the contents." Now it is not supposable that an educated medical man could mistake rounded masses of saponified fat for gall-stones; and, besides, the change effected in the gall-bladder would be proof, without finding the stones. Drs. Mayo and Bloom, of Philadelphia, received in answer to circular letters inquiring for cases of gall-stones treated with olive oil, reports of thirty-seven cases. An analysis of these cases seem to show the positive value of the oil. I do not know that it is necessary to use pure olive oil; perhaps any vegetable oil would be as good, and possibly better. I would suggest a trial of cotton-seed oil, peanut oil, sunflower oil, the oil of sweet almonds, and other oils.

If further proof is wanted of the value of oil, Dujardin-Beaumetz, in one of his papers on the treatment of gall-stones, writes as follows:

"But I desire to call your attention particularly to a new medicinal agent—I refer to olive oil. It is to the homeopathic physicians, who have, it must be admitted, introduced a number of new medicines into the materia medica, that we are indebted for our knowledge of the utility of olive oil, given in large doses, as a remedy for hepatic colic. It is now almost twenty years that this treatment has been in vogue. In recommending olive oil in this affection, it might seem that they were in part faithful to their doctrine, in combating gall-stones constituted essentially of cholesterin, a fatty body, by another fatty body, — 'similia similibus.' At the same time, note that they employed it in large doses, which is hardly consistent with the Hahnemannian doctrine.

"From the United States, this method passed over to England, and was there adopted by several regular physicians, and among them Kennedy, Thompson, and Singleton Smith. In France it was not till after the publication of Touatre in 1887, that we commenced using this remedy, and Chauffard and Dupré, in 1888; Martial Durand, of Bordeaux, in 1889; Huchard, Germain Sée, and Mar-

ciguey, in turn published favorable results. All these clinical facts have, moreover, been summed up in an excellent paper by one of my pupils, Dr. Willemin, of Vichy, from which I borrow the more important points respecting this mode of treatment. To-day the facts are sufficiently numerous to warrant us in affirming that olive oil in large doses is one of the best means of combating the painful phenomena determined by the presence of calculi. It arrests almost instantly the severe acute pains, and diminishes considerably the period during which the patients suffer dull pains, prostration, and discomfort. Failure constitutes the exception, and what is strange, the large quantity of oil is well borne and the patients do not vomit. I say large quantity, for you must give in one dose 200 grammes (or nearly a tumblerful) of pure olive oil, and, in order to do away with its disagreeable taste, you can order the patient to rinse the mouth with brandy and water, or to suck a little orange juice. In my own practice, to the olive oil I add bile, and with 200 grammes of oil I combine twenty grammes of ox-gall. This mixture is slightly bitter, but it is well tolerated by the patient, and the results have been the same as with the oil, so that it is difficult for me to credit to the bile what really belongs to the oil in these cases. I was led to employ ox-gall by the researches of Provost and Binet, who have shown that this substance is a powerful cholagogue. We are still ignorant of the real mechanism of the therapeutic action of olive oil. Touatre maintains that the oil always causes expulsion of the calculi. We know to-day the cause of this mistake. Touatre confounded with gall-stones certain oily concretions resulting from the incomplete digestion of the ingested oil. It is difficult to admit that the oil acts directly on the calculi, for we cannot conceive of its passing into the bile-ducts. Stewart maintained that the oil broke up into fatty acids and glycerine, and that the latter produced in the intestines reflex movements favoring the issue of the calculus. Others, and in particular Rosenberg, considered the oil as a powerful cholagogue, and it is this cholagogue action which explains the favorable effects of the oil. Lastly, we may suppose that the oil has a direct action on the orifice of the ductus communis choledochus and corresponding duodenal region, which tends to diminish the reflex spasm, which is the first cause of the colic. For my part, I am ready to adopt the opinion of Willemin, who thinks that the large

doses of oil act in several ways: first, as a cholagogue, then in diminishing the reflex action, and lastly in favoring the descent of the calculus into the intestine by their laxative properties. However this may be, the number of favorable facts is to-day so considerable that before having recourse to the injections of morphine, you ought to always make your gall-stone patients take a full dose of 200 grammes of olive oil, with or without the addition of the ox-gall."

Glycerine. — Dr. Ferrand ("Le Bulletin Medicale," No. 20, 1892), induced by the ease in which glycerine dissolves various substances, and especially the majority of coloring matters, tried it in the treatment of cholelithiasis.

"Experiments, however, have proved that the drug is not lithotriptic, yet, used in practice, it has shown itself to be a precious remedy in the treatment of gall-stones. If administered during the attacks it causes them to disappear rapidly. Experiments on animals have demonstrated that glycerine, given in small doses, is well berne by the stomach, is soon absorbed by the gastric mucous membrane, and enters into the lymphatic circulation without difficulty. From here it gains the lymphatic plexus of the liver and gall-bladder, causing a copious secretion of liquid bile, with which the gall-stones are swept out. Glycerine leaves the liver through the blood-vessels, as many experiments have demonstrated. Hence it is a true cholagogue, and indeed a direct one, as it penetrates into the liver through the lymphatic vessels, and by the same route is poured into the gall-bladder. It exercises here, as well as in the liver, its characteristic hydroscopic action. A comparison of its action with that of olive oil is of interest, for this latter has long been used successfully in cholelithiasis. The action of the oil may be due to its decomposition into fatty acids and glycerine. This latter is the substance which acts in promoting the secretion of bile. Therefore it is better to give glycerine itself instead of the oil, as its action is more direct, surer, and can be more certainly dosed. The employment of glycerine varies. If one desires to abort an attack of gall-stone colic, twenty to thirty grammes (five drachms to one ounce) will be found sufficient, and may be repeated for several days in succession, which, however, is seldom necessary. During the attacks it may be given every morning in doses of from one to three teaspoonfuls in a half a glass of some alkaline water. Larger doses are best given in cherry

laurel water, to which twenty-five to thirty grammes (six drachms to one ounce) of chloroform water are added, which latter exercises a sedative action on the gastric mucous membrane. To this any syrup may be added, and the mixture is given by the teaspoonful every hour, or it may be administered in larger portions. Even if given for a long time, glycerine does not have any injurious action; on the contrary, it prevents the usual constipation from the alkaline water."

The Solvent and Preventive Treatment.— There are some remedies that have a reputation as solvents of calculi in the gall-bladder. But many authorities deny the possibility of such an action. The most popular remedy, especially in France, is the mixture of turpentine and ether, half a teaspoonful every morning, or every night and morning. This mixture is so repulsive to most patients that Trousseau advises giving one capsule of turpentine (fifteen drops) and two of ether (thirty drops) several times a day. Several years ago I tried this in some cases, but could see no beneficial results. Dujardin thinks it had better be discarded as well as the terebinthinate soap of Durand. Choleate of sodium and the succinate of iron is highly praised by Buchler, of Baltimore, Md., and many physicians claim to have given it with benefit.

The plan I recommend, while the medicines are not themselves solvents, are agents which modify the character of the bile. These medicines, namely, that cause the hepatic cells to secrete thin and normal bile, which prevents the formation of calculi. The medicines having such action are chelidonium, carduus, iris versicolor, euonymin, and natrum sulphuricum.

Chelidonium causes the liver to secrete thinner and a more profuse yellow bile than any other drug. No one can read the provings, the clinical experience of Rademacher, Burnett, and many others without being convinced of this, and of its great influence for the prevention of biliary calculi. In many cases I have greatly aided the expulsion of gall-stones by its use; the thin, profuse biliary secretion caused by it washing them away. The dose need not be large, in fact very large doses of this as well as of all cholagogues cause a suspension of the bile-secreting process.

Rademacher, who was one of the first to use chelidonium (although it has been used in domestic practice in Germany for centuries), gave

very small doses, one drop five times a day in most cases. He says he gave at first thirty drops, but found from experience that smaller doses acted better. The tincture he used was made of the expressed juice of the plant and alcohol, equal parts. Burnett gives material doses, five to ten drops several times a day, for gall-stones. It is proper to use the 3x or 6x dilution for bilious diarrhœa, or acute congestion of the liver, for in such cases we have its primary action, which calls for minute doses.

Carduus has a similar action on the liver, but it cannot be substituted always for chelidonium because its concomitant symptoms are different. The dose is the same as that of chelidonium.

Iris versicolor and its active principle iridin, causes very thin, yellow bilious discharges, with vomiting of the same. I believe I have prevented the recurrence of gall-stones many times by its continued use. The most efficient dose for this purpose is five to ten drops of the 1x or tincture, or a grain of the 1x or 2x of iridin, several times a day. The headache and acid condition of the secretions of the digestive tube are the chief indications.

Euonymin seems to be preferred by European physicians. Dujardin and Sée recommend it highly, because it does not irritate the stomach or cause diarrhœa. They give one grain at night, which may act as a slight laxative. I prefer the 1x trituration, giving one grain (in tablet) three or four times a day, before meals and at night. It is especially indicated when, with or without the jaundice, there is a stupid headache, generally in the occiput, the urine being saturated with uric acid, and the digestion bad. Podophyllin, myrica, hydrastis, juglandin, aloe, sanguinaria, leptandrin, thaspium, and phytolacca may be indicated if their guiding symptoms are present.

Prof. Germain Sée, of Paris, praises salicylate of sodium, not only for the prevention of biliary calculi, which it does by "augmenting the watery part of the bile," but as an analgesic remedy during the paroxysms of pain.

Phenacetin is much better for the pain. We do not know how it acts upon the secretory functions of the liver, probably not at all, any more than does antipyrin, antifebrin, or others of that class.

Dr. Burnett is very likely the first to use thaspium bursa pastoris in biliary calculi. He says it quickly relieves the pain, and may dissolve the biliary, as it does renal calculi. He insists that it is

indicated "when the original liver ailing started in the womb." Perhaps it would be better to say when the biliary alternated with renal calculi, as is often the case.

Dujardin-Beaumetz says: "The really curative treatment of biliary lithiasis is the thermal treatment, *i. e.*, by the natural alkaline waters; and there are two spas especially the waters of which are efficacious in these cases: I refer to Vichy and Carlsbad." Morgan (in "Diseases of the Liver") recommends them in connection with homeopathic treatment—and very properly, as they aid greatly the action of the indicated medicine. All medical authorities agree that these and similar waters do not act by dissolving the calculus, but by regulating the digestive function, diminishing the hepatic congestion, and by modifying the bile itself. Foreign physicians seem to select the water to suit certain conditions of the patient. They advise Vichy to some because of the large quantity of bicarbonate of sodium it contains. The "Hospital" Spring is preferred for biliary lithiasis—a tumblerful four times a day. Other patients they advise to take Carlsbad on account of the sulphate of sodium (natrum sulph.) it contains. The "Sprudel" is preferred.

In this country we have waters which resemble both; the Congress of California, Saratoga, and Lansing resemble Vichy. The saline springs of Virginia and Florida, and the "Carlsbad" of Colorado. The imported powdered Carlsbad salts are composed mainly of sulphate of sodium and bicarbonate of sodium, and, when taken in connection with proper diet and medicines, are as efficient here as Carlsbad water is. In most cases I advise a teaspoonful of Carlsbad salts in the morning in hot water, and fifteen grains in hot water before meals. If the stomach is acid all the time, I advise a glass of Vichy after meals.

In many cases I prefer the phosphate of sodium to either of the other sodium salts. It removes acid indigestion, thins the bile, making it profuse and alkaline, and has some tonic effect on the nervous system which the others have not. One drachm in the morning before breakfast, and ten grains before or after meals, is the most efficient dose.

The diet is the same as that recommended for lithæmia. Sugar or starchy foods in small quantities. Fatty foods, especially bacon and butter, in moderate quantities. Milk, while advised in simple

jaundice, is not advised in this condition. The dry crust of bread or zwiebach is preferred to bread. No new bread should be eaten. Eggs and meat in small quantities. Fresh vegetables and legumes are advised, and all acid fruits except tomatoes.

The "grape cure" is credited with curing some cases. Acid fruits change in the stomach to alkaline compounds, and all alkalies prevent that undue acidity of the bile which leads to the precipitation of cholesterine. As an excess of cholesterine shows a breaking down of the nervous system, all intense mental emotions or nervous strain should be avoided. All fresh fish, except shell fish, may be eaten. All liquors, except the dryest wines, and all high-seasoned soups and other dishes should be avoided, as they tend to cause catarrh of the stomach, extending to the ducts, where it has a tendency to lead to the formation of calculi, by arresting the free flow of bile. Active exercise in the open air, and the wearing of wool garments next the skin all the year, are indispensible aids to a cure.

Dr. W. C. Van Biber reports five cases (Trans. of the Medical and Chir. Faculty of Md.) to show that choleate of sodium may act as a substitute for the bile when this secretion does not enter the duodenum. This he considers to be most desirable in cases of chronic jaundice. In these cases the use of the remedy improved the digestion, and the author's theory is that it acted as a substitute for the bile. In none of the cases did an attack of the colic occur during its administration. He recommends choleate of sodium in certain cases of dyspepsia, dependent on functional derangement of the liver; and in chronic jaundice, when it is evident that a sufficient amount of bile is not poured into the duodenum. In the former he considers that it will be quite as serviceable as pepsin is in other forms of indigestion, on the principle of supplying a substitute for a physiological secretion. He refers also to the use of the choleate, as proposed by Dr. Dabney, as a preventive of the formation of gall-stones.

NOTE.—I have named the European Carlsbad water; the American Carlsbad of Colorado; and all springs containing sulphate of sodium (natrum sulph.) as best suited for lithæmia, gout, and gall-stones. The European Carlsbad contains twenty-five grains to one pint; the Colorado, ten grains. Of carbonate of sodium, the European Carlsbad contains seventeen grains; the French Vichy, forty-seven grains; the Saratoga Vichy, ten grains; the Colorado Carlsbad, one-third of a grain; the Vichy of California, twenty-five grains; the Pacific Congress springs of California, fifteen grains. These two last most nearly resemble the French Vichy.

ACUTE HEPATITIS.

This is a very rare disease in temperate climates. It sometimes occurs in our Southern States, is frequent in the West Indies, especially among Englishmen, who do not conform their habits of life to suit the climate. It is frequent also in India, and it is from the physicians of that country that we get the most accurate accounts of the disease. Some of the causes are blows on the region of the liver, indigestion, rapid chilling of the body while sweating, sudden suppression of perspiration by excessive drinking of or bathing in cold water, etc.

Dutrouleau, who gives the best description of the disease, says: "The endemic hepatitis of hot climates passes through different stages which have their distinct characters. To the three anatomical characters, congestion, inflammation, suppuration, correspond certain symptoms which give to the disease a special physiognomy. To the form which is the most mild has been sometimes given the name of the dominant symptom, "liver ache" (point de cote); the denominations and acute chronic hepatitis indicate the disease arrived at the stage of phlegmasia, corresponding to these two forms; abscess of the liver indicates the disease gone on to suppuration."

The pain in the side corresponds to active hyperæmia. Sometimes suddenly, after fatigues or excesses, the patient is taken with an excruciating pain in the right side, exasperated by pressure and strong inspirations. This pain by degrees becomes less, then disappears, to return after the least fatigue or excess. Sometimes the disease is confined to this one symptom, and the patient gets well; if it continues its progress, it soon goes on to the second and third stages. Habitually, the hepatitis begins by an accession of fever with a chill, heat, and sweats; then supervenes an excruciating, lancinating pain, which obliges the patient to writhe and draw himself up in his bed; at the same times there is a considerable difficulty of breathing, which auscultation does not sufficiently explain. When the crisis is passed, the patient still experiences the pain, which is less intense, and which almost always corresponds to an inflamed point in the liver. Dutrouleau attaches a great importance in diagnosis to a sympathetic pain which the patient sometimes experiences in the right shoulder, and which indicates an inflammation of the

convex surface of the organ. If the patient is to get well the pain little by little disappears, leaving only some soreness behind. If the disease passes to the chronic stage, the pain becomes intermittent, lancinating, while the fever becomes high if the hepatitis goes on to suppuration. Jaundice does not always exist after the crisis; sometimes there is a straw-yellow color of the skin, a simple icteric pallor, with slight discoloration of the sclerotics, the urine is red and scanty, and does not contain the coloring matters of the bile, except when the icterus is intense. When the hepatitis goes on to suppuration the liver becomes tumefied and protuberant, and sometimes bulging is detected at the point where the abscess is seated. Abscesses of the liver are superficial or deep, and are oftener seated in the right lobe than in the left (in 122 out of 136 cases). They differ from metastatic or pyæmic abscesses, which have a brown color, are small, situated at the surface, and do not possess a pyogenic membrane. The abscesses of hepatitis are generally single. Out of sixty-six, Dutrouleau found forty-one in which there was but one; sixteen in which there were two; five in which there were three. Lastly, out of these sixty-six cases, there were fifty-six large abscesses, *i. e.*, the size of an orange at least, and ten small ones. The pus of recent abscesses is brown, the color of wine dregs, sometimes contains blood or the debris of the organ; takes on an ammoniacal, sometimes putrid, odor. When surgical interference is not resorted to, the abscess, if not too large, may get well by absorption; else it increases in size from day to day, and the patient, by reason of the progress of the disease, falls into a profound adynamia, and dies of exhaustion. Under other circumstances the pus dissects for itself a passage externally, or into the neighboring organs, and if there are peritoneal adhesions, it may burrow its way through the abdominal walls; in other cases it bursts into the peritoneal cavity, and causes a rapidly fatal peritonitis. If the abscess opens into the pericardium, death does not long delay, but if it opens into the bronchi, the stomach, or the colon, recovery may sometimes take place. Murchison relates such a case of recovery in a physician whose abscess opened into the bronchi.

In temperate climates what is called hepatitis, or diagnosed as such, may be a pleurodynia, intercostal rheumatism, or pleurisy, which may simulate hepatitis in some of its superficial aspects.

Abscess of the liver, so common in the tropics, rarely follows our simple hepatitis, but is usually the result of dysentery, the ulcerations in that disease determining the passage of septic matters into the portal circulation and the transference of these matters into the substance of the liver.

The treatment of acute hepatitis with high temperature should commence with aconite, or veratrum viride. These will reduce the intense hyperæmia. Their use should be accompanied by copious hot enemata thoroughly to empty the bowels, or the administration of Carlsbad salts, until all morbid matters are washed out of the intestines.

For the excessive pain never use any preparation of opium. If bryonia or chelidonium do not control it, give two or three grains of phenacetin or salicylate of sodium every hour. If the fever is intermittent, coming on in the morning, give eupatorium perfoliatum, gelsemium, or cedron; if in the afternoon, from 4 to 6 P. M., cinchona or lycopodium; quinine or cinchona if the tongue is clean or cleaning.

If extreme high temperature, chills, and sweats occur, denoting suppuration, give hepar sulphur or hypophosphite of lime. It is often possible to prevent suppuration by these medicines.

External applications of poultices, hot-water compresses, mustard, etc., may assist in relieving the pain. The treatment of hepatic abscesses belongs to the domain of surgery. They may break into the intestines, peritoneum, or into the lungs or pleura. Any physician not a surgeon should be ready to open an abscess if danger threaten from it. The aspirators of Dieulafoy or Patain can be used with safety. If in trying to puncture the abscess we do not happen to hit it, but puncture the substance of the liver, no bad result will follow. Physicians in India and in Europe, and in American hospitals, often puncture the liver in engorgements, and great relief follows the withdrawal of blood. I believe that veratrum viride, if cautiously and continuously used for a considerable time, will be more useful than any abstraction of blood. Give enough to keep the pulse down to 60, and no unpleasant symptoms will result, while the amount of blood in the liver will be greatly decreased.

Boldo will act well after veratrum viride, and may be able to prevent cirrotic hardening. The effective dose appears to range from three to fifteen drops of the tincture every four or six hours.

CIRROSIS OF THE LIVER (Chronic Interstitial Hepatitis).

Definition. — A chronic disease of the liver cells, and an overgrowth of connective tissue elements, in consequence of which the organ becomes hard and unusually small. It occurs most frequently in middle-aged males.

The following are the causes: alcohol, syphilis, cyanotic congestion, malaria, tuberculosis, scarlet fever, rickets, and obstructions of the bile-ducts. The two most common causes are alcohol and syphilis.

Yellow atrophy sometimes is a form of cirrosis. The liver may be so small as to weigh not more than one pound. Fatty cirrosis usually occurs in beer-drinkers. In the first stage of cirrosis the liver may be enlarged, but this is due to hyperæmia.

Glissonian, Cirrosis or Perihepatitis. — This form is a consequence of an inflammation of Glisson's capsule, and is usually the result of hard drinking. The two essential elements in cirrosis are destruction of the liver cells and obstruction of the portal system.

Symptoms. — The most extreme grade of atrophic cirrosis may exist without symptoms. This, says Osler, is due to a compensating circulation which may be established. So long as this compensatory circulation is maintained, the patient may suffer little or no inconvenience. Osler describes the method by which this is obtained, mainly by anastomoses.

In the obstructive variety the over-filling of the blood-vessels of the stomach and intestine leads to gastric catarrh, and the patients suffer with nausea and vomiting, particularly in the morning; the tongue is furred and the bowels are irregular. When a man addicted to drink has these symptoms, the liver should be carefully examined. If he has occasional hemorrhages from the stomach or bowels, the case is more suspicious. Evidences of the collateral circulation are seen in the enlarged epigastric and mammary and hemorrhoidal veins. Then acites sets in unless the compensatory circulation obtains. The peritoneal dropsy becomes great, attended by œdema of the legs, rarely a general anasarca. There is sometimes jaundice; the urine is reduced in quantity, and is full of urates, with occasional tube-casts and albumen. At first the liver is enlarged and painful on pressure. Later on, the patient has unmistakable "hepatic facies";

he is thin, his eyes are sunken, the conjunctivæ watery, the veins in the nose and cheeks are distended, and the complexion is muddy. On the abdomen are dilated bunches of veins — around the navel. The liver feels hard and granular, and the spleen is unusually enlarged. The patient may show toxic symptoms due to cerebral irritation, such as noisy delirium, stupor, coma, or convulsions, a condition often mistaken for uræmia. In hypertrophic cirrosis the disease may continue a long time, and be mistaken for obstructive jaundice from gallstones, but as a rule the stools contain a little bile. In the end, fever may set in with temperature from 102° to 104°, with dry tongue, rapid pulse, and petechiæ.

Treatment.— It is not considered a curable disease. We know of no remedies which can remove the cicatricial tissue that has formed in the liver. It is possible that conium, barium, and iodide of gold may do this, but we have no absolute clinical proof. If the patient is seen in the early stage, and will abstain from liquor and improper food, I believe nux vomica, chelidonium, carduus, aurum, nitro-muriatic acid, euonymin, or podophyllin may arrest it. This treatment should be aided by an out-of-door life, and the use of Carlsbad or French Lick water. Burnett believes iodoform may have a curative action.

Boldo, a South American drug largely used by the natives, has been experimented with by Dujardin and Campenow. They believe it has a specific action on the liver, reducing hypertrophy and engorgement, and in a few instances curing cirrosis. Dr. Campenow, in the "Rivesta Medica," writes that he had recently under his care two cases of cirrosis of the liver, characterized by increase of the volume of that organ, dilatation of the subcutaneous veins, and slight ascites, in which he attributes the cure to the use of boldo. He prescribes the tincture of the bark, five drops in a little water a few minutes after eating; six drops are given the second day, and the dose is increased each day until fifteen or twenty drops are given at a dose. When the maximum is reached the dose is diminished daily until the initial dose of five drops is reached. This treatment, in order to cure, should be of long duration.

Osler doubts the possibility of cures. He says: "The so-called cures of cirrosis means the re-establishment of a compensatory circulation, and it would be as unreasonable to speak of healing a

chronic valvular lesion, when with digitalis we have restored the compensatory balance, as it is to speak of curing cirrosis of the liver, when by tapping and other measures the compensation has in some way been restored."

Pronounced ascites should not be allowed. It ought to be removed by tapping, if apocynum, diuretin, eupatorium, purpureum, or some similar drug will not act. In several cases I have kept the dropsy down by the use of Epsom salts, elaterium, jalap, and calomel (merc. dulc.). In one remarkable case, when the patient was in a dangerous condition, the ascites and œdema of the legs were entirely removed by calomel, two grains every three hours. The urine, which was almost suppressed, increased enormously on the third day, after copious watery evacuations from the bowels, the man remaining free from the dropsy for a year, when a second attack was removed by the same means. Osler reports a case of syphilitic cirrosis, in which tapping had been performed eight times: "The man was then given the Niemeyer pill of mercury, squill, and digitalis. He took this pill for a year with the greatest benefit, and subsequently had four years of tolerably good health."

Burnett ("Greater Diseases of the Liver") records some cures of probable cirrosis of the liver, after the use of chelidonium, carduus, myrica, and leptandrin.

Seminola insists upon a milk diet, abstinence from alcohol, and an out-of-door life.

Phytolacca may be useful in cirrosis with fatty liver. Iodine has been recommended, but its value is now doubted.

FATTY LIVER.

As in fatty heart, two different forms are recognized: the fatty infiltration, and fatty degeneration. These forms are generally associated with general obesity, in which the liver appears to be one of the storehouses of excessive fat. In the latter the oxidation processes are interfered with, as in cachexia, anæmia, and phthisis; it often occurs from alcoholism.

The symptoms are not definite, and it is difficult of diagnosis. Jaundice is never present; the stools may be light-colored, but even in the worst cases the bile is still formed. The liver may be greatly

enlarged, reaching below the navel, but it is smooth and painless.

Treatment.—It is well known that phosphorus, iodoform, arsenic, and some other drugs will cause fatty degeneration. Surely one of these drugs ought to cure it in its first stage, but we have no clinical reports of their use. In fatty infiltration the general treatment recommended for obesity should be carried out rigidly, if the disease is not too far advanced.

CANCER OF THE LIVER.

This is rarely a primary disease; is usually secondary to cancer in other organs. It may arise from a blow or bruise of that organ, or be caused by gall-stones. There are several varieties: the massive, involving the whole liver; nodular, scattered throughout the organ; and cancer with cirrosis. Sarcoma of the liver has been known to occur, but is supposed to be rare.

The diagnosis is difficult, unless there has been cancer in other organs. Then if enlargement of the liver occurs, with the wasting and marked cachexia, it may be put down as cancerous.

Treatment.— There are no cures on record; conium, hydrastis, arsenic, and phytolacca may be tried. But the main treatment must be alleviative, the medicines being selected according to their symptoms.

Dr. Burnett says he believes he has twice cured cancer of the liver with cholesterine, 3x trituration, also a "tumor of the liver."

DISEASES OF THE PANCREAS.

Diseases of the pancreas have been involved in a great deal of obscurity. Until the time of Professor Classen, who wrote in 1842, nearly all our knowledge was theoretical. His observations were based on post-mortem appearances. He quotes earlier writers — Schmackffeffer, Neuman, Juppin, Casper, Raku, Morgani, and gives their observations. The first named examined a woman who died of mercurial poisoning. He describes the pancreas as "unusually dense, dry, and very much swollen; it was red and inflamed throughout; numerous drops of blood escaped from the cut surface. The

duct was very much dilated, especially at its mouth. The gland weighed five and three-fourths ounces." Classen gives the symptoms of acute pancreatitis as follows: "Deep-seated pain near the stomach, producing a peculiar anxiety, restlessness, frequent fainting. The pains bear no definite relation to the vomiting or other symptoms, and were not increased in proportion by external pressure. The vomiting is forcible, more or less greenish material being expelled. The abdomen is moderately tense, there is slight fever, and the appetite is but little disturbed. There is moist tongue, thirst, and constipation." But these symptoms may occur in many other diseases.

The best papers on Diseases of the Pancreas are those by Professor Fitz in the New York "Medical Record," 1889, and a paper prepared for the Pennsylvania State Homeopathic Medical Society in 1880, by a committee composed of Drs. J. C. Morgan, A. R. Thomas, A. Korndoffer, and E. A. Farrington, and republished in Arndt's "System of Practice."

ACUTE PANCREATITIS.

This may run its course, and resolution take place, without being recognized by the physician, who supposes he is treating a gastritis or gall-stones.

Severer cases are called "acute hemorrhagic pancreatitis," and are described as follows by Osler: "The symptoms of this condition are remarkable. The attacks set in with violent pain in the abdomen, usually in the upper zone, but in some instances it is general. Nausea and vomiting are present and usually constipation. Tympanitic distension of the abdomen is of frequent occurrence. Fever may be present, but it is an inconstant symptom. There may be early delirium. Collapse symptoms supervene, and death occurs usually from the second to the fourth day, or even earlier. The swelling and infiltration in the region of the pancreas necessarily involve the cœliac plexus, and the stretching of the nerves may account for the agonizing pain and the sudden collapse. In a case which I have reported the semilunar ganglia were swollen, the nerve-cells indistinct, and there was an interstitial infilitration of round cells. The pacinian corpuscles in the neighborhood of the pancreas were enormously swollen and œdematous."

In such cases a diagnosis of obstruction, or acute perforative peritonitis, is usually made. In one case in which a correct diagnosis was made by Fitz the patient was suddenly seized with severe pain in the epigastrium followed by vomiting and prostration. The abdomen was distended, temperature slightly elevated, and the bowels were constipated. Laparotomy revealed no obstruction, but an acute hemorrhagic pancreatitis. Osler relates a similar case of a patient in the Johns Hopkins Hospital. No obstruction was found, but the pancreas was swollen, indurated, and inflamed.

SUPPURATIVE PANCREATITIS.

In this form there may be diffuse suppuration, or the organ may be studded with small abscesses. Of the twenty-two cases analyzed by Fitz, the majority occurring in adults under forty, seventeen were males. The disease is usually chronic, and begins with epigastric pain, vomiting, and prostration. Tenderness exists in the epigastrium, or may at times extend to the left and be quite sharply localized over the position of the pancreas, but a circumscribed tumor is rare. I believe I recently had a case of this kind. Mr. M. had suffered for several months from these symptoms, and had been treated for dyspepsia. On examination, palpation discovered no perceptible tumor. Auscultation showed a blowing sound in the epigastric region, confined to a small space just below the zyphoid cartilage. At first I thought it was an aneurism of the descending aorta. The heart was normal. On examining him in the knee-elbow position, the blowing sound disappeared. He could not walk or ride, or lift anything, without causing great pain in the region of the blowing sound. The pain would radiate upward into the chest, shoulders, back, and downward. There was a sensation of deathly sinking at the pit of the stomach. No undigested fat was found in the stool, but there was progressive emaciation. No medicine (I tried muriate of barium and iodide of potassium) or diet seemed to improve his condition. He crossed the lake from Chicago to St. Joseph, and shortly after he arrived was attacked with symptoms like cholera morbus, and came near dying. Blood and pus were found in his stools, and he vomited a large quantity of fluid resembling chyle. After his recovery from this attack there was a general improvement in his condition. A few weeks

after his return an examination was made with the following results:

The blowing sound was present, but in a much less degree, and was more circumscribed. His general condition is much improved. He is gaining weight and strength, but if he becomes fatigued he still has some of the old pain. I believe a large abscess in the pancreas discharged into the duodenum.

Treatment.— In acute pancreatitis, I can suggest no better remedies than mercury and iris versicolor. We know that both medicines have caused it (see Schmackffeffer's "Report"; Dr. Burt found the pancreas in a cat inflamed after poisoning by iris). Both drugs have in their pathogenesis nearly all the symptoms of acute pancreatitis.

Jaborandi, or its alkaloid, pilocarpin, which have such an intense stimulating action on the salivary and other glands, ought to be excellent remedies in this disease. It would be particularly indicated in the metasatic variety caused by suppression of mumps or an arrest of mercurial or other salivation. Enough in such cases should be given to restore the flow of saliva.

Muriate of barium has many of the symptoms of chronic pancreatitis. A case is reported in "Frank's Magazine," quoted by Morgan, cured by this remedy. The details are as follows: "A young man, about thirty years old, has been subject for a long time, several times a day, and also in the night, to such violent attacks of distress and suffocative spells that he was obliged to roll about on the floor, after the fashion of an epileptic, save that he retained consciousness. He was compelled to sit absolutely straight, his head bent forward, a constant stream of saliva running out of his mouth. This flow of mucus occurred with even slight paroxysms; it seemed most like saliva, of which a soup-plateful would run from the mouth. In the left side, a trifle below the stomach, a hard substance could be detected, and the patient affirmed that he has always been conscious that his paroxysms came from that spot. After attempting in vain to secure relief by a large number of remedies, he was given baryta muriatica pura and he was cured in two months, having used three drachms; the hardness, the flow of mucus or saliva, and the tightness across the chest had all disappeared." (In this case pilocarpine was indicated.)

"Symptoms recorded by provers show general constitutional and

gastric disturbances which point to muriate of barium, a remedy which, in the earlier stages of pancreatic affection, might prove useful. There is a swelling of the salivary glands; profuse salivation; bad taste in the mouth, even the food tasting badly; coated tongue; loss of appetite; nausea; incessant, tormenting, ineffectual retching; inclination to vomiting; violent vomiting of slimy, watery fluid; vomiting of small portions of a nauseous looking and tasting substance for six hours; troubles with the stomach; pressure in the stomach; continual pain in the abdomen; diarrhœa; profuse diarrhœa, without pain in the bowels; liquid stool; stool coated with mucus."

Iodine is highly praised by Rademacher, Reid, and Richard Hughes. Rademacher gave a tablespoonful of a solution of thirty drops of iodine in eight ounces of water, repeating the dose every hour, and saw a rapid curative action from the drug.

Reid used a solution of six drops in six ounces of water, and gave a tablespoonful (he does not say how often, presumably every few hours). He relates the following case cured in two weeks by this medicine: "An inn-keeper, aged forty years, complained of constant pressure on the stomach, with frequent empty eructations, at times vomiting of small amounts of tenacious, rancid mucus, without a real pyrosis, some constipation, and copious flow of saliva. He had to sit constantly. The parotid gland was healthy, the tongue moist, without coating, and he had much thirst. The smallest amount of food would satisfy his hunger, causing no gastric pain. Urine scanty, rather brown. Countenance somewhat pale. Mental depression and irritability. He attributes his condition to a cold taken some six months ago. There is sensitiveness to pressure in the epigastric region toward the navel, and at a spot on the spine corresponding to this. By putting the patient on his back, with his legs drawn close up, securing the greatest possible relaxation of the abdominal muscles, I could discover a rather oblong, transversely-lying swelling. Considerable abdominal pulsation; neither stomach, liver, nor spleen at all sensitive; a chronic inflammation of the pancreas was clearly diagnosticated."

Hughes reports the following case cured by iodine: "A gentleman had an illness that commenced in the middle of the previous August, with black stool and pain in the abdomen. The latter con-

tinued to distress him, shifting from front to back, and also to the right side; he could not lie on the right side, but could always do so on the left. He rapidly lost flesh and strength, and toward the end of September came to England. The patient was sixty years of age, tall, of grayish complexion, and emaciated to a degree. He complained of a severe pain coming on one or two hours after each meal, and lasting during the remainder of digestion. There was no vomiting, but frequent nausea, accompanied by a free flow of saliva. Pulse was slow, large, and empty.

Examination of the abdomen showed tenderness over the pancreas, and on deep palpation, the gland could be felt enlarged and indurated. A diagnosis of pancreatic disease was accordingly made; this would account for the pain and wasting. It was thought that disease was probably malignant, though it was stated that it might be a simple chronic inflammation. Iodine 3x, three drops night and morning was prescribed; to relieve the pain two or three drop doses of atropinum sulphuricum of the same potency were interposed. These remedies were taken regularly until December 20th, when the patient was so much improved that Dr. Hughes allowed him to return to India. The patient's stools had been carefully examined by a microscopist, who found fat globules and shreds of membrane in them." Dr. Hughes uses sulphate of atropine as a palliative for the pain. In my case I found codeine 1x to give the promptest relief.

Belladonna and atropine are recommended by the late Dr. Baehr in "Catarrh of the Pancreatic Duct." If Baehr had not been such a wonderful diagnostician, his diagnosis might be doubted. He reports a severe case which certainly was some form of pancreatitis, cured by sulphate of atropine 3x.

Farrington recommends phosphorus when there is fatty degeneration of the pancreas, but we have no clinical testimony in its favor.

The best summing up of our present knowledge of diseases of the pancreas is made by Dr. Shrady in the "Medical Record" (editorial) March, 1890, as follows: "Considerable interest has been excited in the subject of diseases and injuries of the pancreas by the contributions of Senn and Fitz in this country, and by those of Lancereaux, Minkowski, and Von Mering and others in Europe. The pancreas is an organ which is rarely subject to organic disease,

or to injury; nevertheless, it is not entirely free from ills, and it is likely that minor and functional disorders are not so very rare. In a recent review of this subject by M. F. de Grandmaison ("Gazette des Hopitaux," January 4, 1890), the following diseases are said to affect the pancreas: Acute and chronic pancreatitis, abscess, lithiasis, apoplexies, and tumors, including cysts. To this may be added lipomatosis, degenerative atrophies, disorders secondary to compression, and functional affections.

"Of these somewhat numerous affections, it is only chronic pancreatitis, lithiasis, tumors, and perhaps functional or secondary disorders from compression that can be at present recognized. All the acute disorders, except, perhaps, abscess, are practically unrecognizable. The cardinal symptoms of pancreatic disease are stearrhœa, glycosuria, phenomena of compression, and rapid emaciation. The stearrhœa was first noted as a symptom of impaired function of the pancreas by Cl. Bernard, who produced it by experiments on animals. It has also been noted clinically by Kuntzman, Bright, Unckel, Ancelet, and others.

"Sometimes there is associated with it fatty vomiting. The fatty stools persist even when fat has been withdrawn from the food. However, stearrhœa may be absent in severe pancreatic disease, and it is not by any means a pathognomonic sign.

"Glycosuria has been produced experimentally in animals by destruction or injury of the pancreas, and according to Lancereaux and his pupil, Lapierre, it may be an evidence of pancreatic disease. M. Lancereaux, indeed, asserts that there are three forms of diabetes, viz.: (1) The nervous, (2) that occurring in the obese, and (3) the emaciative form, the latter being due to chronic pancreatitis or pancreatic lithiasis. The nervous form of diabetes results from emotional shocks, traumatism, combined with lithæmic states, and it is usually temporary. It is, in fact, a glycosuria of symptomatic character only. The diabetes of the obese is the more common form; it comes on slowly and progresses slowly. The diabetes with emaciation comes on suddenly; the patient rapidly loses weight; the amount of sugar in the urine is large (fifty to eighty-five grammes daily), and the duration of the disease is not long, the patient dying usually of tuberculosis. The skin is rough and dry, but the boils and carbuncles which occur in the diabetes of the fat are not observed

here. The symptoms of pancreatic disease due to compression are chiefly those resulting from compression of the bile-duct. The gall-bladder is distended, the liver remaining of normal size, and icterus gradually develops. The general symptoms in organic pancreatic disease are those of cachexia and great emaciation. Often there is epigastric pain and intestinal dyspepsia with much flatulence and loose stools.

"As for the special significance of the above symptoms we are still much in the dark. Stearrhœa, we are told, is rare in pancreatic lithiasis, but more common in primary cancer of the head of the pancreas.

"Diabetes with rapid emaciation, if indicative of any pancreatic disease, points rather to lithiasis and secondary pancreatic inflammation to degeneration."

DISEASES OF THE SPLEEN.

CONGESTION.

Causation.—"Congestion of the spleen is of common occurrence under a large number of circumstances. It habitually takes place during the progress of digestion. Pathologically it is mainly observed: (1) In dependence on lesions involving mechanical impediment to the escape of blood from the spleen, such as obstructive cardiac and pulmonary affections, and especially those diseases of the liver, such as cirrosis, in which the portal vessels are implicated; and (2) in connection with numerous acute febrile disorders, of which typhus and enteric fever, pyæmia, and malarious affections may be taken as the types.

Morbid Anatomy.—"In congestion the blood accumulates in the small vessels and intervascular blood-passages, and the organ becomes proportionately enlarged. The rapidity with which this enlargement takes place and subsides is remarkable. The congested organ may attain five or six times its original bulk, while retaining its normal form; and usually becomes, in proportion to the amount of blood which it contains, pulpy, lacerable, and even diffluent. When the congestion is frequently repeated, as in ague, or long-continued, as in portal obstruction, the enlargement tends not only to increase, but to become permanent."

Symptoms and Progress. — "Simple congestion of the spleen rarely, if ever, reveals itself by symptoms, and equally rarely calls for special medical treatment. It can, however, often be recognized, during life (if sought for in those cases in which it is liable to occur), by the presence of a manifest tumor in the splenic region. The normal spleen is situated upon the cardiac extremity of the stomach, its convex surface being in contact with the diaphragm, and no part descending below the ribs. Its lowest point is then in close proximity with the anterior extremity of the eleventh rib, from which point upwards a limited area of dulness, due to its presence, may sometimes be detected on the left side of the thorax. The enlarged organ, however, while partly rising into the chest and increasing the area of splenic dulness in that situation, mainly spreads farther and farther into the abdominal cavity, taking a course downward, forward, and inward. In cases of extreme enlargement it may occupy nearly the whole of the left half of the abdomen, extending from the ribs above to the groin below, from the lumbar region behind to beyond the umbilicus, and causing distinct protrusion of the abdominal parietes. A splenic tumor is usually readily movable, sinking and rising with the respiratory movements, and capable of obvious displacement under manual pressure; its sharp anterior edge can generally be readily felt, and found to present the characteristic splenic notch. If symptoms be present they are mainly a sense of weight or tension in the side and tenderness on pressure."

"Occasionally rupture of the greatly congested spleen takes place; in which case death occurs with some rapidity, either from the escape of blood into the peritoneal cavity, or from peritonitis." (Bristowe.)

Treatment of Hyperæmia.— Acute congestion is best treated by aconite 1x, veratrum viride 1x, or tincture and phosphate of iron 6x. The special indications need not be given, as they are well known. If it is attended by intense pain of a throbbing, aching character, phenacetin, five to ten grains of the 6x, repeated every half-hour, will soon give relief. Acetanelid in similar doses may be equally effectual.

Arnica, internally, is the specific if the cause has been traumatic, as from a blow or bruise. In such cases it should be applied externally. It is also useful if the congestion occurs during fevers or from abuse of quinine. Bellis has been used by Dr. Burnett in such

cases. Bryonia will be useful if the patient suffers from severe stitching pains, which are aggravated by the slightest motion. Cinchona and quinine, which are so prone to cause hyperæmia, ought to be specific in some cases. In some cases of anæmia, sudden attacks of hyperæmia of the spleen may occur and lead to hemorrhage. In such cases ergot given in doses of ten to twenty drops every two hours will arrest it, but it should be followed by phosphate of iron 6x, ten grains after each meal. If due to sudden arrest of the menstrual flow, sabina, sanguinaria, and senecin are the appropriate remedies. If it attends stasis in the portal system, mercurius dulcis, two grains every two hours until ten grains are given; this should be followed by laxative doses of Carlsbad salts, Epsom salts, or Rubinat water. This medication will soon remove the hyperæmia.

If the congestion occur during repeated paroxysms of ague, quinine, arsenic, cedron, or muriate of sodium should be given, and the paroxysms arrested as soon as possible. If the congestion remains, arnica, or ceanothus will remove it.

Ceanothus is doubtless a specific spleen remedy. How it gained such a reputation is as much a mystery as the original discovery of the anti-malarial virtues of cinchona bark. Ceanothus, under the name of "Jersey tea," was extensively used as a beverage and substitute for tea during the Revolution, and is still so used by the poor who live on the Atlantic coast from New York to North Carolina. This region is intensely malarious. Probably it was observed that those who largely used this beverage got rid of splenic pain and enlargement. I can imagine no other way of its discovery as a splenic remedy. It is said that the discovery of the value of Peruvian bark was accidentally made by the Peruvians, who drank the water of streams impregnated to bitterness by the leaves and branches of the cinchona.

Dr. Burnett, in his admirable little monograph on "Diseases of the Spleen," has proved the specific value of ceanothus in many disorders of that organ. I first found a notice of its usefulness in an old work on "Botanic Practice," published in 1820, and reproduced it in the first edition of "New Remedies." Dr. Dunham verified its value. The dose varies from the 6x to thirty or sixty drops of the tincture.

INFLAMMATION.

Causation. — "Inflammation of the spleen, at least in acute form, is exceedingly rare, excepting in cases due to injury, embolism pyæmia, or the presence of morbid growths or foreign bodies.

Morbid Anatomy.—"Splenic embolism is most frequently a consequence of valvular disease of the heart. It leads to the formation of wedge-shaped blocks, or masses, which, varying in size from a cubic inch or two downwards, are multiple, and usually near the surface of the organ. In the first instance they are mainly hemorrhagic, and distinguishable from the splenic tissue by their darker color and greater solidity; but soon the coloring matter gets absorbed, and the masses pass through various stages of reddish brown, yellowish brown, and buff color, until they become almost pure white. Sometimes they soften into a puriform pulp, sometimes undergo suppuration, and sometimes (especially if small) get absorbed, leaving depressed cicatrices behind in which earthy particles may remain imbedded. The presence of these infarctions generally gives rise to inflammation in the peritoneal surface over them. Pyæmic formations present much the same characters; but they are usually more numerous and smaller, and their tendency to soften, suppurate, and involve the peritoneum covering them, is much more marked. Splenic abscesses may result from the above and various other causes, and, like other abdominal abscesses, may acquire large dimensions, and are liable to various terminations. They may open externally through the abdominal walls, or rupture into the peritoneum, or discharge their contents into the colon, left lung, or pleura. Adhesive inflammation is not uncommon at the surface of the spleen, and occasionally circumscribed suppuration occurs between this organ and some neighboring part, such as the stomach, diaphragm, colon, or abdominal walls.

Symptoms.—"In most of the affections now under consideration there is little or nothing special excepting locality to direct attention during life to the spleen as the seat of the disease. There may be, and indeed probably always is, manifest increase of size of the organ, together with uneasiness, pain, and tenderness. The pain, when severe, is mainly due to circumscribed peritonitis, and, from the position and relations of the organ is liable to augmentation during the respiratory movements. The recognition of an abcess will depend

on its attainment of such a size as to form an appreciable fluctuating tumor in the splenic region, and on the phenomena that attend and follow the process of pointing and the discharge of its contents. In all these cases, sympathetic vomiting and febrile symptoms will almost certainly manifest themselves, and rigors are not unlikely to supervene. But it is rare for the splenic affection to be so free from complication as to justify us in attributing them to it.

"Special treatment will only be called for when pain is complained of or when an abscess becomes manifest. In the former case, poultices and fomentations are the most useful applications; in the latter the case must be treated as one of hepatic or other internal abscess." (Bristowe.)

Acute Splenitis is not a common disease in temperate climates. In this respect it resembles acute suppurative hepatitis. The most common cause, according to Virchow and Billroth, is "hemorrhagic infarctions occurring during infectious diseases." They may occur during endocarditis, pyæmia, or when the blood is seriously altered by poisonous secretions. The emboli plugging the splenic blood-vessels develop septic properties. The indications are: (1) To improve the condition of the blood; (2) to remedy the consequences of the infarction.

Aconite and veratrum viride are of value so far as they are capable of reducing the force of the circulation. Arnica, bellis, eucalyptus, arsenic, and carbo. vegetabilis are indicated for the swelling and plugging in inflammation from the rupture of blood-vessels.

Bryonia is recommended by Dr. R. Hughes when the capsule of the spleen is inflamed. Ranunculus is recommended by Bœninghausen and Dunham. My experience has been limited in this disease, but it is my conviction that the best remedies for chronic splenitis will prove to be cinchona and eucalyptus, given in small but appreciable doses. If the symptoms point to a profound deterioration of the blood, the above remedies should be aided by arsenic or the arsenite of iron.

When the spleen becomes enormously enlarged, uvedalia internally, in doses of ten to thirty drops four times a day, should be given, and a thirty per cent ointment of the same drug rubbed in, morning and night. I treated two cases with this medicine and was pleased with the improvement which followed its use.

Iodine and iodide of potassium are recommended by the old school, but there is no positive proof of their value.

Ergot, given by deep injections into the substance of the spleen, is recommended by Hammond, but the results are not uniformly good. Mosler used a two per cent solution of carbolic acid and Fowler's solution of arsenic (one part to ten of distilled water), especially in leucemic spleen, but some of his cases resulted disastrously.

Carduus, chelidonium, and muriate of sodium have in Dr. Burnett's hands proved useful when it was coincident with enlargement of the liver and stasis in the portal system. In suppurative splenitis, if diagnosed in time, we may prevent extensive suppuration by the use of silica, hepar sulphur, or hypophosphite of lime.

SPLENALGIA.

This malady is described by Wardell in Reynold's "System of Medicine." It is defined as consisting of attacks of pain in the region of the spleen induced by violent exercise, such as running, riding on horseback, rapid walking, and climbing hills or stairways. It is doubtful if the pain is in the spleen. It is most probably a myalgia, as described by Anstie.

Symptoms. — When attacked, the individual halts, places his hand on the left hypochondrium, and bends over to that side. Hard pressure in the region of the spleen seems to relieve the pain. It is greatly aggravated by the deep inspirations which are made under the circumstances. The inspirations are cut short by a "stitch" or "catch" which causes such pain that the sufferer cries out. It is somewhat like the pain in pleurisy. The intensity of the pain is soon over, but in rare cases it has been known to last for hours. A sore sensation may be felt for several days after prolonged attacks. There is a popular belief, or superstition, that if the spleen is removed the individual is rendered insensible to fatigue under the most violent exercise.

I do not think this affection should be called a splenalgia any more than myalgia of the intercostal muscles should be called a pleurodynia. The attachments of the muscles, especially their upper attachments, are the seat of the pain. When a youth I was a great sufferer from

these attacks. They have continued whenever I have indulged in unwonted exercise. I could not play base-ball, run races, or ride a trotting horse, without being liable to such severe attacks as to oblige me to lie down if running, or to get off my horse if riding. No exertion of will power ever enabled me to endure the pain and keep in motion. In my case the pain generally commenced on the left side at the border of the last true rib, and if I did not immediately bend to that side, and press hard upon it, or lie down on my left side with my body bent, it would spread all over the left flank and across the abdomen. What convinced me that the pain was not splenic was that occasionally the pain commenced on the right side, and extended to the left flank. This right-sided pain has been erroneously described as hepatalgia. When a student of medicine I tried all the apparently indicated drugs, in view of effecting a cure, but without avail. I believe it depends on the same causes as any other myalgia, namely, a loss of tone in the muscular system. Anæmia or a constitutional delicacy is the etiology.

Treatment. — No drug acts quickly enough to relieve the suffering unless it is amyl nitrite or chloroform. I have never tried them, but should not hesitate to do so. To cure the tendency, I would advise the use of iron and hypophosphate of sodium or potassium, in cases of anæmia. If the patient is neurotic, ignatia, strychnine, arnica, and cimicifuga. Hydrastin 1x trituration continued three times a day for weeks ought to effect a cure.

HYPERTROPHY OF THE SPLEEN.

Causation.—"True hypertrophy is for the most part the consequence of long continued or repeated congestion. It is therefore frequently associated with cirrosis and other chronic affections of the liver, and is a common consequence of repeated attacks of malarial fever. It is, moreover, a usual complication of rickets. But some of the most remarkable examples of this affection are furnished by persons who have never suffered from any of the above disorders, and in whom there is no history pointing to the operation of any specific cause."

Morbid Anatomy.—"In true hypertrophy, the organ enlarges without undergoing any obvious change in texture; there is a gen-

eral increase of all its elements in pretty nearly equal proportion; and it requires a more or less firm fleshy consistence. It is in this condition, and in that associated with leucocythæmia, that the spleen attains its greatest volume, sometimes filling the left side of the abdomen from the ribs above to the pelvis below, and from the lumbar region behind to some inch or two, or more, beyond the umbilicus. It may then measure as much as sixteen inches in length, ten in breadth, and five or six in thickness, and weigh ten, twelve, or even twenty pounds. It retains its normal shape.

Symptoms and Progress.—"The symptoms due to simple hypertrophy are vague and difficult to disentangle from those of other lesions with which they are frequently associated. Persons thus affected often suffer from anæmia, discharges of blood (especially from the gastro-intestinal mucous membrane), and abdominal dropsy; but it is uncertain how far these phenomena depend on the hepatic lesion which so commonly goes along with splenic enlargement, how far on the splenic disease. But, putting such symptoms aside, there is nothing left to indicate the presence of splenic hypertrophy beyond the local phenomena to which it gives rise. The chief of these is the manifest existence of a tumor which presents the characters (before described) of enlarged spleen, tough and unyielding in consistence, giving to the patient a sense of weight and fulness, especially if he lies upon his right side, and unattended with pain or tenderness on pressure. A venous hum, of musical character, may occasionally be recognized on the application of the stethoscope over the tumor. The duration of these cases is always uncertain, and often much prolonged. In some instances amelioration or cure takes place under suitable treatment; in some the organ remains stationary, and yet with little manifest deterioration of the patient's health; in many death ensues sooner or later, either from simple anæmia and debility, or from these conditions associated with hemorrhage, dropsy, or some intercurrent affection." (Bristowe.)

The *treatment* of hypertrophy must depend largely on the constitutional malady which has given rise to it. If it be a sequel of ague, arnica or arsenic is indicated; if the patient be suffering from rickets, the remedies suitable for that condition must be employed; if there be heart, pulmonary, or renal disease, our efforts must be regulated accordingly. In many cases no such clue is furnished; and we must

then have recourse to those remedies which the general condition of the patient seems to suggest; among the more important may be enumerated iodine, iodide, and bromide of potassium, iron, cinchona, ceanothus, etc. The bowels should be kept freely open by the use of mild laxatives, if necessary.

Dr. Burnett, in his "Diseases of the Spleen," gives some very interesting cures of enlarged spleen made by means of chelidonium, carduus, etc., when the liver was also enlarged. I have written of the value of ceanothus in another place.

Ichthiol internally, two to four grains daily, and externally in the form of an ointment, ten to twenty per cent, is highly recommended in Germany for hypertrophy of the spleen. It acts better than iodine, and is quite safe.

Grindelia squarrosa has lately been used successfully in hypertrophy of the spleen in consequence of malarial fevers. In the "Pharmacology of the Newer Remedies," pages 755 to 761, are given twelve cases of this disease cured by this drug. Thirteen physicians report favorable results from its use. The chief symptoms were great enlargement of the spleen, with much tenderness on pressure, paroxysms of ague that had resisted quinine, ascites, anæmia, and leucocythemia. The doses were from ten to thirty drops every three or six hours. The drug soon arrested the chills, the swelling and tenderness of the spleen gradually disappearing.

It is asserted that its action on the liver is similar to leptandra. Dark-colored stools follow its use, with improvement in the symptoms of hepatic torpor and portal congestion.

CHAPTER VII.

DISEASES OF THE URINARY SYSTEM.

DISEASES OF THE KIDNEYS.

NEPHRALGIA.

DEFINITION. — In its strictest sense this term would mean pain in the kidneys; in its broadest sense, pain in the region of the kidneys but having some connection with those organs. "There is a popular impression," says Keyes, "that all kidney diseases are attended by pain in the back, the severity of the disease regulating the amount of pain. This impression is incorrect. Some kidney diseases are attended by pains in the back, others are not." Pain over the region of the kidney is a symptom by no means confined to diseases of that organ. It is found in many morbid bladder and prostatic conditions; is an accompaniment of hemorrhoids, uterine diseases, and very often is a simple lumbago, not depending on any internal disorder. In bladder and prostatic diseases the pain in the back is more likely to occupy the sacral region, particularly the sacral-iliac synchondrosis of one or both sides. The same pain occurs from piles. Uterine pains may locate in any portion of the spine—reflexly, but if in the uterus itself, is in the lowest sacral region. In lumbago the pain is aggravated by motion of the trunk, or in rising from a sitting posture; is usually worse in damp weather, or on the approach of a storm.

In true nephralgia the pain is in the kidneys. It is deep-seated, felt in the back over the kidneys, usually unilateral, often extending down around the side, following the course of the ureter, sometimes continuing into the testicle, and complicated by bladder symptoms suggestive of stone or chronic cystitis of the neck. The pain varies in intensity, and is usually made worse by fatigue. Pressure generally aggravates, but sometimes relieves. Often the patient cannot

lie in bed on the affected side. The pain is usually a dull, deep ache, occasionally sharp, darting, pricking, or lancinating in character. It may appear suddenly or gradually, and remain for hours or years, according to the cause. Nephralgia does not mean a pure neuralgia of the kidneys, which is a very rare affection. The latter, however, may and does sometimes occur in a person who suffers from neuralgic attacks in other parts of the body. One form of neuralgia of the kidneys is very often caused by irregular use of the sexual organs, or excitement without gratification. Nephralgia may be caused by kidney-stone, or organic kidney diseases (cancer, tumor, displaced or floating kidney, or pyelitis). Excessive acidity of the urine is a frequent cause; or retention of the urine. We should not venture on a diagnosis of nephralgia until we have eliminated all the above organic diseases, as well as lumbago, uterine, prostatic, or hemorrhoidal diseases. We should then examine the urine. If we find the urine excessively acid, we may safely say the nephralgia is due to that condition. Oxaluria is often a cause of a dull, heavy, wearing nephralgia. I have found this condition usually associated with some form of hepatic disorder. If the urine is found healthy, neutral, and if it becomes profuse and watery after the subsidence of the pain, we may safely diagnose the case as neuralgia, especially if the pains are sharp and paroxysmal.

Treatment. — Nephralgia from acid urine requires bryonia, colchicum, cimicifuga, salicylate of sodium, and salol, aided by the free use of such alkaline waters as Vichy, Carlsbad, and similar springs in this country. The citrates of lithium and potassium, and the benzoates of lithium and ammonia, are useful when indicated.

In neuralgia, purely functional, aconite, belladonna, atropine (3x), berberis, cannabis indica, coccus cacti, phosphorus, turpentine, valerianate of zinc, and phenacetin are the most useful.

If the neuralgia arises from ungratified sexual erethism, which cannot be subdued by mental diversion or physical exercise, the bromides, or salix niger, should be given in sufficient doses to keep the erethism in abeyance.

CONGESTION OF THE KIDNEYS.

Active congestion of these organs is not usually a condition which is of long continuance. It is supposed to be present in all fevers.

Osler says "the kidney of fever is commonly swollen, the blood-vessels are congested, and the cortex frequently shows traces of cloudy swelling." Acute congestion is always present in the early stages of nephritis, whether due to cold, influenza, or severe renal irritants. Excessive doses of turpentine, copaiva, cantharides and all that class of drugs invariably cause hyperæmia of the kidneys. Acute congestion is usually attended by a heavy, dull pain in the lumbar region; scanty, high-colored urine, and slight fever. Chronic congestion is usually a mechanical hyperæmia caused by chronic disease of the heart or lungs, and the treatment should be directed to those organs mainly. All renal irritants primarily cause acute, and secondarily chronic congestion. They must be selected according to their symptoms, and the dose 3x to 6x in acute, and mother tincture to 3x in chronic cases. Medicines are not all that are needed in renal congestion. The diet and clothing of the patient are equally important. In acute congestion no red meat, beer, or alcohol in any form should be allowed. No rich soups, eggs, or oysters. The drink should be mainly pure water — that water which contains the least mineral or inorganic matter. Milk or buttermilk are next in value to water. The inner clothing should be wool, sufficient to keep the skin warm and moist.

HÆMATURIA.

Definition.—A discharge of blood from the urinary passages.

Causes.— It may occur during the progress of any malignant or infectious fever, and in scurvy, purpura, hæmophilia, and leukemia.

Renal causes are congestion and inflammation; Bright's disease; infarcation of the kidneys; stone in the kidneys, cancer, tubercles, and tumors; parasites in the kidneys; the *filaria sanguinis hominis*, and the *bilharzia;* drugs, such as turpentine, carbolic acid, cantharis, and other renal irritants. It is important to study these drugs and the way they act, for they are our chief remedies in hæmaturia.

A stone in the ureter or bladder may cause considerable bleeding.

Diseases of the bladder, such as cancer, varicoses with rupture, ulceration, villous tumors, and foreign substances in that viscus. Blood may come from the walls of the urethra during an attack of urethritis.

Injuries may produce bleeding from the urinary passages. A fall

or blow on the back may rupture the kidney and cause very free bleeding. Injury to the bladder or prostate may cause it. The use of the catheter is often followed by hemorrhage.

There are cases of hæmaturia which may exist for a long time without a discovery of its cause, particularly in young persons. Dr. Gull quaintly designated these cases as "renal epistaxis." Vicarious menstruation may assume this form; two cases have occurred in my practice in blooming young girls. They suffered no pain in the urinary organs, but had for a day or two the discomforts which attend menstruation. A variety of hæmaturia has been termed malarial, occurring from malarial poisoning.

Diagnosis.— It may be easy to recognize blood in the urine, but more difficult to tell where it comes from. The urine, when it contains blood, has a peculiar "smoky" appearance, the color varying from a light to a deep red, or it may have a dark porter color. A saturated uric acid urine may sometimes be mistaken for bloody urine. I have seen many cases when the only sign of hæmaturia was a soot-like sediment — black or very dark brown. Under the microscope this sediment was composed of broken-down blood globules; the black appearance is caused by its long retention in the bladder. Keyes thus defines the diagnostic points: "If the bleeding is from the fore part of the urethra some of it will reach the meatus between the acts of micturation; if behind a narrow stricture, or posterior to the membraneous urethra, it will not. Blood effused into the urethra clots there, and assumes the shape of a leech, or a tape or thread. Such clots are apt to come out with the first gush of urine, although, if there be a tight stricture, they may not be able to squeeze through until the stream is running at full force, and consequently would not appear until the middle or near the end of the flow. Blood from the seminal vesicles will be clotted and mingled with the yellow bodies found there, and with spermatozoa. Blood from the prostatic sinus is pretty sure to be clotted, perhaps in strings and threads mingled among flakes and pus-corpuscles. When blood comes from this region, the spermatic fluid in sexual intercourse is very apt to be bloody. Blood from the neck of the bladder may or may not be clotted. Often a few irregular clots will come first; then smoky urine will flow, and finally, as the bladder expels its last drops, the prostrate and vesical neck being squeezed, a little

highly-colored urine, or fluid resembling pure blood, will be voided.

"Blood flowing from any part of the bladder, and sometimes from the prostatic sinus as well, if it flows rapidly into an empty bladder, is pretty sure to clot in mass, and to dissolve afterward. If, however, it flows very slowly, or into a bladder partly filled with urine, it may not clot at all, but remain freely suspended in the urine, retaining its natural red color; or, after a few hours, become brown or black by the deoxidizing effect of the urine, the red oxyhæmoglobin, becoming converted into brown methæmoglobin. Blood may clot in the pelvis of the kidneys, but coming down from the kidneys does so usually in a fluid state, either as red or black blood; fibrinous clots may, however, pass the ureters with symptoms of kidney colic. Blood from the kidneys has no special physical character by which it can be distinguished from blood coming from the bladder, except in those cases where blood-casts of the uriniferous tubules are found. These are pathognomonic. The quantity of blood flowing from a cancerous kidney varies very greatly, sometimes disappearing for weeks, and then recurring violently. Rayer says that, from a comparative examination extending over a length of time, of all urine passed by patients with calculous pyelitis or cancer on the kidney, he noticed several times (*plusieurs fois*) that the urine voided three hours after eating was more than ordinarily loaded with blood. When the blood comes from the kidneys, there is often pain or heaviness of the lumbar region of one or both sides. Blood may flow from the ureter if a calculus be retained there. Rayer has noted several cases, in two of which there were also exuberant granulations in the ureters, which bled.

"The origin of the blood in the urine may in some cases be cleared up by a clever expedient resorted to by Thompson for the differential diagnosis of pus from the bladder or kidneys in obscure cases. A soft catheter is gently introduced just within the bladder neck, the urine drawn off, and the cavity washed out very gently with tepid water. If the water cannot be made to flow away clean, the inference is that the blood comes from the cavity of the bladder. If it will flow away clean, then the catheter is corked for a few moments, the patient being at rest, and the first drachm of urine which collects may be drawn off and examined. The bladder is now again washed out, and if after a single washing the second flow of

injection be clear, while the drachm of urine is bloody, the inference is again complete that the blood comes from one or the other kidney. Bloody urine is always albuminous."

Treatment.—Absolute rest on the back is very necessary. The desire for frequent urination should be controlled if possible by the will. But little fluid should be drank. Dr. Keyes recommends the Rockbridge alum mineral water. I have found very useful, pure water slightly acidulated with sulphuric acid.

Any drug which sufficiently irritates the kidneys to cause bleeding from those organs will probably cause bleeding from any portion of the urinary tract. We do not yet know of any drug which has a special affinity for any one portion of that tract.

Hamamelis is of real value in many cases. Theoretically it is indicated when the cause is varicosis with rupture of the veins, but we have no means of knowing whether blood comes from the veins or the arteries, because the urine changes the color of the blood. If the patient has piles or portal congestion, and general varicosis, we may suspect venous hemorrhage. Carduus, collinsonia, æsculus, aloe, and sulphur may be indicated along with hamamelis. If there is a good deal of irritation of the urinary passages, and the blood is bright red and passed frequently, turpentine, erigeron, erechthites, oil of sandal-wood, cantharides, cannabis, millefoil, cubebs, and copaiva. In such cases the remedy should be given in minute doses, not lower than the 2x. If, on the contrary, the blood is scanty, forming a sooty sediment, and the hemorrhage appears to be passive, they may be given in the 1x dilution or even a few drops of the tincture. Other remedies for passive hæmaturia are ergot, trillium, gallic acid, rhus aromatica, phosphorus, lycopus, digitalis, thapsi bursa pastoris, hydrastis, chimaphila, uva ursi, mitchella, epigæa, corn silk, ustilago, pulsatilla (especially in vicarious hæmaturia), pichi, galium, arsenic, creosote, carbolic acid, senecio, and many others.

Each medicine must be selected according to the totality of the symptoms, of which the chief must be hæmaturia. I doubt the universal value of arnica when traumatism is the cause. Turpentine or any other renal irritant is just as likely to be the remedy.

When the bladder has become filled with a solid clot, Keyes says: "Let it alone; no harm can come of it. It will dissolve and come

away; any attempt to pump it out through a catheter or break it up or dissolve it, if successful, will only allow the blood to re-collect, and is fraught with danger (to the patient) of exciting inflammation by violence. The best treatment is opium to control desire to urinate, rest, and diluents."

Pepsin (papoid would be better) has been injected, with the result that a digested blood has escaped readily through the catheter. Peroxide of hydrogen is said to dissolve blood-clots readily.

Phosphate of iron, 3x to 6x, has been recommended when the bleeding was active and from the kidneys, with much arterial excitement. I have never tried it. In a few cases of hæmaturia during anæmia, the tincture of the muriate of iron has seemed to be of benefit. Dr. Gross ("Practice") praises it highly in doses of twenty drops three times a day.

Piperazin, in doses of five to ten grains three times a day, has cured many obstinate cases of renal hæmaturia. The lower triturations might be equally effectual.

HÆMOGLOBINURIA.

Definition.—A condition characterized by the presence of blood pigment in the urine. "The blood cells," says Osler, "are either absent or in insignificant numbers. The coloring matter is not hæmatin, nor in reality always hæmaglobulin, but it is most frequently methæmoglobin." The urine has a red or brownish red, sometimes quite black, and usually deposits a heavy brownish sediment. When the hæmaglobin occurs only in small quantities it may give a lake or smoky color to the urine. The urine is generally albuminous. It may be red, when the number of blood cells are small. Two kinds of hæmaglobinuria are recognized — the toxic and the paroxysmal.

The toxic is usually caused by the poison of scarlet fever, yellow fever, typhoid fever, and syphilis. It has followed severe burns. It may occur after very violent exertion. It sometimes occurs in horses, coming on with great suddenness and associated with paresis of the hind legs, death occurring in a few hours or days. It has been caused in men by the administration of chlorate of potassium, pyrogallic acid, arseniuretted hydrogen, carbon dioxide, naphthol, and muscarin.

Paroxysmal hæmaglobinuria is a rare and mysterious disease. It

occurs in occasional attacks of passage of bloody urine in which the coloring only is present. It appears to be caused by cold and exertion, and has been brought on by the cold foot-bath. It is believed to be associated with Raynaud's disease. It sometimes attends malaria and jaundice.

Osler says the essential pathology of the disease is unknown. He seems to imply that it is a vaso-motor neurosis.

Treatment.— The old-school treatment of this disease is unsatisfactory. "Nothing seems to check the occurrence of the attacks." If chlorate of potassium and the other drugs above mentioned cause this disease, it would seem that they ought — according to the law of *similia* — to cure it.

It is a fact, however, that a disorder of the human body, or its fluids, produced chemically, is not cured by the drugs capable of producing it. At least, this has been my experience. I would not be understood as denying their ability to cure. Our literature is absolutely sterile of any reports of cures of hæmaglobinuria, and I have never treated a case.

NEPHROLITHIASIS — (Renal Calculus).

Definition.— The deposit in the pelvis of the kidney, or in the substance of the kidney, of concretions formed from the solid constituents of the urine.

Etiology.— In the kidney substance itself, a separation of the urinary salts may occur. These deposits do not need further mention, as they do not cause appreciable symptoms.

In the pelvis and calyces of the kidneys concretions occur of various sizes and appearances.

(1) Renal sand; small gritty particles like brick-dust. They may be voided in the urine for long periods without causing any symptoms, except in children, whose ureters and urethræ are so small as to be irritated by the sand.

(2) Larger concretions from the size of a squirrel-shot to a bean; they may be either single or multiple, round or smooth, irregular or covered with sharp projections. It is the smaller of these which produce renal colic.

(3) There are other forms, like the "coral" or "dentritic" cal-

culi, which may block up the orifice of the ureter, or fill the pelvis of the kidney like a mould.

Chemistry.— (1) Uric acid calculi are the most common and the most important. They form the renal sand, the small, solitary, multiple, and dentritic. They are hard, red, and generally smooth; stratified and very dense. Urates and uric acid may be mixed in the stone.

(2) Oxalate of lime; which form mulberry-shaped stones studded with sharp points and spines. They are very hard, dark in color, and are composed of oxalate of lime and uric acid.

(3) Phosphatic; composed of ammonio-magnesium and phosphate of lime with occasionally the carbonate. They are not often met with.

(4) Cystine, xanthine, carbonate of lime, indigo, and urostealith are rare forms of calculi.

Symptoms.— Renal calculi may produce definite and characteristic symptoms, as pain in the back, which may be only a dull soreness or aching in the lumbar region, or it may be severe and appear in paroxysms. It is generally on one side, that of the affected kidney, but may be confined to the sound kidney. Pain of a similar nature may occur in movable kidney. We should be cautious about our diagnosis from pain alone, for a sound kidney has been cut down upon in the effort to find the stone. Hæmaturia is a prominent symptom. It usually occurs after exercise, riding or walking, or lifting. It is seldom profuse, but may persist a long time if the patient cannot remain at rest. Sometimes the only sign of bleeding is a smoky-hue of the urine, as after scarlatina. Pyelitis and pyeuria often occur from the constant iritation of the stone.

When the calculi enter the ureter we have a renal colic. The attacks may come on suddenly, without apparent cause, or after lifting, horseback riding, jumping, or a fall. It is an agonizing pain which is nearly always confined to one side, starting in the flank; it then passes down the groin, following the course of the ureter, and is often felt in the testicle, or down the inner side of the thigh. It has been known to radiate to different and remote parts, as the stomach, chest, and dorsal region. In severe attacks there is violent retching and vomiting during the pain, and the patient is cold and almost in collapse, with cold perspiration and feeble pulse. There

is probably no suffering so intense, not even childbirth or angina pectoris.

The attacks may last for an hour, or for several days, with intervals of temporary relief. Intense dysuria is present, with almost constant desire to urinate. The urine is generally scanty and bloody, but I have seen instances when it was very profuse and watery, probably coming from the sound kidney. The urine may be entirely suppressed even when one kidney is sound, but it generally occurs when the other kidney is seriously diseased, or when only one kidney exists. In such cases uræmia, sometimes fatal, occurs.

Diagnosis.— The pain in floating kidney may be mistaken for the pain of stone in the pelvis of the kidney. Renal colic may be mistaken for intestinal colic, or colic from biliary calculi, unless the symptoms are carefully located. Some of the pains of dysmenorrhœa, also crural and inguinal neuralgia, simulate renal colic. But the distinctive features of renal colic are the situation and direction of the pain, the retraction and tenderness of the testicle, and the peculiar appearance of the urine.

The diagnosis between stone in the kidney and stone in the bladder seems easy, but it is sometimes difficult. A stone in the bladder, irritating the neck, may cause pain radiating up one, or both ureters, and the patient may not be able to define the direction of the pain. In stone in the bladder the urine is alkaline, in renal stone it is acid. There is more mucus in stone in the bladder, and more pus in stone in the kidney.

It is stated that we may be able to predict the form of calculi from the symptoms. The large uric acid calculi less frequently produce severe symptoms. Oxalate of lime calculi causes more severe radiating pain than the uric acid. In both these forms the urine is acid. Phosphatic calculi are said to cause the most intense pain. In a case of renal colic extending over several years, and more intense than any other in my experience, the stone when voided proved to be composed of xanthine. It was sharp, jagged, and very irregular.

Treatment.— Sir William Roberts, in a series of lectures on the chemistry and therapeutics of uric acid gravel and gout ("Lancet," June 25, 1892), says the treatment of calculous disorders must be in the main preventive. "The chemical force which is requisite to

prevent the precipitation of uric acid in the urinary channels is almost infinitely small as compared with the force which is requisite to redissolve a concretion already formed. Uric acid gravel is constantly seen existing *per se*, in persons who are in all other respects perfectly healthy. From a therapeutic point it is a mischievous notion that uric acid gravel and gout are substantially the same disease. Gravel should be regarded as a primary vice of the urinary function, and the urine the proper field for its investigation and treatment. The author's experiments point strongly to the suggestion that subjects of gravel should be advised to take as much culinary salt as their palates will tolerate. The most reliable investigations indicate that fat, sugar, and starchy matters have not the slightest influence on the production and excretion of uric acid, nor has any proof been given that albuminoid substances of vegetable origin differ in this respect from albuminoid substances of animal origin. The author believes that the free use of farinaceous articles, salads, fruits, and garden vegetables, all comparatively poor in albuminous constituents, should be advised. All other schemes of treatment sink into insignificance in comparison with that of diminishing the acidity of the urine. It is chemically impossible for uric acid to be deposited from an alkaline urine, and as we have the means of harmlessly reducing the acidity of the urine at will, we have in our hands, in principle at least, the absolute power of preventing uric acid gravel. The risk in gravel is almost confined to precipitations which take place within the precincts of the kidneys, and the author has found that the most risk of precipitation in the kidneys is during the time of sleep. Therefore, a single dose of citrate or bicarbonate of potash or soda (forty-five to sixty grains dissolved in three or four ounces of water), taken at bedtime, suffices for the milder cases. In others, a second dose can be taken in the night when the patient has a call to empty the bladder. The precipitation can thus be postponed until the urine reaches the bladder, whence it is swept away, as a rule, before it has a chance to do harm."

In addition to this excellent advice from such high authority, I advise the free use of pure alkaline, and mildly saline waters which contain a minimum quantity of the lime salts, especially the sulphate. Among the pure waters which contain the smallest amount of mineral matter, the Poland water of Maine is preëminent. Its

value lies in the fact that it comes next to distilled water. In Chicago the "redistilled" water sold by a reputable ice company is the best I know of. If it is not convenient to purchase distilled water, the cost of a simple apparatus for distilling is small. In some cases the alkaline-saline waters are of more value than distilled water. The European and American Vichy waters are valuable. The lithia waters now so extensively advertized with fulsome praise may be of service in some cases, but only when lithia is really indicated by some peculiar symptoms of the patient. None of the natural lithia waters contain more than one grain to the gallon. If more is claimed, it is probably added. Now we are warned by old-school authorities not to give more than three or five grains daily on account of its unpleasant action on the heart. Dr. H. C. Wood ("Therapeutics") says: "In twenty-grain doses I have seen it apparently produce severe general prostration amounting almost to general paralysis." It would be manifestly dangerous to drink an artificial lithia water containing ten or twenty grains to each gallon, as advised by some writers. If lithia waters are of value, it is more as a preventive of gravel, than for dissolving them in the urinary passages. Because lithia dissolves uric acid gravel in the test-tube it does not prove it will do the same in the bladder or kidney. But lithia is usually associated with the alkaline carbonates in natural water, and these keep the urine alkaline if enough is taken. Besides, lithia has a sedative action on the urinary mucous surfaces when taken in small quantities.

The natural lithia waters should be drank hot in the morning and at night, and cool during the day, and at regular intervals, but not during mealtime, except a small tumblerful. If the natural lithia waters are not obtainable, give five or ten grains of the 1x or 3x trituration of the citrate, carbonate, or benzoate of lithia, in a glass of distilled water, between meals and at night.

Piperazin, one of the recent coal tar derivatives, is claimed to be more potent than lithia, potash, or any other solvent of uric acid. It is freely soluble in water, and in cold aqueous solution will dissolve twelve times as much uric acid as will lithium carbonate. Its urate, which is said always to be a neutral salt, is seven times more soluble in water than in the corresponding salt of lithia. It is a stable compound, apparently not undergoing decomposition in the

organism. It is readily excreted by the kidneys, and may be detected in the urine in a few hours after a single dose. It is claimed that piperazin has great curative influence over gout, prevents the formation of uric acid calculi, and even dissolves them in the kidney. In order to test this claim, Dr. D. D. Stewart, of Jefferson Medical College, tried it in a number of cases of uric acid diathesis, with renal calculus. In a typical case with a history of almost continuous ache in the right loin for nearly a year; paroxysms of pain shooting towards the bladder, occasional passage of gravel, anorexia, constipation, bad taste, leucorrhœa, painful menstruation, severe headache twice a week, melancholy, very acid urine, s. g. 1.028, with excess of free acid, microscopic calculi of ammonium urate and uric acid, amorphous urates, red blood corpuscles, epithelium from pelvis of kidney, no palpable tumor in flanks, but a deep-seated tenderness, etc. For two months citrate of potash was given liberally in large quantity of hot water, with no improvement. Then a lithia water was used freely, with no better results; meantime there appeared fullness, dullness, and resistence in each flank, and other symptoms of stone in the kidney became more pronounced.

Nephrotomy was advised but not consented to. Owing to the very scanty urine, often but seventeen ounces daily, diuretin was given, but without effect. Then piperazin was given, fifteen grains daily, with surprising effects. After three or four days the amount of urine increased to four to six pints daily. The loin pain was much diminished, and the fullness and dullness less in area. Her general condition improved, appetite and digestion being better than for years. In a few months more she seemed perfectly recovered. It is a singular fact, observed by Stewart, that piperazin does not render the urine alkaline, while it reduces the uric acid to a minimum, and increases the elimination of urea.

Many similar cures are reported by German authorities, and the drug seems worthy an extended trial. I would suggest the use of the 1x trituration in ten to thirty grain doses, in distilled or pure water, every three hours. There is a solution prepared by a German chemist which it is claimed has superior merits. We know of no other substances which have any power to dissolve uric acid calculi.

I know from considerable experience that boro-citrate of magnesia will distintegrate phosphatic and calcareous stone in the kid-

ney, and I have reported several notable cases. The doses used ranged from five grains of the crude salt to five grains of the 1x trituration. Often the latter appeared to act best, given of course in large quantities of pure water.

A great many drugs have gained a reputation as solvents of stone, or possessing the power of disintegrating and expelling them, but such claims are doubtful. They probably act by lessening irritation, and relaxing the tissues of the urinary passages. Among them are benzoic acid, berberis, epigæa, lycopodium, eupatorium purpureum, galium, stigmata maidis, buchu, pichi, shepherd's-purse (thlaspia), orthosiphon, hydrangea, actinomeris, onosmodium, chimaphila, liatris spicata, eryngium, etc. Under the use of all these, uric acid and other calculi of various sizes may have been expelled. When successful, they were usually taken in infusion, cold or hot, and the quantity of watery menstrum has been large, which may partially account for the favorable results. In some cases, however, I have known uric acid sand and gravel to pass out of the bladder under the use of small doses of lycopodium, berberis, epigæa, and hydrangea, which would seem to show that they possessed some specific influence.*

Treatment of the Colic.— If the physician is called at the onset of the attack, the first object is to reduce the pain. The most prompt measure is a hypodermatic injection of one-fourth grain of morphine, or one-eighth grain of morphine with 1-200th grain of atropine. I see no possible objection to this unless some idiosyncrasy of the patient forbids it. If morphine is not well borne try one-fourth or one-third grain of phosphate of codeine, or hyoscine 1-200th grain, or gelsemine 1-100th grain. If no sedative effect is seen in half an hour the dose of the selected drug can be repeated. The medicine can be given by the mouth if the injection is objected to, but the relief obtained will not appear so quickly. The hot hip-bath, hot wet compresses applied to the abdomen and flanks, hot poultices and hot enemata into the

* Glycerine in large doses has been used by Hermann, with encouraging results, for renal lithiasis. It is given dissolved in its own volume of water, at eleven o'clock each morning, in dose of fifty to a hundred cubic centimetres. Pains, and sometimes attacks of true colic, are produced on the affected side, followed by appearance of gravel or calculi in the urine, together with mucus, pus, and perhaps blood. After a time the urine becomes normal and attacks cease. The dose is repeated two or three days in succession. Temporary cures are certainly made by this method.

bowels, may aid in relaxing the ureters so as to allow the stone to pass into the bladder. When this occurs the relief is sudden, and the sufferer soon sinks into a deep sleep. I have never seen any amelioration from dry heat or cupping. It is not best to confine the patient to one position, for a change of position often aids the passage of the stone.

The passage of calculi may be aided by the *vis a tergo* of an increase of water from the kidneys. Large drafts of hot water or any hot beverage are useful. Keyes ("Genito-Urinary Diseases") says the free use of light beer is often efficacious. Many indigenous drugs have a reputation in renal colic because they were given in a hot infusion, which probably had more to do with the expulsion of the stone than the drug itself. A few grains of citrate of lithia or piperazin given in a pint of hot water may be of benefit. In this way we can give corn-silk, triticum repens, epigæa, buchu, and many other plants. It seems to me absurd to claim that minute doses of carbonate of calcium, lycopodium, nux vomica, berberis, arnica, belladonna, piper methisticum, etc., can give sudden relief to the intense pain of renal colic. Their reputation has been gained by an error in judgment, *e. g.*, the physician finds the patient in great pain; he selects some drug which appears to be indicated; a few doses are given, when the pain suddenly ceases — ceases because the stone has dropped into the bladder spontaneously, not because the drug has anything to do with its expulsion. Besides the active anodynes mentioned above, I think I have seen the pain relieved by dioscorea (especially when the pain radiates to distant parts), gelsemium, belladonna, and corn-silk, not in minute doses, but in physiological doses, *e. g.*, one teaspoonful in a pint of water, all or part drank at once. In a few cases phenacetin or antipyrin, in three-grain doses every half-hour, have appeared to mitigate the suffering.

Dr. C. E. Walton, of Cincinnati, in "The Journal of Orificial Surgery," December, 1892, reports some surprising effects from the passing of a sound into the bladder in cases of nephritic colic. So simple a procedure should not be neglected if future experience verifies the operation. Dr. Walton writes:

"He who has stood by the bedside of a patient suffering from the agony characteristic of nephritic colic, has seen the strong body writhing to relieve itself from the excruciating torture of the pain,

has heard the harrowing cries involuntarily forced from stoic lips, must have felt the need of some remedy less objectionable than morphine and more potent than the thirtieth dilution of calc. carb. To such a one is my message to-day. The means to be suggested has passed through the historic stages of most discoveries; through the stage of suggestive hint, of experimentation, of verification, and is now waiting for adoption.

(1) The suggestive hint. A patron of mine had an attack of nephritic colic while away from home; the attending physician had the pain hot-compressed, electrocuted, and medicated, but it still persisted. The great vesical and rectal tenesmus suggested to my friend, first, the use of a catheter, and secondly, of an enema. The physician was requested to catheterize him, which he did. Just as the instrument entered the bladder, the pain was increased and then speedily subsided, and in a few moments was gone and has not recurred. What caused this relief? Was the catheterization coincident with the expelling of a calculus from the ureter, or did the stretching of the prostatic urethra cause the dilation of the ureter and arrest its spasms? This could only be determined by experiment. My knowledge of reflexes led me to believe that the mechanical stretching was the cause of relief.

(2) The experiment. Talking of this subject one evening with a hotel acquaintance, he mentioned that he had been suffering for forty-eight hours, and, except when under the influence of morphine, the pain was extreme. I suggested the use of a sound, and the next day, when the morphine was failing and the pain reasserting itself, I put in a sound and gave him permanent relief in three minutes. The experiment was a success.

(3) The verification. Just about this time I opened a journal and, much to my delight, found the account of a physician who had stumbled on this mode of treatment after morphine had failed, and whilst waiting for chloroform with which to anæsthetize his patient he thought it prudent to introduce a catheter to empty the bladder. The pain was greatly increased for a moment, and then entirely subsided; the chloroform was not needed. This same physician reports eight other cases, in all but two of which relief was furnished in from one to five minutes. These cases, with my own, surely justify the recommendation of the use of the sound in this painful affliction."

It is claimed by various French authors that the paroxysms of pain may be aborted by sandal-wood oil in doses of twenty minims. (Mitchell). I have found five-drop doses every hour to relieve the dull heavy backache, extending down the ureters, which usually precedes the colic.

Massage given by a competent masseur has been known to facilitate the passage of stone.

Chloroform or ether may have to be given to partial anæsthesia, when in sensitive subjects convulsions appear or are imminent. A teaspoonful of chloroform water every ten minutes will relieve some severe cases.

NEPHRITIS (Bright's Disease).

Recent pathologists have decreed that acute and chronic inflammation of the kidneys should be designated acute and chronic Bright's disease. It is not quite clear to me why this should be so, unless it is to perpetuate the fame of the physician who first wrote a clear account of these diseases of the kidneys. Acute and chronic nephritis was known and described before the time of Dr. Bright, but was never before described so well and so clearly. I see no objection, however, to the present nomenclature.

ACUTE DIFFUSE NEPHRITIS.

Definition.— This may be described as an acute interstitial or desquamative nephritis, but in all instances pathological changes occur in the vascular, epithelial, or intertubular tissue. The common causes are: (1) Exposure to cold and dampness combined; it rarely occurs from warm dampness. A very common cause is exposure to cold, even dry cold, when the body is hot and perspiring after violent exercise, after drinking freely of liquor, or cooling off suddenly with wet clothing on. (2) The poison of all the specific fevers, particularly scarlet fever. It may occur after measles, small-pox, diphtheria, typhoid fever, cholera, yellow fever, and meningitis. It has been known to occur during syphilis and tuberculosis and as a result of septicæmia. (3) From drugs; especially those which irritate the kidneys. Cantharis, turpentine, chlorate of potassium, and carbolic acid more frequently cause it than any other, but

any drug having an affinity for the kidneys, if taken in toxic doses, may cause acute nephritis in one of its forms. It has been asserted that aloe will cause nephritis, but it has not been proven. Osler says, "Alcohol probably never excites an acute nephritis," but we know it will cause chronic Bright's disease.

Morbid Anatomy.— In mild cases the kidneys may present to the naked eye no marked change, but in the more severe forms they are congested, swollen, dark, and the section may drip blood. In severe cases while the surface appears pale and mottled, the capsule when stripped off shows the cortex swollen, turbid, and of a grayish-red color, and the pyramids of an intense beefy red. The glomerula are red, swollen, and congested, or they may be pale.

Symptoms.— When nephritis follows a chill or a cold from exposure the onset is sudden. In children convulsions may usher in the disease. Chills or rigors are present. Pain in the back, with nausea, and vomiting, are often present. It is surprising, however, how few painful symptoms are present in acute nephritis. The popular idea of inflammation of the kidneys is, that there must be violent pain in the back, extending to loins, bladder, and attended by painful urination, like the symptoms which occur from renal caculi and their passage down the ureters.

When nephritis follows a cold, dropsy may occur in twenty-four hours. After scarlet fever, it appears later, usually during desquamation, or several days or weeks after, when a puffiness about the face, eyes, or ankles is observed. Rarely in adults is there much fever, but in children the temperature may for a few days range from 101° to 103°.

It is therefore not the subjective kidney symptoms, but the objective changes in the urine which will enable us to diagnose the disease. The urine may at first be suppressed, though generally it is only scanty, very high-colored, containing blood, albumen, and tube-casts. The color may vary from a smoky-brown to a porter-red, rarely bright red. The specific gravity may be 1.025 or more, and the quantity reduced to only two or five ounces in twenty-four hours. In children after scarlet fever, often no more than an ounce is passed during a day and night. The urine on standing in a cool place deposits a heavy sediment. Under the microscope (see Mitchell, or Millard on "Diseases of the Kidneys") are shown blood corpuscles,

epithelium from the urinary passages, and casts, blood, epithelium hyaline or granular in character. Albumen is abundant, forming a thick curdy precipitate on boiling and the addition of nitric acid. Sometimes this test is not delicate and accurate enough, when other and later discovered tests should be used.

Anæmia is one of the most marked of the early symptoms, and persists until the disease is arrested, or increases until death occurs. Dropsy is always present; either general anasarca, or local effusion. In nephritis from scarlet fever all forms of dropsy may be present. The lungs may become œdematous, effusion may take place into the pleura, peritoneum, or pericardium. In some cases the extremities only are dropsical. The heart may become rapidly dilated, and this aggravates the general dropsical condition. The pulse is often hard, the arterial tension increased, and the second aortic sound accentuated. The skin is dry, and it is very difficult to cause sweating.

In a few cases uræmic symptoms appear. They may occur at the onset when the urine is suppressed, or later when the function of the kidneys are almost lost.

Epistaxis and purpura may set in if the disease is severe. Ocular changes are not as common as in chronic cases, but they do sometimes occur.

Diagnosis.— Not every case in which albumen, or even tube-casts are found in the urine, should be called acute Bright's disease. These may appear during transient febrile attacks from the use of large doses of drugs, and during pregnancy, without indicating serious renal trouble.

Prognosis.— Under judicious treatment cases caused by cold generally recover. Scarlatinal nephritis is more obstinate. In eight or ten days, if the progress is favorable, the dropsy diminishes and the urine increases, the albumen lessens, and at the end of a month the dropsy has disappeared and the urine is normal. In some cases recurrent attacks occur from exposure or other causes, ending eventually in chronic Bright's disease.

Treatment.— It should be borne in mind that the medicinal remedies for acute nephritis are those drugs which have been known to cause it. The old school dimly appreciate this truth, for the few drugs which they have found to have any specific value belong to that class. Osler makes the astounding assertion that "No remedies,

so far as known, control directly the changes going on in the kidneys." The difficulty with that school is, however, that owing to traditional usage they use doses which generally aggravate the disease, but this result rarely influences them to use small and non-irritating doses. Millard is one of the few who seem to have some idea of the true action of small doses.

The medicines which I have found most effective in acute Bright's disease are cantharis, turpentine, oil of sandal-wood, copaiva, pichi, apis, equisetum, benzoate of ammonia, and aurum muriaticum. I have never found arsenic of the slightest value; hepar sulphur undoubtedly hastens the desquamation, and limits it. In a few cases mercurius corrosivus has given good results. I will not give the indications, as they are fully given by Lilienthal and Mitchell, except for pichi and oil of sandal-wood, of which we have only brief provings. The former I consider indicated when blood is found in the urine in large quantity, associated with epithelial, waxy, and granular casts; the latter when pain in lumbar region is complained of, and the urine is highly albuminous.

In addition to medicinal agents, dietetic and hygienic treatment is indispensable. Drugs alone will not cure a single case. The patient should — as soon as we suspect the presence of a nephritis — be put to bed, and there remain until all trace of the disease has disappeared. He should be clothed in thin fine wool or canton flannel; sufficient woolen blankets should cover him to induce a gentle perspiration all the time. If sweating is not induced by them, pilocarpine 2x in two or five grain doses every two hours should be given, which rarely fails to cause perspiration. The tincture of sambucus niger is also valuable in such cases — ten to fifteen drops every hour. An infusion of the flowers, drank hot, is often more effectual. The diet should consist of milk, buttermilk, gruels made of arrow root, barley, oatmeal, or sago. If the patient is very weak, chicken or lamb broth may be permitted, but no beef tea. A milk and water diet is safest in bad cases. I always give the milk diluted one-half with Vichy, seltzer, Poland, or pure distilled water. It is better borne by the stomach and acts better on the kidneys when given with a pure or an alkaline water. Lemonade with white of egg acts favorably. The addition of one drachm of cream of tartar to a pint of lemonade makes it one of the most soothing yet effectual diuretics known. It

keeps the kidneys flushed and washes out the debris from the tubes; moreover, this beverage keeps the bowels open, which is a very important aid to the cure in all cases. Never allow constipation to exist. If this drink does not open them flush the colon every day with pure boiled water. In adults or young persons, there are some adjuvant measures which are valuable. If there is severe pain in the back with hæmaturia, dry cupping over the kidneys will aid the action of pichi or cantharis. Hydropathic measures, such as the wet pack, the vapor bath, aided by jaborandi or pilocarpine, greatly aid in diverting the strain from the kidneys and dispersing the dropsy. In adults I have succeeded in averting serious dropsical effusion by the use of apocynum, elaterium, or the use of purgative doses of Epsom salts—(a teaspoonful or tablespoonful of a saturated solution every three or four hours).

If the arterial tension is high, it is important to lessen it. In strong patients veratrum viride will act well. If not, give muriate of gold and sodium 2x, one grain every hour until the tension is lowered. With this lowered tension diuresis will occur. In a few cases I have seen excellent results from glonoine 2x, five to ten drops every two hours.

If the heart is weak and the pulse soft, irregular, or intermitting, digitalis, strophanthus, cactus, or adonis are indicated, but never when the pulse is small and hard. I have found the tincture of muriate of iron or the ethereal tincture of the perchloride indispensable when there is anæmia. Two to five drops three times a day act well. Other remedies can be given in alteration with it.

CHRONIC PARENCHYMATOUS NEPHRITIS.

Definition. — This includes chronic desquamative, and chronic tubal nephritis; and chronic diffuse nephritis with exudation.

These conditions may follow acute nephritis from cold, scarlet fever, or pregnancy, but more frequently they come on insidiously as the sequel of fevers. Beer and alcohol are thought to cause many cases. I believe that excessive beef-eating is a common cause. I doubt if tuberculosis or malaria ever cause this disease, but I am convinced from many observations that syphilis is more often a cause than is generally supposed.

Morbid Anatomy. — There are three varieties of this form of nephritis.

(1) The large white kidney, in which the organ is enlarged, the capsule thin, and the surface white, with the stellate veins injected. On section the cortex is swollen and yellowish white in color, and often presents opaque areas. The pyramids may be deeply injected. The epithelium is granular and fatty, the tubules of the cortex distended, containing tube-casts. The interstitial tissue is everywhere increased.

(2) The small white kidney, or pale granular kidney, in which, after an increase in the connective tissue, a shrinkage occurs. It may not always be preceded by enlargement, and may be a primary form. When cut into it is found that the normal resistance is greatly increased, the cortex reduced, presenting numerous opaque, white, or whitish yellow foci consisting of fatty epithelium in the convoluted tubes. It seems to be a combination of contracted kidney with areas of marked fatty degeneration.

(3) Chronic hemorrhagic nephritis, in which the organs are enlarged, yellowish white in color, and in the cortex many brownish red areas due to hemorrhage into and around the tubes.

Symptoms.—These varieties generally follow an acute nephritis. They may, however, come on insidiously. After an attack of dyspepsia or a period of failing health the patient becomes pale and weak, and puffiness of the eyelids and swollen feet are noticed in the mornings. The urine is usually diminished, often very scanty. It has a dirty yellow, smoky color, and is turbid with urates. In the heavy sediment which falls after standing are found many tube-casts of various forms and sizes, hyaline, granular, fatty, and epithelial. Leucocytes are abundant. Blood globules are frequent. Albumen is abundant; sometimes nearly one-half or two-thirds of the urine, especially in the day urine. The specific gravity is high. Dropsy is always a marked and obstinate symptom. The face is pale and puffy, the eyelids are quite œdematous in the morning. Anasarca is general, and there is effusion into the serous sacs. The pulse-tension is usually increased, the blood-vessels become stiff, and the heart is hypertrophied. In many cases there are retinal changes. Vomiting and diarrhœa are frequent. It is sometimes impossible to diagnose by the symptoms the presence of one form

of this disease from the other — the large from the small kidney.

Treatment.—The diet and regimen recommended for acute nephritis is applicable to these forms. The remedies are the same, especially aurum, glonoine, amyl, kali-cobalto nitrite, and pilocarpine, when arterial tension and enlarged heart exists.

Apis, mercurius corrosivus, helonias, sepia, arsenic, apocynum, and perchloride of iron, in the large white kidney.

Phosphorus, plumbum, berberis, euonymin, arsenite of antimony, and argentum, in contracted kidney.

Turpentine, erigeron, millefoil, coccus cacti, and pichi in the hemorrhagic kidney. The patient should seek a warm, moist but non-malarious climate, and reside there until he is cured.

CHRONIC INTERSTITIAL NEPHRITIS.

This includes those forms which have been designated contracted kidney, granular kidney, cirrhosis of the kidney, gouty kidney, and sclerotic kidney.

There are three varieties of sclerotic kidney: (1) the pale granular or secondary contracted kidney, a sequence of the large white kidney; (2) an independent primary disease; (3) a result of arterio-sclerosis.

These forms of Bright's disease are the most frequently met with, and constitute nine-tenths of all cases coming under treatment. It seems to be a hereditary disease in some families. In many cases no satisfactory cause can be assigned. Syphilis, alcohol, beef-eating, lead-poisoning, drugging with patent medicines recommended for Bright's disease, lithæmia, gout, a cold and damp climate, and, above all, intense worry and strain of business, with hurried eating and lack of exercise, are the chief known causes.

The arterio-sclerosis which comes with premature or natural old age is a prominent factor in the causation of Bright's disease.

The morbid anatomy of this form is briefly described as follows by Osler: "The kidneys are usually small, and together may weigh no more than an ounce and a half. The capsule is thick and adherent; the surface of the organ irregular and covered with small nodules, which have given to it the name of granular kidney. In strip-

ping off the capsule, portions of the kidney substance are removed. Small cysts are frequently seen on the surface. The color is usually reddish, often a very dark red. On section the substance is tough and resists cutting; the cortex is thin, and may measure no more than a couple of millimetres. The pyramids are less wasted. The small arteries are greatly thickened and stand out prominently. The fat about the pelvis is greatly increased.

"Microscopically there is seen a marked increase in the connective tissue and degeneration and atrophy of the secreting structures, glomerular and tubal, the former being most predominant and giving the main characters to the lesion." . . . "The view most generally entertained at present is that the essential lesion is in the secreting tissues of the tubules and the glomeruli, and that the connective-tissue overgrowth is secondary to this. Greenfield holds that the primary change is in most instances in the glomeruli, to which both the degeneration in the epithelium of the convoluted tubules and the increase in the intertubular connective tissue are secondary."

"Associated with contracted kidney are general arterio-sclerosis and hypertrophy of the heart. The changes in the arteries will be described in the section on arterio-sclerosis. The hypertrophy of the heart is almost constant. I do not remember ever to have seen a well-marked instance of contracted kidney without some hypertrophy of the left ventricle, and the enlargement may reach an extreme grade. The variations depend, no doubt, in part upon the extent of the diffuse arterial degeneration, and there are instances in which the term *cor bovinum* may be applied to the enlarged organ. In such cases the hypertrophy is not confined to the left ventricle, but involves the entire heart. The explanation of this hypertrophy has been much discussed. It was at first held to be due to the increased work thrown upon the organ in driving the impure blood through the capillary system. Basing his opinion upon the supposed muscular increase in the smaller arteries, Johnson regarded the hypertrophy as effort to overcome a sort of stop-cock action of these vessels, which, under the influence of the irritating ingredient in the blood, contracted and increased greatly the peripheral resistance. Traube believed that the obliteration of a large number of capillary territories in the kidney materially raised the arterial pressure, and in this way led to the hypertrophy of the heart; an additional factor,

he thought, was the diminished excretion of water, which also heightened the pressure within the blood-vessels."

"In our present knowledge the most satisfactory explanation is that given by Cohnheim, which is thus clearly and succinctly put by Fagge: He gives reasons for thinking that the activity of the circulation through the kidneys at any moment — in other words, the state of the smaller renal arteries as regards contraction or dilatation—depends not (as in the case of the tissues generally) upon the need of those organs for blood, but solely upon the amount of material for the urinary secretion that the circulatory fluids happen then to contain. This suggestion has bearings upon the development of hypertrophy in one kidney when the other has been entirely destroyed. But another consequence deducible from it is that when parts of one kidney have undergone atrophy, the blood-flow to the parts that remain must, cæteris paribus, be as great as it would have been to the whole of the organs if they had been intact. But in order that such a quantity of blood should pass through the restricted capillary area now open to it, an excessive pressure must obviously be necessary. This can be brought to bear only by the exertion of more than the normal degree of force on the part of the left ventricle, combined with the maintainance of a corresponding resistance in all other districts of the arterial system. And so one can account at once for the high arterial pressure and for the cardio-vascular changes that are secondary to it." (Osler.)

Symptoms.—The insidious nature of this disease, and its approach, are such that it is rarely recognized until the occurrence of one of the serious or fatal complications. An advanced grade of contracted kidney may be compatible with great mental and bodily vigor. There may have been no prominent symptoms to suggest the presence of a serious disease. So varied and complicated is the clinical picture of Bright's disease that it is considered best by nearly all writers to take up the symptoms under the various systems; which I shall do.

(1) *The Urinary System.*—The amount of urine is usually increased. The frequency is also augmented. The patient has to get up two or three times at night to empty the bladder. There is nearly always increased thirst. Generally relief is at first sought for these symptoms. But it should be remembered that frequent urination at

night is also a symptom of irritable bladder or prostrate, or hyperacidity of the urine. The urine is clear, light yellow, with no appreciable sediment, and the mucous cloud is well marked. The specific gravity ranges from 1.005 to 1.012. Traces of albumen are found, especially in the morning. In the scanty sediment only a few hyaline or granular casts are found. The solid constituents of the urine are generally diminished. Occasionally blood occurs in the urine, and rarely hæmaturia.

(2) *Circulatory System.*— The tension is generally increased and the artery stiff. The pulse is hard, showing thickening of the vessel wall. The pulse of increased tension has the following characters: It is hard and incompressible, requiring a good deal of force to overcome it. It may be impossible to obliterate the pulse-wave. It is persistent and in the intervals between the beats the vessel can be rolled like a cord under the finger. The pulse may be hard and of high tension, however, when the wall of the vessel is not thickened.

Fibroid arterio-sclerosis is not necessarily a cause of this high tension. Dr. Broadbent says: "It will, then, be taken as proved that the high arterial tension of contracted granular kidney is due to arterio-capillary contraction, and not to arterio-capillary fibrosis or degeneration, the contraction being provoked by the presence in the blood of some matter which acts as an irritant. The fact that increased blood-pressure often precedes the kidney mischief shows that it is not due purely and simply to deficient renal elimination, but it cannot be doubted that, when disease of the kidneys is established, the retention in the blood of waste products which ought to have passed out of the system by these organs adds to opposition in the capillaries, and becomes an important factor, perhaps the most considerable factor, in the production of the high arterial tension. Additional certainty is given to this conclusion by the fact that other affections of the kidneys at once give rise to increased blood-pressure, and that it is in chronic Bright's disease that arterial tension reaches its maximum." The heart sympathizes with this high-pulse tension. Dr. Broadbent clearly describes the heart's condition as follows: "Coöperating with the arterio-capillary resistance to produce the renal pulse, so-called, is an increased propulsive power of the heart. The gradual advance of the renal changes and

of the peripheral obstruction to the circulation in chronic Bright's disease affords time for the heart to accommodate itself to the increased work thrown upon it, and to meet the resistance in the arterio-capillary network by hypertrophy. That the hypertrophy is a real increase of the cardiac muscular fibres and not merely an addition of adventitious fibrous tissue there can be no manner of doubt; it is demonstrated by the microscope and proved by the increase of functional energy. In the late stages of the disease, when the heart is worn out, an excess of fibroid material is present, and the proportion at all periods will vary according to individual tendencies and mode of life; it may be larger, for example, in cases of alcoholism, but the characteristic change in the heart is true muscular hypertrophy, the result of excessive functional exercise.

The apex-beat is displaced downwards to the sixth or even the seventh space, and carried somewhat outwards; it is a genuine thrust, and not a mere shock, and the cardiac impulse generally is powerful. The first sound, as heard at the apex, is dull and prolonged, while over the aortic area it is scarcely, if at all, audible. At an advanced period of the disease, when the heart has begun to suffer from the effects of protracted over-work, and in some cases throughout, the first sound is reduplicated over a larger or smaller area near the apex. The aortic second sound is loud and accentuated both in the right second space and at and to the left of the apex. It would almost appear from the considerations stated that the heart and vessels were engaged in a work of mutual destruction, and such is indeed the fact, as is testified by cerebral hemorrhage and valvular and structural disease of the heart. It is, however, probable that other evils are averted which would prove fatal sooner, and that high arterial tension is really the result of a defensive reaction."

(3) *Respiratory System.*—Œdema of the glottis or of the lungs may occur suddenly, also effusion into the pleuræ. Acute pleurisy and pneumonia are common. Bronchitis may occur, especially in winter. Dyspnœa at night is not infrequent. This may be an uræmic or a cardiac symptom. Cheyne-Stokes breathing generally appears toward the close, but sometimes when the patient is up and walking about.

(4) *Digestive System.* — Uncontrollable vomiting may be the first symptom of a serious nature. This is generally believed to be

due to uræmia. It has been known to be fatal before there was any suspicion of chronic Bright's disease. Dyspepsia and loss of appetite is generally present. Severe and even fatal diarrhœa has been known to occur.

(5) *Nervous System.*—Cerebral apoplexy is a common concomitant of interstitial nephritis. The mind may be clouded, and the patient become insane, have hallucinations and illusions. Neuralgias are often severe and intractable.

(6) *Eyes.* — Abnormal conditions of vision are often the first symptom of the disease. The opthalmologist often discovers the presence of Bright's disease before it is suspected by the regular attendant. Sudden blindness may occur before retinal changes.

(7) *Ears.*—Ringing in the ears; various forms of deafness; and other auditory troubles often attend the disease.

(8) *The Skin* is dry and pale; the patient rarely sweats, and when he does a white frost of urea may be deposited on the surface. Eczema is a common accompaniment. The fingers may be numb and tingling, and are cold. Epistaxis and other hemorrhages are frequent. Intolerable itching and muscular cramps are not uncommon. Ascites and œdema of the skin are rare, unless there is cirrosis of the liver.

Diagnosis. — The early stages of interstitial nephritis is rarely recognized. Osler gives the following important indications of the presence of this disease: "In a patient with increased pulse-tension (particularly if the vessel wall is sclerotic), with the apex-beat of the heart dislocated to the left, the second aortic sound ringing and accentuated, the urine abundant and of low specific gravity, with a trace of albumen and an occasional hyaline or granular cast, the diagnosis of interstitial nephritis may be safely made. Of all the indications, that offered by the pulse is the most important. Persistent high tension with thickening of the arterial wall in a man under fifty means that serious mischief has already taken place, that cardio-vascular changes are certainly, and renal most probably, present. It is important in the diagnosis of this condition not to rest content with a single examination of the urine. Both the evening and morning secretion should be studied. The sediment must be collected in a conical glass, and in looking for tube-casts a large surface should be examined with a tolerable low power and little light. The arterio-

sclerotic kidney may exist for a long time without the occurrence of albumen, or the albumen may be in very small quantities. In many cases it is impossible to differentiate the primary interstitial nephritis from an arterio-sclerotic kidney, nor clinically is it of any special value so to do. In persons under forty, with very high tension, great thickening of the superficial arteries, and marked hypertrophy of the heart, the renal are more likely to be secondary to the arterial changes."

Prognosis. — Old-school authorities take very pessimistic views of the curability of chronic Bright's disease. They consider it "an incurable affection, and as much beyond the reach of medicines as wrinkled skin and gray hair." The homeopathic school are too optimistic. Buchner in his "Morbus Brightii" implies that a large proportion of cases are curable "if we can find the true homeopathic remedy." When we consider how obscure and unrecognizable are the symptoms, we can only look on this assertion as an excuse unworthy an honest writer. If we include all forms, the acute as well as chronic, I am willing to admit that we may cure a larger proportion of cases than the old school. We certainly have more potent palliative remedies, and can lengthen the duration of life by their judicious use. Because a man has increased arterial tension, with or without thickening of the arterial walls, polyuria with a small amount of albumen, and a few hyaline casts, we must not condemn him to die or abandon the pursuits of an active life. We may hold the disease in check, and ward off the fatal end, but we cannot promise a cure.

Treatment.—The only work on the treatment of this disease which has yet appeared in our school —"Buchner on Morbus Brightii"— is of small value, on account of its confounding the acute with the chronic malady. The indications for medicines are confusing, impractical, and largely theoretical. Dr. C. Mitchell gives a better *resumé* of the treatment, but it is by no means complete nor was it intended to be, as his work was intended more as a work on diagnosis, than treatment. Millard's is the most practical work, and the treatment is liberal and free from sectarian bigotry. The hygienic treatment is of the greatest importance. So soon as the disease is discovered the patient should so regulate his life as to throw the least possible strain on the kidneys, heart, and arteries. A quiet life with-

out mental worry, free from the excitement of speculation or money-making, is all-important. A residence in an equitable climate, according to Purdy, is the best preventive of fatal results. Purdy's researches show that the largest mortality from Bright's disease occur in the New England and Northern States — in the region of the Great Lakes,— and the lowest mortality in the Gulf and lower Atlantic States. I believe Georgia, Florida, and Alabama are the best states for sufferers from this disease, and lower Florida probably the best of all locations. In no disease is it so important to see that the normal functions of the skin are performed. This is not conduced by frequent washing with soaps, which destroy the natural oil of the skin, but by daily sponging with pure soft water, followed by a good rubbing and inunction with some pure vegetable or animal oil. An occasional Turkish bath, under due precautions, followed by inunctions of oil, is not objectionable. I have traced many cases of Bright's disease back to a Turkish bath followed by exposure to cold and dampness or a ride in an open street-car or carriage.

Woolen underclothing is indispensible in all climates, the tropical as well as temperate, in order to guard against a chill from change of temperature at night, or after exercise.

The best beverage is pure spring water. There are no "mineral waters" which have any curative influence over this disease. The much vaunted waters of Waukesha, Poland, Bedford, Saratoga, Vichy, and Carlsbad are only valuable because they are pure water, and as such help the interstitial circulation and keep the drains flushed. The less mineral matter the water contains, the better it is for this purpose.

The diet should be nourishing but light. Meat should be eaten but once a day, and beef should be rarely if ever eaten. Each meal should be light — never a surfeit. Tea and coffee can be taken, but alcohol rarely if ever. It is a lamentable mistake to send patients with this disease to drink the waters of fashionable places of resort. They live in crowded hotels, take but little exercise, eat and smoke too much, sleep in close rooms, and lounge on piazzas.

Pure water can be taken as well at home, or in the country where there is fresh air, no excitement, and no temptation to over-eating.

A summing up of the opinion of the best authorities seems to be

this: The best diet is an almost exclusive milk diet. The arguments in favor of this diet are: (1) Milk is easily assimilated and is therefore well adapted to a disease in which digestive disturbances are almost the invariable rule. (2) If a suitable amount of milk be taken daily it provides sufficient nutriment for the needs and proper support of the economy. (3) An exclusive milk diet forms less urea in the blood than any other form of alimentation. (4) Milk furnishes a large quantity of fluid to flush out the kidneys with, always supposing it is taken at short intervals and in fairly large quantities at a time. In this way it excites urinary secretion by continued excessive pressure in the arterial system, and this helps the dropsy to disappear by degrees.

Milk will be most beneficial if taken fresh from the cow, or unskimmed, for thereby we get the fats which greatly aid in the general nutrition. If it is not well tolerated, giving rise to pyrosis, acidity, heartburn, and gases, it may be peptonized by Fairchild's processes. If then it is not well borne, skimmed milk should be used, and in addition, eggs to supply the demand for oil and albumen. There are some persons who seem to have an idiosyncrasy against milk. This is often imaginary, but sometimes very real, milk seeming to act almost as a poison, just as white of egg does on some persons. I have found in such cases that malted milk will agree and can be taken in sufficient quantity. Koumiss is sometimes a good substitute for milk, and the slight quantity of alcohol it contains is specially adapted to cases in which there is great debility, and a delicate stomach. If milk disagrees when taken alone, it will not when mixed with equal parts of Vichy, Seltzer, or Deep Rock water. Milk if violently shaken a minute or two will be tolerated when unshaken milk is not. If an exclusive milk diet be insisted on, the amount taken during twenty-four hours should not be less than three or more than five quarts. It may be taken hot, warm, or cold, to suit the taste of the patient. When the stomach is very irritable it can be iced, and taken in very small quantities — an ounce every half-hour. In an exclusive milk diet it should be taken in fixed quantities and at specified hours. From a few ounces to half a pint or a pint, every two or three hours in an adult. If a mixed diet is adopted, milk should be alternated with potatoes, in soup or mashed; gruels of arrow-root, rice, granola, wheatena, corn

and oat meal; fat bacon, butter, zwiebach, broths of chicken, lamb, mutton, clam, and oysters.

There are several authorities, among them Stuart, that insist on a mixed diet, and even advise the use of meats and other nitrogenized food, in order to support the strength of the patient. Others, like Beaumetz, insist on a strict diet of milk and vegetables. It has been asserted by many, among them Senator, that albuminous food should be prohibited, on the same ground that sugar is forbidden in diabetes, but there is really no analogy. The treatment of chronic Bright's disease by special forms of diet has recently been the subject of a series of investigations by Professor Schreiber, of Koenigsberg, whose results are of some interest in view of the present position of the question. He traverses Senator's statement that one ought in cases of albuminuria to forbid the use of eggs, holding that their injurious influence is open to question. ("The Practitioner.") He took for purpose of experiment eight people suffering from kidney disease, to whom he gave along with their ordinary diet six to ten eggs daily. Before the beginning of the experiment they had been under observation from four to eight days, on the usual diet, until the fluctuation in the amount of albumen in the twenty-four hours had been determined; the estimations being likewise made for several days after the eggs were discontinued.

"In four of the cases the eggs were administered boiled; in the others raw. In the former group the patient received six eggs daily, and in none of them during the period of administration of the nitrogenous food could any fluctuation or increase in the amount of albumen be determined. In the second group six to ten raw eggs daily not only did not show an increase in the excretion of albumen, but actually led to a considerable diminution. Similar results have also recently been recorded from Leyden's wards. These observations also agree with those of Œrtel, who has stated that the addition of a great quantity of albuminous food may affect albuminuria favorably. Schreiber maintains that none of the three forms of diet, mixed, meat, or milk, appears to be capable of influencing constantly and unmistakably the excretion of albumen in kidney disease — a result he thinks, although really negative, to be nevertheless received with satisfaction when one considers that patients can never stand for any time a one-sided diet. In discussing the question how a

patient suffering from Bright's disease ought to be dieted, Schreiber recommends that to an ordinary mixed diet should be added fluid or coagulated albumen, meat, and other nitrogenous substances, and as there is not less albumen passed under a pure milk diet than under a nitrogenous one, it succeeds better to combine the two and adds to the body weight. A special diet for Bright's disease is not in the least indicated; it ought to be founded on the broadest basis, bearing in mind that the disease is an affection gradually and steadily consuming the bodily strength; while the forms of diet should be given according to the want and necessity, and without the unjustifiable and exclusive endeavor to compensate or change the loss of albumen by the urine."

Medicinal Treatment. — There are no specific remedies for that composite condition known as Bright's disease. No known drug will cause the totality of the symptoms found in that disease. We must treat the manifestations as they arise.

High arterial tension being the most prominent symptom, we should direct our efforts to bring it down to a normal. I do not here refer to the high tension of arterio-sclerosis, which will be treated of in another place. The high tension of Bright's disease is rarely due to the latter, but generally to the presence in the blood of imperfectly oxydized nitrogenous wastes. The object of treatment must obviously be to keep the blood free from such impurities. Exercise and fresh air are of great importance for this purpose, and a persistent neglect of these essentials to health will defeat any attempt to rectify permanently a tendency to high pressure in the arterial system. Horse-back riding affords the best means of gaining this end. As I observed above, the greatest source of nitrogenized waste is the consumption of an undue amount of nitrogenized food. This should be limited to a minimum compatible with the health and vigor of the patient. All meats come under this head, the most injurious being beef; but mutton, fowl, and game cannot be eaten with impunity. Soups, owing to the large quantity of extractive meat matters they contain, should be sparingly used. Broadbent calls attention to the fact that in some cases high pressure in the arteries may be simply one result of a general superabundance of fluid in the blood and tissues, and that it may be necessary to reduce the volumes of blood by restricting the amount of liquid drank.

When drink is limited, the restriction should apply especially to meal-times. Between meals the effect of drinking water is very different from when it is taken with food. Water in considerable quantity, when taken on an empty stomach, flushes the secreting glands and washes out the tissues, and is thus a valuable means of eliminating impurities. The best time for drinking is night and morning, and the effects are greater when fluid is taken hot. At night, hot water stimulates the stomach to contract, gases are expelled, and undigested contents swept on into the duodenum, and usually there is a general relaxation of the arterioles — in this way it often conduces to sleep. In the morning it is rapidly absorbed and has a greater effect on the glands and tissues. If the patient is sent to drink the water of springs, or if he takes them at home, he should be directed to rise early, drink one or two glasses of the water, hot, an hour before breakfast, and walk ten or fifteen minutes. This will enable the water to promote blood and tissue metabolism, and carry off waste products.

The best medicinal eliminant is potash and its salts, and Broadbent asserts that liquor potassæ is better than the salts, and that the carbonate is better than the citrate, the citrate and acetate better than the phosphate, nitrate, or sulphate. The soda salts have some eliminant influence, but cannot be compared with the potash. Ten to twenty grains of any of the potash salts in a glass of hot water, on rising in the morning or on going to bed, is sufficient.

A few of our school still object to the use of these quantities, for the insufficient reason that they are "not homeopathic." No one supposes they are. They act chemically and mechanically, and their action has no more to do with the law of similia than does the food we eat, or the air we breathe. The aid they give us, when taken with water, is so great and beneficial that we cannot afford to neglect them. We have no medicines which are homeopathic to the high arterial tension similar to that occurring in Bright's disease. Digitalis, strophanthus, ergot, and a few others, contract the arteries, but they act through the vaso-motor system, do not cause retention of waste in the blood, and cannot be used to advantage in renal high-arterial tension. We must therefore rely on those drugs which physiologically dilate the arteries by acting on the vaso-motor centres; or clearing the blood and tissues of waste matters. Those

belonging to the first class are nitroglycerine, nitrites of sodium and potassium, chloride of gold and sodium, chloral hydrate, and veratrum viride. The best of these is glonoine, which can be given in doses varying from 1-200th to 1-25th of a grain three times a day. No regular dose can be advised, owing to the varying susceptibilities of individuals. In some, 1-200th of a grain (one-half drop of the one per cent solution) will cause its peculiar physiological effects. In others it will require 1-20th of a grain. Several cases of high arterial tension have been reported where it required one grain a day to relax the contracted and rigid arteries.

The nitrites of sodium and potassium may be given in doses of one to five grains of the 1x trituration, the cobalto-nitrite in doses of one-eighth to one-half of a grain, and the chloride of gold and sodium in doses of 1-100th or 1-20th of a grain (one to five grains of the 2x trituration). Whichever medicine is given it must be pushed until its relaxing effect is produced, and when the normal tension is present the dose may be slightly decreased. Osler and others have given glonoine for many weeks, and observed none but the best effects. I usually give it a week or two, then suspend its use a few days to see if the good effects continue. If not I order it resumed. Those drugs which relax arterial tension through their eliminant action, probably acting through the agency of the liver, are mercurius, euonymin, iridin, chelidonium, carduus, podophyllin, and a few others of that class. Probably the drug which acts the most promptly is mercurius dulcis (the calomel of the old school). Again and again have I seen the high arterial tension of Bright's disease become lowered by repeated doses of the 2x, given until some laxative action was produced. In cases of long standing the 1x is required in doses of one to ten grains repeated every two hours. If the case was urgent I have not hesitated to give two or three doses of five grains each. Dr. Broadbent, in his monograph on "The Pulse," says: "An attack of apoplexy may be staved off by a timely dose of calomel, and by the same means a laboring heart, unable to cope with the resistance in the arterioles and capillaries, may at once be relieved. The great remedy for mischief of any kind impending as a result of high blood-pressure is a mercurial purge. The effect of mercury employed as an aperient upon abnormal tension in the arteries is a matter of observation. The method by which the effect is produced

is a question of hypothesis, but there can be no doubt that it is by elimination, and there need be but little hesitation in concluding that the seat of the accelerated metabolism, of which the elimination is a resultant, is the liver. Such, at any rate, is the working hypothesis by which I am guided. It may be added, perhaps, that I entered upon the independent study of medicine fully impressed with the view of teachers held in high respect and confidence, who considered that the action of mercury on the liver had been entirely disproved, and that mercury, indeed, has practically no useful place in medicine, and that it has been from my experience of its effects on blood-pressure that I have come to value it as one of our most important remedies. Full doses of calomel being reserved for emergencies, the less serious symptoms may be met by the administration of a single grain of a pill of mercury with ipecac, and rhubarb or colocynth twice or three times a week, with which may be combined from time to time a three-weeks' course of mild salines. To intermediate degrees of urgency may be adapted suitable doses and combinations." Many of our school will cavil at this treatment. If they can do as well with infinitesimals let them publish their experience.

Euonymin is one of our best remedies for the high arterial tension of Bright's disease. Dr. W. H. Holcombe reports a rapid reduction of albumen with general improvement in a patient with Bright's disease. Taken in doses of the one-hundredth or one-tenth grain four times a day, with the morning and evening use of hot water, with phosphate of soda or Carlsbad salts, its beneficial action will soon show itself.

Veratrum viride has been rarely used by either school, except in fevers, but it is invaluable in many cases of high arterial tension. When the pulse is hard and unyielding, and the heart action denotes beginning or established enlargement with thickening of the walls of the ventricles, then this drug is indispensible. Begin with ten drops of the 2x, and in a few days, if the tension is not reduced, give ten drops of the 1x every two or three hours, which will soon produce a large, soft pulse. Beyond this normal pulse do not go, for, as Osler observes, a certain increase of tension is not only necessary but unavoidable in chronic Bright's disease, and probably the most serious danger is too great lowering of the blood-tension. The happy medium must be sought between the heightened tension that throws a serious strain

upon the heart and risks rupture of the vessels, and the low tension that under these circumstances is liable to be associated with serous effusions.

I have known great high tension suddenly give way to too low tension, not caused by medicines, but by too great a strain. This condition simulates the secondary effects of digitalis and its analogues. This is their sphere of curative action, when they will prevent serous effusions.

Albuminuria, next to the high arterial tension, and as a consequence thereof, is perhaps the most important symptom of Bright's disease. The drain of albumen from the blood is the greatest cause of the anæmia and prostration. If by any means we can lessen or arrest the waste of albumen we can save the vigor of our patient. The presence of albumen is due to the high arterial tension, and to an irritation of the kidneys. While we give medicines to lower the tension to normal we must see that the food or beverages of the patient do not irritate the kidneys. The albuminoid foods should not be taken in excess; neither should nitrogenous foods, for they raise the arterial tension. A vegetable diet diminishes the excretion. Rest diminishes the amount of albumen; fatigue increases it. Cold bathing increases it, also mental labor. Sexual excitement greatly increases its excretion.

Have medicines any influence on the excretion of albumen? Brunton says digitalis and strychnine cause it. Allen gives in "Index of Symptoms" of his "Encyclopædia of Pure Materia Medica" the following as causing albuminous urine: Absinthe, alcohol, ammonia (caustic), antimony, blatta, cantharis, carbolic acid, carbon disulphide, copaiva, sulphur of copper, glonoine, iodine, chlorate of potassium, corrosive mercury, morphine, muriatic acid, muriate of sodium, osmium, petroleum, phosphorus, phytolacca, plumbum, pulsatilla ricinus, secale, sulphuric acid, tobacco, taxus, and uranium. It is among these medicines that we should expect to find our remedies to check the excretion of albumin. Doubtless nearly all of them are homeopathic to albuminuria, although some are of doubtful value. When it is remembered that even in the hands of an expert, albumin is sometimes difficult to detect, and that many substances simulate albumin and may deceive one not an expert, we are naturally skeptical of the value of statements made by provers. However, it

is a fact that cantharis, copaiva, corrosive mercury, cyanide of mercury, phosphorus, phytolacca, petroleum and plumbum, have been capable of checking the secretion of albumin.

Empirically it has been proven that muriate of gold, muriate of iron, iodide of potassium, bromide of strontium, equisetum, cubebs, turpentine, sandal-wood oil, apis mel., and many other renal irritants, have been found to check the excretion of albumin.

The medicines which I have found of the most decided value in albuminuria are muriate of gold and sodium, turpentine, cantharis, euonymin, helonias, oil of sandal-wood, corrosive mercury, copaiva, and chlorate of potassium. I have never seen such notable effects from the muriate of iron, or the ethereal tincture of the perchloride, as have been claimed by some observers.

Lauder Brunton ("Pharmacology and Therapeutics") says tannin and tannate of soda appear to have a certain power to lessen the exudation of albumin through the Malpigian tufts, as Ribbert found that when albuminuria was produced artificially in rabbits by temporary ligature of the renal artery, both tannin and tannate of soda either lessened or prevented the exudation of albumin. Arbutin, the active principle of uva ursi, appears to be still more efficacious, but requires to be given in larger doses (four grains three or four times a day). Millard says he has used tannin and tannate of soda in doses of ten to twenty grains three times a day, and "it diminishes the dropsy and the amount of albumin."

The following cases are collected from French homeopathic journals:

Koch's Lymph in Albuminuria. Case 1. — Acute Parenchymatous Nephritis: General dropsy; scanty, sanguinolent, very albuminous urine (four grains per litre). Apium virus 6th and cantharis 6th diminish general dropsy and bloody urine disappears, but albumin, after diminution, is stationary at one-half gram. The Koch's lymph at the sixth attenuation is prescribed. After eight days of the use of this remedy, albumin disappeared entirely; but the patient, a few days after, ate, and drank wine, and the albumin reappeared.

Case 2. — Chronic Interstitial Nephritis: Case of long duration; uræmic vomiting and convulsions, general arterio-sclerosis; glonoine, fuchsine, nux vomica, iodium are taken before the Koch's remedy, and stop vomiting and convulsions. Urine, 1 1-2 litre per day; albu-

min, 0.40 gram; and urea, only six grams per litre. Koch's lymph, 6th, is given with the milk diet a few days after, urine increases (three litres per day) and albumin diminishes (0.25 gram). Later, Koch's lymph, 3d, is prescribed with a mixed diet, milk, eggs, potatoes, and ham, and albumin disappears entirely. Two months after, no trace of albumin with the usual tests, but a very sensitive one reveals some faint traces of albumin, and pale and copious urine indicates still the existence of sclerosis of kidney. In fact there is a great amelioration, but we must await the result of the case to pronounce the word "cured."

Case 3.—A woman, with a cardiac lesion, and a persistent albuminuria, took the Koch's lymph, 6th, and during the use of the remedy albuminuria disappeared entirely.

Case 4.—A young lady, after grippal broncho-pneumonia, had a persistent albuminuria. Koch's lymph, 6th, cured the albuminuria in a few days.

Case 5.—Count of V., arterio-sclerosis and vascular cardiopathy; albumin from 0.25 gram to one gram per litre. The Koch's remedy, 6th, suppressed the albumin in four days. A little later the patient took some meat, and albumin reappeared to the amount of 0.50 gram per litre, and finally disappeared a few days later.

"The experiments on animals and the clinical facts have demonstrated that Koch's lymph in subcutaneous injections has an elective action on the heart and kidney. The symptoms of endocarditis and albuminuria, with or without hæmaturia, have been noted during life. The inflammation of the endocardium and the lesions of acute parenchymatous nephritis have been observed after death. In experimenting in guinea pigs, sometimes the large white kidney, sometimes the small granular kidney, has been found. Incontestibly, Koch's lymph has produced on consumptive men and on the healthy animals, endocarditis and nephritis. We are also justified in giving Koch's lymph in the treatment of nephritis, according to the law of similars. The clinical experiments need to be repeated to demonstrate the curative action of the remedy; but for the present we have a certain number of cases where Koch's lymph produced the disappearance of albumin in urine." Dr. Paul Tousset, in "Art Medica," August, 1892.

The respiratory symptoms may become very distressing. Œdema of the glottis may prove fatal to life. Apis mel. has in some cases

had a magical effect in arresting it. Pilocarpine has been very efficacious in some cases when given by the mouth in doses of one-twentieth or one-thirtieth of a grain or used hypodermatically. Both are equally useful in œdema of the lungs.

Attacks of dyspnœa at night may be controlled by aurum, glonoine, or amyl nitrite, if due to vaso-motor spasm. If the heart is weak this cardiac dyspnœa is best controlled by quebracho (mother tincture, ten drops every half-hour), or its alkaloid, aspidospermine (1-10th of a grain every half-hour).

The Gastric Symptoms.—Violent vomiting is best controlled by cocaine, bismuth, creosote, arsenite of copper, or chloroform water. Severe diarrhœa is often moderated by arsenic, arsenite of copper, veratrum, and croton tig. It is not good practice to arrest it suddenly by astringents, and never by opium, for the latter is always dangerous in Bright's disease.

Anæmia should be combatted with vigor, not only by fresh air and blood-making food but by medicines. All the preparations of iron are useful, the tincture of the muriate being especially beneficial in doses ranging from one to twenty drops three times a day. The peptonates of iron are valuable. Arseniate of iron is useful, especially the Levigo water from Tyrol which contains it, given in doses of a teaspoonful after meals. If the heart is weak, a combination of digitalis, iron, and strychnine has been of more benefit in my hands than any single remedy. Compound tablets are now made and sold in our pharmacies containing this combination.

Cardiac Symptoms.— As before stated, the arterial tension and cardiac thickening sometimes gives way, and dilatation of the heart obtains. There is a gallop-rhythm of the heart like the fœtal heart; the breath is short, the urine is scanty and highly albuminous, and signs of local dropsy appear. In such the treatment of the impending cardiac failure must be prompt and thorough. Digitalis is the main remedy. Under its use the heart regains its normal rhythm, the contraction becomes slower and stronger, the urine increases in quantity, and the albumin diminishes. The dose should not be more than ten drops, or less than five, every six hours. If for some reason it is not well borne, give convallaria or cactus, in the same doses. In a few cases, however, I have found that it required twenty to thirty drops of the tincture of cactus. The addition of 1-100th of a grain

of strychnine to each dose of the above greatly enhances their curative action.

Dropsy.— When, during the progress of Bright's disease, the renal disease becomes so extended as to injure the secreting function of the kidneys, local and general dropsy occurs from accumulation of water in the system. This is greatly aggravated if there is a gradual failure of the hypertrophied heart. We rarely find dropsy so long as the heart maintains a force equal or above its normal.

In these conditions we have two classes of medicines to select from — the cardiac tonics, and renal stimulants. Some drugs seem to possess both qualities. Among the cardiac tonics besides those above mentioned, are spartein, the alkaloid of broom; neirin, the alkaloid of oleander; erythrophleum (casca); stigmata maidis (corn-silk); adonis vernalis, caffeine, strophanthus, squill, and several others. Those who possess my "Lectures on Diseases of the Heart" will find in the last edition a full account of the powers of each cardiac drug, the dose, and best method of administration. They are not supposed to have any direct diuretic action, *i. e.*, no direct action on the secreting organs of the kidney, as do cantharis, turpentine, and others. But some recent experiments show that this belief may be an error, for it has been proved that the urine is largely increased under their use, when the heart is in a normal state.

The second class, the renal stimulants, act directly on the intimate structures of the kidney as irritants. The most prominent of these are cantharis, blatta, apis, turpentine, cubebs, copaiva, apocynum cann, eupatorium, collinsonia, juniper, bitartrate of potassium, oxydendron, piper methysticum, salicylate of theobromine (diuretin), mercurius dulcis, æclepias cornuti, barosma, eucalyptus, etc.

Of all these there are a few which my experience and observation place as the most important, namely: apis, apocynum, collinsonia, juniper, bitartrate of potassium, diuretin, and mercurius dulcis.

Apis should be prepared from the stings of the bee direct, triturated with sugar of milk, or an infusion of the bee in hot water. Apocynum from the green root and given in doses of ten or fifteen drops every two hours. Were it not for the nausea and vomiting caused by this drug and its bitter taste, nearly all cases of cardiac or renal dropsy could be dissipated, but some individuals can tolerate it but a short time. If the constituent which causes this gastric irri-

tation could be eliminated, it would make apocynum *the* most potent remedy for dropsy. I have modified this irritant quality somewhat by giving it in chloroform water. The decoction recommended in my "New Remedies" acts better than the tincture.

Bitartrate of potassium (cream of tartar) is nearly as potent as apocynum, and has the great advantage of being pleasant to the taste and non-irritating to the stomach. The dose varies from five to sixty grains three times a day, the quantity depending upon the age of the patient. It can be given in water flavored with lemon, as "lemonade," largely diluted. Mercurius dulcis has in my practice removed the most obstinate dropsies due to combined cardiac and renal disease, especially when there was jaundice. Sometimes the 2x frequently repeated, or the 1x at longer intervals, suffice to increase the urine enormously; but in some cases I have seen the most brilliant results from doses of two grains of the crude given every two or three hours, until copious, thin, and bilious stools were caused, when the dose was reduced to one-tenth of a grain every two hours, with the result of causing an enormous flow of urine, which continued until the general anasarca and local effusions disappeared. In a few cases diuretin has caused copious diuresis, with a corresponding improvement of the heart's action, but its good effects are not usually permanent, and it has to be supplemented by digitalis and strychnine. The dose is uncertain. At times ten grains of the 1x trituration, in other cases ten grains of the crude drug, repeated every hour, but when its diuretic influence sets in, the flow of urine is enormous. Owing to conditions which have not been explained, or to the improper selection of the cardiac or renal drug, there will occur instances when no agent seems to affect the heart or kidneys in a favorable manner. In such cases we are obliged to expel the water in the tissue, and cavities of the body through the intestines, by means of agents known as hydrogogue cathartics. The best and safest of these are certain alkaline salts. The sulphate of magnesium and bitartrate of potassium are to be preferred. The nitrate of potassium is equally potent, but not so safe. They should be given in saturated solution, for only in this form do they act on the bowels. If given in a weaker solution than five per cent their action is on the kidneys if they act at all, and if they do not act on the kidneys they increase the amount of water in the blood, and aggravate

the dropsy. A tablespoonful of the saturated solution of Epsom salts (magnesia sulph.), or cream of tartar, bitartrate of potassium, should be given every three or four hours. After the second dose the hydrogogue action appears and the drug should be repeated until the dropsy is relieved. Other hydrogogue cathartics are elaterium, hellebore, euphorbia, corolata, and jalap. Elaterin is the most potent and the safest. Only in rare cases does it derange the stomach, and its use can be continued for weeks or months without injury. A man under my care, with dilatation of the heart and interstitial nephritis, found no other palliative of his dropsy. For several years he took one-tenth of a grain of elaterin at night. This dose was followed by eight or ten profuse watery stools before morning, causing the general anasarca to disappear. He attended to his business on the Board of Trade during the day.

Hellebore acts only in this manner. It is not primarily diuretic, and if of any value in dropsy it should be in those which follow exhausting diarrhœas or cholera. Helleborein acts similarly to digitalin.

In the early years of my practice I often used an infusion of broom, but the discovery of its active principle, sparteine, has given us an agent vastly superior. Sparteine is very insoluble, but the sulphate is quite soluble and should be used in all cases. The average daily dose should not exceed one grain. The 1x trituration given in one-grain doses every three hours, or five grains of the 2x every two hours, is very efficient.

Dr. Rhode ("Practitioner") combines sulphate of sparteine with digitalis, convallaria, or strophanthus, and found that it acted very well.

This combination of small doses of different diuretics was in several cases borne for many weeks with an unchanging favorable action. It was repeatedly observed that diuresis set in satisfactorily only when sparteine was added. The effect of the internal administration of about one-seventh of a grain four or five times daily was unmistakable in the course of twenty-four hours; and especially noteworthy was the increase in tension of the arterial system, on which followed a rise in the flow of urine. Brachycardia similar to that produced by digitalis Rhode has never observed, but rather the resumption of a normal cardiac action where frequency has been

produced by debilitating conditions, such as great loss of albumin or in consequence of influenza. From about ninety beats the pulse frequency went down with improvement in the quality to seventy, and remained at that rate without further slowing. A particular advantage of sulphate of sparteine is its ready solubility in water, and indifferent behavior to subcutaneous tissue. A large series of injections under the skin has been made with a two per cent sparteine solution, and never were any traces of irritation seen or any complaints made about painful sensations. The subcutaneous injection shows the action upon the pulse in a few minutes. The excretion of albumin is not simply apparently less, that is from dilution, but also through a direct action of the remedy upon the primary urinary passages. Pure congestive albuminuria often completely disappears along with other œdema; but Rhode observed recently, "in a girl ten years of age, with chronic, frequently recurring, slight nephritis of some years' standing, that after twenty-four hours' use of sparteine the albumen completely disappeared." When a patient with dropsy has piles and varicosis, collinsonia is an admirable remedy. It will slow the weak rapid heart, unload the portal system, act as a gentle laxative, and produce diuresis. The dose is five drops of the tincture or 1x dilution every two hours.

Eupatorium purpureum is a good diuretic. It is indicated when there is a large quantity of uric acid or urates in the scanty and high-colored urine. Dose — the same as for collinsonia.

Oxydendron (sour-wood) has been known for many years by physicians in the South as an efficient remedy for dropsy. We have not yet sufficient accurate experience with this drug to enable us to decide as to its comparative merits in cardiac and renal dropsies. The reports unfortunately have not come from physicians capable of making an accurate diagnosis. The dose of the tincture is from twenty to sixty drops every two hours.

Vaccinium crassifolium, a trailing plant found in the mountains of the Carolinas, has been found very efficient in obstinate dropsies evidently caused by Bright's disease. It is best given in infusion, a wineglassful every two hours. The tincture may be used in one-drachm doses. Corn-silk (stigmata maidis) is a valuable remedy. It is indicated in weak and dilated hearts, a weak and irregular pulse, great irritability of the bladder and urethra, and scanty

urine, with frequent urging. The best results are obtained from the decoction of the silk, gathered when turning brown, but I have used the fluid extract in doses of ten to twenty drops every two hours with gratifying results.

Juniperus virginiana, a decoction of the berries, has long been used as a diuretic. It largely increases the watery portions of the urine. The decoction is an excellent vehicle for the administration of the bitartrate of potassium, ten to twenty grains to an ounce of the infusion, given every three hours.

Dr. Millard shows in his work on "Bright's Disease" an unusual intuitive understanding, and excellent judgment in his selection of remedies for that disease. He admits that many drugs seem to act in accordance with the law of similia.

In his mention of corrosive sublimate he says: "My experience has led me to employ, usually, the mild chloride in interstitial nephritis; and the corrosive sublimate in croupous nephritis. In some cases, without being able to tell why, I have found benefit to be derived only from the opposite course. I am accustomed to give the former, prepared by combining or triturating one part of the drug with ninety-nine parts of sugar of milk, this being an inert vehicle, the adult dose being five to ten grains every two or three hours, taking care not to give it in doses so as to affect the gums or to relax the bowels. Of corrosive sublimate I use a preparation of one part of the crude drug to 10,000 of sugar of milk (ten grains would contain a thousandth of a grain of the drug), giving eight to ten grains at the same intervals as the proto-chloride (calomel). The numerous triturations, and tablet triturates, that have recently come into use and are kept by leading druggists, as calomel, corrosive sublimate, arsenic, etc., greatly simplify the administration of small doses. Although the one-hundredth or one-twentieth of a grain of corrosive sublimate might be given in chronic nephritis, I believe such doses to be unnecessarily, if not dangerously large in acute forms. I know that the possible effect of such small doses will be regarded by many with incredulity, but their value has been demonstrated too frequently for it to be doubtful, and the recognition of the efficacy of these doses is inevitable, as it is a matter of simple and assured truth. The experience of medical men of acknowledged experience and ability is rapidly tending to show that very minute doses of

medicine accomplish, in numerous conditions, more than ponderous or even moderate doses. Particularly is this shown in those cases in which the dual action of drugs is manifest, as in the action of corrosive sublimate upon the kidneys in health and in disease."

"It is a matter of no slight interest to consider that while corrosive sublimate, alone or in conjunction with other remedies, will often correct pathological conditions characterized by the secretion of albumin, bloody urine, or suppression of urine, the same remedy taken in health, in toxic doses, often produces these very conditions. I do not propose to descant upon the merits of any theory, still less to support any supposed law of cure, but simply to present facts. In acute croupous nephritis we have cloudy swelling of the epithelia and increased bulkiness, with the development from the epithelia of inflammatory and pus corpuscles, and destruction of the epithelia, there is plastic exudation and often exudation of blood cells; the corpora Malpighiana become also the seat of inflammation; and, as a result of these, other changes, albuminuria and anuria, ensue. Now corrosive sublimate may produce changes very similar to, if not identical with, the above. Orfila and Christison show that the kidneys are much inflamed after poisoning by this drug, scanty and frequent micturation occurring. Taylor ('On Poisons') gives an account of several cases of poisoning by it, in which there was suppression of urine for several days. The general symptoms described are such as occur in acute croupous nephritis. The fullest accounts I have met with of its effects upon the kidneys is given by T. F. Allen ('Encyl. Mat. Med.') taken from authentic sources. Among the effects mentioned may be cited the following: 'Blackish albuminous urine; scanty urine; bloody urine; anuria for five days; ischuria. Under the microscope the urine presented granular, fatty tubuli in large numbers, showing on their surface epithelial cells of the tubuli uriniferi; also in a state of granular fatty degeneration.'"

Of the chloride of gold, Dr. Millard says: "The chloride of gold has proved of great value in chronic interstitial nephritis. Under its use I have often known the albumin to diminish and disappear. Aside from its astringent properties I can advance no theory of its beneficial action except that it may exert an influence through the medium of the spinal cord and renal nerves, experience having shown it to be a nervous stimulant and tonic of great importance.

I have found it of great value in affections of the genito-urinary system unaccompanied by inflammation, as in seminal weakness, loss of power of the sphincter of the bladder, the various degrees of impotence, etc. At all events, its usefulness in chronic nephritis has sometimes been unmistakable, and it is likely to prove still more useful if the patient suffer, as is usual, from nervous symptoms, hypochondriasis, irritability, vertigo, etc. The chloride of gold and sodium seems to produce very much the same effect as the chloride of gold simply. I administer these remedies in doses of from one-hundredth to one-tenth of a grain three or four times daily, or even oftener." Bartholow recommends this preparation in Bright's disease when there is high arterial tension. Millard's estimate of arsenic is as follows: "Arsenic (arsenious acid) is a remedy from which benefit is sometimes derived in nephritis. That it should produce some effect in nephritis is evident from its action upon the kidneys when taken in poisonous doses. It then may produce scanty, bloody, and albuminous urine, and suppression of urine. Virchow's 'Archiv.,' Bd. xxxiv., p. 213, contains the account of the case of a boy poisoned by arsenic, whose kidneys were found profoundly affected by it. "The cortical tubules were opaque and finely granular, and their epithelia could not be isolated."

"According to H. C. Wood, there is, "in arsenical poisoning, a widespread fatty degeneration of the tissues," and in another case, quoted from Dr. Saikowsky, in Virchow's "Archiv," Bd. xxxiv., p. 77, the kidneys were fatty, "their tubes choked up with fat globules, their epithelia almost completely destroyed." According to Dr. S. Weir Mitchell, the anasarca produced by repeated doses of arsenic may be preceded or accompanied by the presence of albumin and of tube-casts, as in nephritis. Certainly many of the symptoms and pathological conditions which are found in the arsenic cachexia are reproduced by nephritis. Among these may be enumerated pallor, exhaustion, anæmia, anasarca, nausea, thirst, and neuralgic pains in various parts of the body. I have found benefit from its use in only a few instances; one, a case which occurred in a young man twenty years of age of chronic croupous nephritis, the result of cold, accompanied by nausea and anasarca; the treatment consisted exclusively of Fowler's solution, five drops being given three times daily, and the administration of drachm doses of the tincture of cinchona. The

cure was complete. I have not been willing, however, to rely upon it in acute conditions, but have employed it after the subsidence of these. Homeopathic practitioners report many cases of its beneficial effects; one noticeably, in the "All. Homeopath. Zeitung," No. 68, p. 158, in which nephritis, consequent upon scarlatina, with ascites, hydrothorax, œdema pulmonum, scanty, bloody, and albuminous urine, was cured by it."

Iodide of potassium he believes is only useful in syphilitic cases, and in full doses, twenty to sixty grains a day.

Pilocarpine is useful in doses of one-twentieth to one-fourth of a grain, repeated until copious diaphoresis and salivation appears. It has been found of great value in dropsy with threatened œdema of the lungs and glottis and in uræmic convulsions. "Dr. Horrocks ('Lancet,' June 13, 1885) gives an account of a case of puerperal convulsions from albuminuria occurring in Guy's Hospital, successfully treated by pilocarpine; the patient being a healthy primipara. When seven months pregnant very severe convulsions set in, occurring every fifteen minutes, and lasting three to ten minutes. Complete anuria, ice bags, and purgatives were employed; face, body, and legs highly œdematous. The patient having been for a number of hours unconscious, the subcutaneous injection of the hydrochlorate of pilocarpine was employed three times, the dose varying from one-fourth to one-third of a grain. Each was followed by profuse sweating; temperature was lowered, convulsions ceased, and urine secreted, at first highly albuminous. The child was born dead. Mother's recovery was perfect. No depression occurred from the use of the drug, though Dr. Fordyce Barker has found this an objection to it."

Hydrate of chloral has been found useful in uræmic convulsions. The dose is from ten to thirty grains. If it cannot be given by the mouth, use it in suppositories.

In a paper read before the International Congress at Atlantic City (1891), Dr. Oscar Hansen presented the following hints respecting the homeopathic treatment of Bright's disease. "The most important remedies," he said, "are: oleum terebinthinum, arsenicum, phosphorus, acidum phosphoricum, calcarea phos., cuprum arsenicosum, plumbum, and aurum muriaticum. Of these the symptoms of terebinthina correspond most closely with the acute form, viz., small secretion of urine; the urine dark and bloody; the micro-

scope shows casts and oxalate of lime; the patient is pale, the skin is yellowish, and suffering marked. (If there is organic disease of the heart, this remedy is contraindicated.) Watery mucous diarrhœa, nausea, vomiting, and thirst. Arsenicum and its combinations are recommended when the heart is attacked. The cardiac lesion is nearly always aortic. Arsenicum is also an important medicine for emphysema pulmonum. Kafka uses chininum arsenicosum when arsenicum fails to act. Hansen has tried this, but has failed to obtain any beneficial result."

"Among the preparations of arsenicum, Buchner particularly mentions kali arsenicosum, and says that arsenicum and its preparations produce Bright's disease after having produced hypertrophy of the left heart. When they cease with the medicine, the kidney disease will stop first, and thereafter the disease of the heart (experiment with rabbits). The urine contains albumin. Symptoms for arsenicum: Emaciation, loss of power, weakening, œdema over the whole body, dropsy. The skin dry, parchment-like; the color pale-yellowish, sleepiness, the members icy cold, the pulse feeble, scarcely perceptible. Blindness, forgetfulness, fright, particularly in the night, with fear of death. Giddiness with mist before the eyes. Ardent and inextinguishable thirst. Drinks often, but little. No appetite. Vomiting of all that has been taken. Cardialgia, with burning pains. Diminution of the quantity of urine. Short, frequent and anxious breath. Is obliged to sit up on account of asthma. Suffocation. Palpitation of the heart with fear. In the urine are found fatty and waxy casts.

"Phosphorus is one of the most important remedies. The urine of a phosphorus patient contains pus, mucus, epithelium, and in some cases albumin. In a man who died of poisoning by phosphorus, the urinary canals were found filled with casts; the urine contained albumin and casts; the specific gravity was high; and there was a smaller quantity of chlorides than in the healthy.

"Buchner says that arsenic operates on the left heart, phosphorus on the right. For pneumonia, joined with Bright's disease, phosphorus is the most important. If there are symptoms of œdema of the brain, arsenic is the best; when there is atrophy of the brain, phosphorus. Phosphorus is also indicated when Bright's disease is secondary to suppuration, particularly caries. If, during Bright's dis-

ease, diarrhœa occurs without pain, phosphorus may be commended as well as china. Among the symptoms of phosphorus in regard to Bright's disease, are: Lassitude in the whole body, hands and feet icy, sleepiness. The fatigue is greatest in the morning. Heat in the body without thirst, particularly in the evening; indisposed to work, giddiness, forgetfulness, heavy headache, particularly in the forehead; œdema of the upper lids, mist before the eyes, complexion pale yellowish-gray, sickly, œdema in the face; want of appetite; pressure and burning in the stomach; diarrhœa without pain, but weakening and light. Frequent passing water in the night, but a small quantity at a time. The urine aqueous and light-colored. Serous expectoration from the lungs is an important sign for phosphorus; fear and anxiety. Asthma. Œdema about the ankles. If there is a tuberculous base, phosphorus is important; likewise when there is a weakening of the heart."

With regard to the following remedies, Hansen has no experience. Buchner mentions calcarea phosphorica, and arsenicosa. They are particularly for persons who have brought the illness on themselves by working in water. "Calcarea arsenicosa for the young girl with amennorrhœa, and also ferrum and its combinations. Cuprum aceticum operates on the left heart as does arsenic, and can be employed in the last stage of Bright's disease, because it produces atrophy of the kidneys."

Aurum muriaticum is particularly useful in Bright's disease resulting from long suppurations, or bone diseases and mercurial poisonings.

Digitalis, and particularly digitaline, is recommended by Bæhr in the later phases of the illness, when there is bronchitis with serous expectoration. The symptoms are: Irregular, small, and scarcely perceptible pulse; frequent desire to urinate in small quantities; œdema; hands and feet cold; damp perspiration during the night; and fearfulness.

"In Bright's disease with scarlet fever, the principal remedies are: Apis, hellebore, hepar sulphur, and sepia. Apis is good so long as the œdema is small; hellebore as long as there is albumin without casts, and sepia likewise. As soon as there are casts, hepar sulphur and arsenicum, and if a complication with the lungs is joined, phosphorus. Buchner says, that when an epidemic shows a

tendency to Bright's disease, then arsenic is most important. In Bright's disease from renal calculi he recommends bryonia."

Dr. Hansen gives in the above a brief *resumé* of Buchner's treatment. But I repeat what I have asserted above that Buchner's treatment is misleading and difficult of comprehension. His pathology is antiquated and not up to the present date. Dr. J. H. McClelland's article on Bright's disease in Arndt's "System of Medicine" is fully abreast of the time. Its pathology is complete. He has gathered from our literature all the treatment of any value and much that is valueless. The greatest fault to be found with Buchner and McClelland is that they do not treat separately of acute and chronic nephritis.

PYELITIS.

Definition.— An inflammation of the pelvis of the kidney. It is a suppurative inflammation without distension of that cavity.

Pyonephrosis is the same disease with accumulation of pus with distension, as the mechanical result of some obstruction. When the inflammation has become chronic there is obstruction of the ureter; the renal pelvis is distended with pus, and the renal substance liquified and destroyed; or the liquid being absorbed, only a chalky or putty-like material is left.

Causes.— Irritation of calculi, tubercle, typhoid fever, pneumonia, scarlet fever, diphtheria, small pox, and other fevers.

In these infectious fevers, an acute inflammation of the pelvis of the kidney may occur, sometimes hemorrhagic in character, more frequently diphtheritic. The presence of decomposing urine, following the pressure on the ureter by tumors or bladder disease, is by far the most frequent cause of cystitis. In these cases the inflammation may not be confined to the pelvis, but pass to the kidney, causing pyonephrosis. Occasional causes are cancer, hydatids, the ova of parasites, and the saccharine urine of diabetes. There are certain drugs, like turpentine, cubebs, copaiva, and other renal irritants, which may cause purulent inflammation.

Morbid Anatomy.— In the early stages of this disease the mucous membrane is turbid, somewhat swollen, and may show ecchymoses. The urine in the pelvis is cloudy, and on examination numbers of epitheleal cells are seen. If caused by infectious fevers there is

usually a grayish pseudo-membrane, limited, or covering the whole surface of the pelvis.

The pyelitis consecutive to cystitis is usually bilateral and the kidney is apt to be involved — causing acute suppurative nephritis.

Symptoms.— In mild grades there are few symptoms — merely pain in the back, or tenderness on deep pressure on the affected side. The urine is turbid, contains a few mucus and pus cells and occasionally blood corpuscles. The urine is acid and there may be a trace of albumin. Before the condition of pyuria (discharge of pus) is established there may be attacks of pain in the affected side, not as severe as renal colic, but with rigors, high fever, and sweats. Then the urine, which may have been clear, becomes turbid or smoky from the presence of blood, and contains large numbers of mucus cells. When the pyelitis, whether calculous or tuberculous, has become chronic and suppurative, we then have discharge of pus in variable amount, sometimes intermittent. When only one kidney is involved the ureter may be temporarily blocked, normal urine is passed for a time, and then there is a sudden outflow of pent-up pus, and the urine becomes purulent. When this retention occurs, careful examination may show a tumor on the side affected. The pus has the ordinary characteristics, but portions of kidney tissue may be mixed with it. Casts from the tubules may sometimes be present. The urine is at first acid, and may remain so even when pus exists in large quantities, but if it remains any time in the bladder, or if cystitis exists, it becomes ammoniacal. Micturition may be very frequent, and much irritability of the bladder be present. In suppurative pyelitis an intermitent fever is usually present. The chills may occur at regular intervals and the case is often mistaken for malaria. Ultimately the fever assumes a hectic type. There is more or less anæmia, with progressive wasting and general failure of health. Secondary abscesses may develop, with the symptoms of pyæmia. Tubercular pyelitis may simulate typhoid fever. Physical examination shows tenderness of the affected side, and in pyonephritis enormous swelling of the affected side.

Nervous symptoms, such as dyspnœa, convulsions, and coma may appear — not unlike those in diabetes.

Diagnosis. — Tuberculous pyelitis can be ascertained by the presence of the bacilli in the urine.

Calculus pyelitis may show the disintegrated stone in the pus, as I have observed in several cases. In perinephritic abscess the urine may be free from pus. Suppurative pyelitis and cystitis are frequently confounded. The two conditions may coexist. But the acid character of the pus, the less frequent occurrence of ammoniacal decomposition, the local signs in one lumbar region, and the absence of pain in the bladder, should be sufficient to differentiate the disease.

Prognosis.— Simple catarrhal pyelitis, or those cases appearing during fevers usually recover, but when occurring from diphtheria, cholera, or tuberculosis the prognosis is grave. Calculus pyelitis usually ends favorably if the stone can be dissolved or removed by an operation. When it is associated with grave vesical disorders, the prognosis is doubtful, generally bad.

When pyonephrosis develops the dangers are increased; perforation may occur, or the patient may be worn out with hectic fever.

Treatment.— Simple acute pyelitis should be treated with absolute rest and warmth in bed, with plenty of bland diluent drinks, hot hip-baths, hot-water bottles or poultices to the loins. Alkaline waters, such as Vichy and Carlsbad, or similar ones found in this country. No "hard" water should be drunk. It has been the custom to give warm or cool infusions of slippery elm, marsh-mallows, and other mucilaginous beverages in inflammation of the urinary passages, but it is not certain if any mucilage ever reaches those organs — probably not. But it is certain that infusions of triticum repens, corn-silk, galium, and a few others having a sedative actien on the urinary tract, are of decided value in this disease.

Before the discharge of pus sets in, cantharis, cannabis, turpentine, eucalyptus, mitchella, tussilago, plantago, and all the renal irritants are useful in minute doses, not lower than the 2x, or a weak infusion.

Mercurius seems to have a decided curative influence when given in small doses. Mercurius corrosive 6x is the most curative preparation.

As soon as pus appears, or mucus mixed with pus, and the acute inflammation subsides, the best remedies are turpentine, juniper, sabina, thuja, cubebs, copaiva, sandal-wood, kava kava (piper methis-

ticum), barosma (buchu), eucalyptus, hepar sulphur, mercurius, chimaphila, petroleum, benzoic acid, berberis, pichi, etc.

Those which have been most useful in my practice are eucalyptus, oil of sandal-wood, chimaphila, turpentine, and copaiva. I prefer the lowest dilutions, and in some torpid, chronic cases, small doses of the tincture or pure oil.

In calculus pyelitis I have had good results from thapsi bursa pastoris, lycopodium, uvi ursi, epigæa; and lithium in uric acid calculi. The lithia waters are also good adjuvants. When the calculi are composed of lime or phosphate salts the best remedy is the boro-citrate of magnesium. In two severe cases it effected a cure, given in doses of from three to five grains four times a day. Whatever may be the cause of the pyelitis, with or without cystitis, the painful irritability of the urinary passages is complained of more than any other symptom. For this irritability there are two classes of medicines which possess a positive sedative influence, aside from their homeopathicity. They are: (1) belladonna and hyoscyamus, and their alkaloids, atropine and hyoscyamine. The former should be prescribed in doses of one to five drops of the mother tincture or 1x; atropine and hyoscyamine in doses of two to five grains of the 3x trituration. (2) Barosma, epigæa, kava kava, corn-silk, triticum repens, and mitchella. These have the best effect when given in decoction (four drachms of the crude substance to a pint of water), a wineglassful (two ounces) every two or three hours. The sedative dose of the tincture ranges from five to ten drops, which should be repeated every two or three hours.

URÆMIA.

Definition. — A series of manifestations developing during the course of Bright's disease, due to the retention within the blood of poisonous materials which should be eliminated in the urine or by the bowels. These manifestations are chiefly nervous. This condition, though usually seen in nephritis, may occur when the ureters are obstructed, or when the circulation of the blood in the kidneys is impeded.

There is much dispute as to the nature of the poisons causing this condition. It was once supposed that the chief poison was

urea, but this has not been fully proven. It has been supposed that carbonate of ammonia was the cause. Dr. Grainger Stewart says that many cases of uræmia are due to alterations of the circulation and of nutrition of the cortical substance of the brain. There may be hemorrhages and degenerative changes. Uræmia has occurred in the apparently healthy, but a post-mortem examination in such cases has disclosed serious renal changes. Diabetic coma is not the same as uræmic coma. Smitz, of Berlin, recognizes two causes of the former: (1) weakness of the heart's action, brought about by the effect of sugar on the muscular fibres of the heart; and (2) an acute self-poisoning, which has been wrongly termed acetonæmia.

Traube suggested that uræmia, when characterized by coma and convulsion was due to localized œdema of the brain, for the uræmia may occur when the urine is profuse.

Symptoms.—French writers divide these into cerebral, dyspnœic, and gastro-intestinal. The cerebral manifestations are mania, delusional insanity, convulsions, coma, local palsies, occipital headache, numbness, cramps, etc.

Uræmic dyspnœa is classified as continuous, paroxysmal, and with Cheyne-Stokes breathing.

Gastro-intestinal manifestations often set in with abruptness. Uncontrolable vomiting may occur, which persists until death.

Dr. Barie describes a special uræmic stomatitis in which the mucosa of the lips, gums, and tongue are swollen and erythematous; with salivation, dysphagia, foul tongue, and offensive breath.

Diagnosis.—Uræmia may be confounded with cerebral lesions, hemorrhage, meningitis, and brain tumors. Apoplexy occurring in kidney disease, with stiff arteries and sudden loss of consciousness, may simulate uræmia. Uræmia may persist for weeks and months, the patient lying in a state of torpor and unconsciousness. This may be confounded with the coma of infectious fevers and typhoid. Uræmia may also be confounded with poisoning by opium or alcohol.

Treatment. — The old-school treatment to a certain extent is rational and valuable. Copious diaphoresis is a valuable means of ridding the blood of noxious substances. Purgation in some cases is highly beneficial. The use of sulphate of magnesium, bitartrate of potassium, elaterium, croton oil, etc., should be used until the bowels are thoroughly evacuated. Diuretics are useful. Apocynum,

hellebore, strophanthus, sparteine, and digitalis are the most valuable. With the diuretics, copious draughts of water should be swallowed by the patient if possible. If water is not taken there is danger of too great concentration of the blood. Extreme hydrogogue purging has aggravated the uræmia. Dr. Smitz's suggestion of giving castor oil freely has given better results, especially in diabetic coma, than any other purgative. He is of the opinion that the poison lies in the bowels. With the action of the oil, resulting in copious, black, foul stools, recovery takes place. Of eight cases, four treated with castor oil recovered; and four who had no oil died. He gives castor oil even if there is diarrhœa. The dose is one-half to one ounce repeated every two hours. I have verified its value in several cases. Glonoine should be given, if there is great arterial tension, until it is reduced. A drop or two of the 1c dilution should be given every two hours. Pilocarpine, in doses of one-eighth or one-fifteenth of a grain, by the mouth or hypodermatically until copious sweating occurs, has saved many cases.

Buchner recommends cuprum when there are convulsions; arsenic when there is œdema of the brain; phosphorus when there is atrophy of the brain, also hydrocyanic acid and nicotine.

Dr. J. H. McClelland, in Arndt's "Practice," recommends many drugs, among them apis, crotalus, zincum, opium, etc.; but in my opinion most of them are valueless, because they do not eliminate the poisons, or antidote them. No matter how closely a drug may imitate the symptoms of uræmia due to Bright's disease or diabetes, it will not be a curative remedy. In the toxæmia of fæcal retention when there is coma, delirium, convulsions, etc., the remedy which closely resembles these symptoms will not relieve or remove the symptoms. This failure is because they do not remove the source of the toxines. But if we clear out the intestinal tube by means of thorough evacuants, all the symptoms quickly disappear.

ACUTE CYSTITIS.

Acute inflammation of the bladder may be divided into three varieties, namely: inflammation of the mucous membrane, of the muscular walls, and of the peritoneal coat.

Inflammation of the mucous membrane may be catarrhal, croup-

ous, or diphtheritic. In nearly all cases of acute inflammation of the mucosa, the inflammation extends to the sub-serous cellular tissue, and even to the muscular and peritoneal tissue.

Causes. — The idiopathic form is rare. Rheumatic and gouty cystitis is commoner than is supposed. Exposure to cold and dampness, as where the whole body is suddenly chilled when wet, or sitting on a cold, damp surface, has been known to cause cystitis.

It may be caused by an extension of disease from the urethra, kidneys, or some pelvic organ. Direct irritation, by instruments, chemical injections, external violence, drugs, calculi, and alkaline decomposition of the urine may cause cystitis.

Symptoms. — Coulson ("Diseases of the Bladder") gives the following truthful and graphic definition of acute cystitis:

"Unless it supervenes on the chronic form, acute inflammation of the bladder generally commences in a sudden manner, and runs a rapid course. The patient first experiences some pain in the region of the bladder; this is quickly followed by frequent and irresistible desire to make water, which is voided at short intervals, and in small quantities; these two symptoms rapidly increase until they acquire a most distressing degree of intensity. The pain is first experienced above the pubes, and may be dull for a short time; but it soon becomes violent and extends along the urethra, shooting into the perineum and down the thighs. Pressure over the pubes or on the perineum greatly increases the pain, and if the posterior wall of the bladder be examined by introducing the finger into the rectum, it will be found that this part of the organ also is extremely sensitive. The slightest movement of the body increases the pain; the patient lies with the limbs drawn up, so as to relax the abdominal and pelvic muscles. As the disease advances, the discharge of urine takes place very frequently, for the desire to make water becomes more and more urgent, there is a sense of heat and burning along the urethra, and the pain felt in passing a few drops of urine is often compared by the patient to the passing of molten lead. At the early stage, the pain subsides after the urine has ceased to flow, but it returns as soon as a small quantity of fluid collects in the bladder. The mucous membrane, in fact, soon becomes altogether intolerant of the contact of the urine; and the agony thus produced, together with the incessant and irresistible call to evacuate the organ, are valuable diagnos-

tic signs of acute inflammation. The irritability of the bladder is communicated to the rectum, and tenesmus is, consequently, a frequent symptom.

"The condition of the urine varies with the stage of the disease; it is at first mucus, then tinged with blood during the height of the disease, and, in many cases, purulent towards the end. These conditions will be subsequently referred to.

"Whenever the inflammation is severe, and occupies any considerable portion of the mucous membrane, constitutional symptoms, as might be expected, quickly set in. Rigors occur, and symptomatic fever is developed, severe in degree, but often of a nervous character and attended by great disturbance of the digestive organs. Hence, vomiting frequently occurs, and the patient is a prey to nervous symptoms of a very distressing nature. After a few days, unless the disease be arrested, the local symptoms acquire an extraordinary degree of severity; the pain is constant and of a most distressing kind, being accompanied by incessant but unavailing efforts to empty the bladder; the urine comes away in drops, and the bladder gradually loses its expulsive power, though aided by violent contraction of the abdominal muscles. A firm, painful tumor may now often be felt above the pubes, for retention is succeeding the incontinence produced by irritation; the sufferings of the patient, carried to their highest pitch, may appear to subside a little; but this is deceptive; the character of the fever changes; the countenance becomes anxious, and delirium sets in; there is often hiccough; the pulse becomes weak, irregular, and then intermitting; the skin is covered with a clammy perspiration; and the patient finally sinks about the eighth or tenth day into a state of prostration or absolute coma."

Acute cystitis is a very serious disease, and requires the most cautious and judicious treatment, for often, if the patient recovers, the results of the inflammation are serious and render life almost insupportable. It is very rare that chronic inflammation does not follow.

Treatment.— As soon as we are satisfied that inflammation is impending, the patient should be given gelsemium (tincture) and cantharis 2x at frequent intervals. As any irritating matter in the lower bowel greatly aggravates cystitis, the rectum and colon should

be thoroughly emptied by Epsom salts, bitartrate of potassium, or a colon douche of warm water. Then the patient should be given a hot hip-bath, for ten or fifteen minutes, and hot flax-seed poultices, containing aconite or hamamelis, kept constantly applied. Absolute rest in the recumbent position is essential. In many cases sitting or standing aggravates the pain. The diet should consist of farinaceous gruels or milk mixed in equal proportions with Vichy or seltzer water. These should be taken in limited quantities. If too much is taken the quantity of urine is increased, and consequently there is more distension of the bladder and more frequent calls to urinate. M. Civiale asserts if we could keep the organ in perfect repose we could soon subdue the inflammation.

He advises frequent use of the catheter, but, as Coulson observes: "This is excellent advice and should be followed whenever symptoms of retention of urine appear; but the pain and irritation pro duced by the passage of any instrument along the urethra is so severe that it would be inadvisable to employ the catheter with the sole object of keeping the bladder empty."

The young and inexperienced physician is too prone to use the catheter on all occasions, but it is a procedure that is productive of more injury than benefit in the great majority of cases. Only when the bladder is abnormally distended should it be used, and when used it should be lubricated with a three per cent cocaine solution in olive oil.

The medicinal treatment should be gnided by the law of similars, and the use of necessary palliatives. When the mucous membrane is the principal seat of inflammation, those drugs which cause inflammation of the mucosa are the remedies. The subjective symptoms of a drug should not be our only guide. We must know that they are capable of causing cystitis. Many drugs have the symptoms of cystitis but they are due to the irritant action of the drug on the nerves or muscles of the bladder without causing inflammation. The two most important remedies are cantharides and turpentine. Nearly all the symptoms of any case of cystitis can be found in their pathogeneses. The next in value are copaiva, cubebs, oil of sandal-wood, erigeron, pichi, senecio, and other powerful resins or oleo-resins. These cause acute mucous cystitis, with mucus and muco-purulent discharge from the inflamed membrane. Cantharis and the cyanide

of mercury cause croupous inflammation, but this form is rarely met with, except after scarlet fever. When the muscular coat is inflamed, gelsemium, belladonna, hyoscyamus, bryonia, cimicifuga, and viburnum are indicated. Coulson admits that it may be difficult to distinguish between inflammation of the mucosa and that of the muscular coat, but he says:

"When the muscular coat is chiefly involved it generally happens that the power of passing urine does not exist, and the desire to void urine is less frequent, as it is not experienced until a good deal of urine is accumulated in the bladder, and then comes on in violent paroxysms. Neither is there the burning sensations along the urethra which is felt when the mucous membrane alone is affected."

Two of the best palliatives of the agonizing pain in cystitis are corn-silk (stigmata maidis) and hydrangea in doses of ten to twenty drops of the tincture every hour or two.

In some cases we are obliged to use a hypodermic injection of morphine to relieve the terrible pain, or when using a catheter; cannabis indica, eucalyptus, piper methisticum, pulsatilla, apis, equisetum, and aconite are sometime indicated in acute cases. Phenacetin often controls the pain and spasm better than any other anodyne. It is particularly useful in those cases in which la grippe attacks the bladder and causes, if not actual inflammation, symptoms closely imitating it. In some instances it is combined or alternated with salol with excellent results. Phenacetin controls the pain, while salol prevents putrefaction or fermentative changes in the urine. Tablets containing two and one-half grains of each may be repeated every hour, but I have not hesitated to give a full dose of ten or fifteen grains of phenacetin in severe cases, repeating it every six hours.

CHRONIC CYSTITIS (CATARRH OF THE BLADDER).

Chronic inflammation of the mucous membrane of the bladder may arise from an acute attack or come on slowly and insidiously.

Coulson ("Diseases of the Bladder") gives the best description of any author. He says: "This is a frequent disease, and in many respects worthy of serious attention. It may arise from a great variety of causes, and presents itself in different degrees of intensity. The disease may succeed acute inflammation of the mucous

membrane. In such cases it is sometimes accompanied by ulceration, and constitutes a dangerous affection; but, generally speaking, the inflammation is subacute or chronic from the commencement, and is characterized by an abundant discharge of mucus with the urine, whence the term vesical catarrh. The disease is rarely, if ever, an independent affection of the mucous membrane. In almost every case which comes under the notice of the surgeon, he will, on due examination and inquiry, be able to trace the origin of the catarrh to some coexisting malady, or to the forced retention of urine, such retention being due either to some obstruction to the natural flow of urine, or to atony of the coats of the bladder.

"The most common exciting causes, therefore, are stricture, stone, and enlargement of the prostate; after these come exposure to cold, indulgence in ardent spirits, diuretic and irritating remedies such as cantharides, violent exercise on horseback, and venereal excesses; the disease also exists as a symptom in connection with many organic diseases of the rectum. In cases of injury and diseases of the spine, this state of the bladder is by no means infrequent. Men are more subject to this complaint than women, and elderly persons more so than the young. It would appear to be uncommon in certain countries; while in others it occurs more frequently, and, according to some authors, occasionally assumes an epidemic character. The disease prevails in this form in Egypt, and is due to the presence of a parasite, the Bilharzia hæmatobia. Gouty persons are very subject to this affection. The symptoms of the disease may be divided into two classes: those which belong to the inflammatory element, and those connected with the state of the urine, the chief of which latter class is the presence of vesical mucus in superabundant quantity. The inflammation itself seldom gives rise to any general symptoms, as fever, etc., while the local signs are not very well marked, except in old-standing and severe cases, in which the inflammation may assume at intervals a subacute character. In many cases the symptoms are mild, and the patient experiences little inconvenience; there is no pain in the region of the bladder; but the urine is voided more frequently than is natural, and the passage of that fluid is accompanied by a sensation of heat which extends along the urethra or shooting pain towards the anus, with a sense of weight in the perineum."

"Cases of this character have been observed to terminate in a short time, or to assume an intermittent form, especially when associated with hemorrhoids, or certain petechial affections; but the duration of the complaint is uncertain. Old persons mostly retain it as long as they live.

"At other times the disease assumes a serious character and may prove fatal, especially in old and weak persons. The obstinacy and danger of the complaint mainly depend on the causes which have produced the inflammation and upon the extent to which the kidneys are involved.

"In these severer cases the functions of the urinary apparatus are seriously impeded. The bladder is never emptied in a complete manner. The expulsion of the urine, and particularly of the last few ounces, is more or less painful, according to the violence with which the abdominal muscles and bladder contract. The sense of heat in the bladder and urethra is converted into scalding; the desire to make water becomes more frequent, and is attended by violent straining efforts; and retention sometimes takes place from obstruction of the urethra by clots of inspissated mucus.

"These symptoms are relieved by drawing off the urine with the catheter; but they return as the organ becomes filled with fluid. The patient is very restless and uneasy, and complains of thirst; the bowels are irregular, either constipated or relaxed; there exists pain at the extremity of the penis, around the anus, and in the region of the loins. Great prostration of strength and wasting of flesh are present. The condition of the urine varies with the duration of the symptoms and the causes which have produced the disease. In slight and recent cases of chronic catarrh the urine is more or less turbid, and contains the same cellular elements as are found in the acute form, viz., mucus, epithelium, and pus corpuscles, together with an amount of albumen corresponding to the quantity of pus. The reaction of the fluid is acid or feebly alkaline, and, after the urine has been standing for some hours, the cellular elements form a more or less copious, loose deposit at the bottom of the glass. In more severe cases, and as the disease advances, the changes in the urine become more manifest, while still in the bladder the urea undergoes conversion into carbonate of ammonia; the urine therefore becomes decidedly alkaline in reaction, and emits an ammoniacal and offensive odor.

Various theories have been advanced to explain this metamorphosis of the urea. It was formerly supposed that the mucus secreted by the inflamed membrane acted as a ferment, but the more recent view is that the presence of a peculiar ferment or excitant of putrefaction (either in the form of organized bodies, such as bacteria, or of a non-organized material, such as a particle of putrid matter) is a necessary condition for the change in question. The fact, alluded to by Niemeyer, that the decomposed and altered state of the urine has been known to follow the introduction into the bladder of a dirty catheter, appears to indicate that something more than vesical mucus is required to produce the change. Dr. Owen Rees has suggested that alkalinity of the urine may be sometimes due to the secretion of an alkaline mucus by the vesical mucous membrane; but Dr. Roberts, having had under observation a patient with extroversion of the bladder, was not able to satisfy himself that the alkalinity of the exposed mucous membrane was not owing to the blood-serum, which oozed from the raw surface, rather than to any mucous secretion which might be yielded by an inflamed mucous membrane.

"When the ammoniacal decomposition has fairly set in, other changes also take place in the urine. It becomes muddy, and often more or less dark from the presence of the granular pigment-matter of disintegrated blood-corpuscles; the purulent deposit becomes more copious, and the pus corpuscles cohere into a gelatinous tenacious mass, which has occasionally been found so glutinous that on pouring it from one vessel to another it was drawn out about a foot in length without rending. Enormous quantities of this deposit are sometimes passed in the course of twenty-four hours, and it contains, in addition to cellular elements, the ammoniaco-magnesium phosphate, phosphate of lime, and bacteria. When there is ulceration of the mucous membrane, red blood-corpuscles will also be found. When this glutinous deposit comes away in large quantities, it is discharged with effort and may occasion retention of urine. After micturition, the burning sensation in the region of the bladder ceases, but gradually returns as the mucus again collects. If the secretion be very copious, symptoms of hectic may supervene and the patient dies from exhaustion.

"Chronic cystitis may last for several years, the symptoms varying in urgency from time to time. When the urine has become

decidedly ammoniacal, another cause of irritation is added to those which already exist. The acrid fluid irritates the mucous membrane and induces fresh inflammation; the purulent secretion becomes augmented and promotes the decomposition. There are, therefore, two sources of mischief, each tending to aggravate and perpetuate the other, and thus it happens that a case of chronic cystitis, if left to itself, invariably goes from bad to worse. Ulceration of the mucous membrane is not an infrequent consequence, and when that occurs the local symptoms become more marked. When the disease is about to terminate in death, the patient usually falls into a low febrile state; the tongue becomes dry and the stomach irritable; prostration increases, and death is ushered in by delirium and coma. Various views have obtained from time to time with regard to the causation of these symptoms, and some have attributed them to the absorption into the blood of the carbonate of ammonia. Rosenstein, however, found that the injection of this substance into the veins of animals always excited violent muscular convulsions, a symptom which, though characteristic of uræmia, is not present in the cases under consideration. He attributes the final symptoms of this so-called 'urinous fever' to the presence of bacteria in the blood.

"The morbid appearances found after death are those of chronic inflammation. In the commencement, they are usually confined to the neck and posterior part of the bladder; the mucous membrane, usually pale, becomes dotted and streaked with blood, which in part is contained in dilated blood-vessels, and in part is extravasated. These spots are generally black, the blood having lost its normal color. As the disease advances, the discoloration becomes deeper and more general; the membrane is thickened, softened, and flocculent; it tears readily from the muscular coat, and is found abraded, especially in the neighborhood of some large extravasation. The surface is covered with a muco-purulent layer, and the contained urine is dark-colored, turbid, and strongly ammoniacal. In a few cases of old-standing the mucous surface is pale, and its appearance would never lead us to infer the existence of inflammation in any degree. If the disease has spread along the mucous lining of the ureters to the tubular structure of the kidneys, those canals will appear filled with a muco-purulent fluid, and the kidneys will pre-

sent the appearances characteristic of pyelitis. The walls of the bladder become thickened from effusion into its cellular tissue; ulceration often takes place in the mucous membrane, which, as in acute inflammation, may be entirely removed, leaving exposed the hypertrophied muscular fibres. Ulceration, however, is more frequently observed whenever, from some occasional cause, the inflammation assumes an acute character. Perforation of the bladder, with suppurative peritonitis, may be found as a consequence of the ulceration. The most prominent portions of these muscular columns are usually of a bluish-red or purplish color; while between them, the membrane is pale, swollen, soft, and offers little resistance; occasionally small ulcerations are found. But what is very remarkable, between the hypertrophied columns, pouches or sacs generally coexist with dilated ureters, both states being produced by the same physical cause. These pouches often contain calculous concretions."

"In extreme cases of this kind, the secreting structure of the kidney becomes reduced to a thin layer, covering the widely dilated pelvis and infundibula. The ureters, in such instances, are both dilated and tortuous, and the lining membrane is rough and granular, and in some instances is covered by flakes of lymph.

"In cases where the obstacle to the escape of urine has existed for a considerable period the walls of the bladder, and particularly the muscular coat, will be found enormously hypertrophied, and such hypertrophy may be either concentric or eccentric. In the former case the capacity of the organ may be much diminished, but in eccentric hypertrophy, which is much more common, the bladder may be so much dilated as to contain several pints of urine and to reach as high as the umbilicus. In addition to the morbid appearances presented by the bladder itself, those of the various conditions upon which the disease depends will also be found. Among those may be mentioned strictures of the urethra, prostatic enlargement, calculi, etc.

"It has been said that when the vesical mucus is passed in small quantity, the disorder may be mistaken for an involuntary discharge of semen, which accompanies in some persons the escape of the urine and fæces. These two fluids are somewhat analogous in their appearance, but may easily be distinguished by the aid of the microscope. The urine

in this disorder may also be distinguished from chylous urine, because the latter, immediately it is passed, presents a whitish milky appearance or opaline tint, due to the presence of fatty matter which forms a creamy layer on the surface after the urine has stood for some hours; on the contrary, the urine in vesical catarrh is at first turbid; on standing the sediment becomes viscid, ropy, and flocculent, or united into one clot."

"Chronic inflammation of the bladder connected with disease of the prostate or even with lesions seated about the neck of the organ, is always more severe and difficult of cure than when dependent on stricture of the urethra. The difference between the exciting causes readily accounts for this difference in the affection which they produce. It is slow and insidious in its progress, and is liable to vary much in intensity at different periods of the disease. A careful examination of the bladder will alone enable the surgeon to ascertain the particular nature of the coexisting lesion, and determine the method of treatment required for it."

Treatment.— The diet in catarrh of the bladder should consist of those foods which do not impart irritant quantities to the urine or increase its acidity, if too acid, which is rare, or increase its alkalinity. Extreme alkalinity is the rule. After removing any mechanical cause which may exist, we must select medicinal remedies which, when taken to excess, will cause a similar condition. This is an axiom that no school can dispute; for all advise in the strongest language the very drugs which will cause cystitis, acute and chronic, *e. g.*, Coulson advises copaiva, cubebs, buchu, and turpentine.

Sir Astley Cooper says: "The best remedy that can possibly be taken is the balsam of copaiva: no medicine so completely robs the urine of its mucus as this." He might have added that no medicine so certainly causes acute and chronic catarrh of the bladder. His dose is moderate, "eight or ten drops three times a day."

The oleo-resins, then, are the chief remedies for this disorder. When taken into the circulation they are eliminated through the kidneys, and it is their actual contact with the diseased mucous surfaces which cures the morbid condition. In fact, it is my opinion that all drugs which cause and cure catarrhal diseases act in this manner, and not by any supposed dynamic influence through the

nerves. Medicines which cause and cure painful affections of the bladder may, however, act through the nerves which supply that viscus. The chief remedies for catarrh of the bladder are abies, buchu, cantharis, cannabis, cubebs, chimaphila, erigeron, eucalyptus, corn-silk, kava kava, populus, pulsatilla, grindelia, pinus canadensis, thuja, turpentine, uva ursi, baldo, pichi, salol, and phenacetin.

Of these, my experience has been mainly with buchu, chimaphila, eucalyptus, cubebs, kava kava, corn-silk, turpentine, and pichi. As a rule I give one of these in alternation or combination with some medicine indicated for the pain. If cubebs is indicated by the tenacious, stringy mucus, and hyoscyamus by the spasmodic pain, I prescribe them together. No medicine has been so serviceable for me in cases remarkable for the great amount of muco-purulent discharge, and the absence of pain, as chimaphila. Such cases occur principally in women. I have cured cases where the mucus sediment was fifty per cent. The drug was given in the fluid extract (which is better than the tincture), fifteen to twenty drops every three or four hours.

Eucalyptus is a splendid remedy. The urine is scanty and foul-smelling, and the muco-purulent sediment large. There is burning when urinating, with fever and general malaise. It is even useful when there is "urinary fever" (which is really a septicæmia), with chills in the afternoon, hectic and night sweats.

Copaiva is most suitable when the disease is consequent on a gonorrhœa. The mucous is yellow and creamy and there is much vesical tenesmus. Thuja also for similar conditions, and especially when the prostate is enlarged. If these two last medicines fail, try kava (piper methisticum), which has been found very useful in such cases. Uva ursi is indicated when there is a great inertia of the bladder and it fails to expel all the mucus. It is said to act on the bladder as ergot does on the uterus. (Nux vomica acts similarly on the bladder.)

Salol is a medicine of the greatest importance. It is a sedative to the mucous surface, disinfectant to the contents of the bladder, and curative to the catarrhal process perhaps more promptly than any other drug. It can be alternated with corn-silk, hydrangea, phenacetin, or belladonna, if the pain is intense and the bladder very irritable.

The antisepsis of the renal passages by the use of salol in the intestinal tube is a method of decided value. As a consequence of the action of the pancreatic juice, salol splits up into carbolic and salicylic acids, which are then eliminated by the kidneys, carbolic acid being unchanged salicylic acid after it has combined with sodium. Investigations by Nencki, Sahli, and Lepine have proved the truth of this statement beyond contradiction, and these writers have as a consequence, recommended its use for "internal disinfection" in cholera, typhoid fever, and other bacterial diseases. Dr. Dreyfuss ("Wiener Medicinische Blætter," December 19, 1889), bearing these facts in mind, has recommended its use internally as a means of inducing the passage of an antiseptic fluid through the kidneys, ureters, bladder, and urethra, and claims that it acts in a much more intensive manner and covers a wider field than can be accomplished through the injection of antiseptic fluid. Sahli has further shown that the urine of patients who have taken salol internally is aseptic, and that salol in large doses is well borne and never produces toxic symptoms. It is, therefore, quite as suitable for producing antisepsis in the urinary passages as naphthol is for the antisepsis of the intestinal tract. Dreyfuss has employed salol, either alone or in composition with various balsamics, in blennorrhœa, the full dose varying from seventy-five to one hundred and twenty grains. Even in acute cases, treated at the very outset, this method rapidly diminished the secretion, and in some few cases arrested it within a few days. Its effects are especially marked in combination with the use of cubebs or copaiva.

Finally, Dreyfuss recommends this use of salol in operations upon the urinary organs, for in this way the urine is kept aseptic, and one source of danger is thus avoided. Another valuable property which salol possesses is an anodyne or sedative action on the mucous membrane of the urinary passages, about equalling corn-silk or triticum repens.

Dr. Strizower, an eminent German physician, says that, "With the aid of sodium salicylate and salol he has been able to hasten the discharge of gall-stones and to obviate their development. He has stopped prescribing Carlsbad water; and since the anodyne effect of antipyrine became known, he has also discontinued using morphine in cholelithiasis. He administers 0.6 grammes (ten grains) of antipyrine

at the beginning of the attack of colic, and the same quantity of salol or sodium salicylate three to four times daily in the intervals between the colic attacks. This is said to suffice for breaking up an attack. The patients complain no longer of the heaviness in the entire body and the depression usually observed after morphine injections; the attacks become less frequent, and finally stay away permanently.

If the catarrhal cystitis is complicated with uric acid gravel, epigea, piperazin, lycopodium, mitchella, hydrangea, and lithium should be given with the catarrhal remedy.

Turpentine is especially indicated when the urine is bloody. Venice and Chian turpentine have been recommended by Dupytren and Coulson. Turpene hydrate has both caused and cured many cases. When the urine is very alkaline the mineral acids are useful, while the vegetable acids in fruits are to be avoided.

The tincture of the perchloride of iron has been of great service in my hands for the diseases resulting from anæmia. Coulson recommends alchemilla arvensis when there is a large amount of phosphates with the mucus. English writers all recommend pareira brava, combined with nitro-muriatic acid, in typical cases, when the mucus deposit is large, and the bladder irritable.

In cases with a concomitant eczema of the skin I have seen good results from sulphur, graphites, and iodide of arsenic.

Local Medications.— The bladder, when affected by chronic inflammation, is susceptible of being acted on directly by various remedies introduced through the urethra. It rarely happens that patients suffering from chronic cystitis are able to empty the bladder completely; after each effort a certain quantity of urine always remains behind and undergoes decomposition, and thus adds to the irritation. Even the regular use of the catheter fails to remedy this. But if an elastic catheter be introduced and the urine drawn, and then a small quantity (not more than two ounces) of water at a temperature of 100° injected (by means of an india rubber bag, having a stop-cock and a tapering nozzle to fit the urethra), after a short interval the water will escape of itself. This operation should be repeated several times, until the water comes away tolerably clear, when it may be concluded that the bladder has been thoroughly washed out. The water should be introduced gently and slowly, so as not to cause rapid distension of the bladder. The operation should

be repeated every day or oftener if the last portion of the urine continues to contain mucus. The best disinfecting injections are salicylate of sodium (two per cent), saccharin (one to one thousand), eucalyptus water, boric acid (one per cent), balsam of copaiva. (One to two ounces of barley water is recommended by Dr. Devergie.)

Saccharin internally by the mouth, one grain to four ounces of water, has been found useful; also five grains of boric acid to four ounces of water. Both can be given every three hours.

If we desire to get the curative action of a drug on the mucous surfaces, one of the best injections is a solution of colorless hydrastine, one drachm to two ounces of water. A two per cent solution of resorcin is an excellent injection; very weak solution of permanganate of potassium, creoline, thymol, lysol, or pyoctanin may be tried.

In no disease is it more important that the clothing should be warm; all wool next the skin, even in summer, should be worn. The feet should be kept warm and dry. Sudden changes of temperature should be guarded against. A milk diet is often required, and buttermilk or koumiss is often better than milk.

VESICAL DISORDERS OF WOMAN.

It appears to me necessary that a special section should be devoted to the diseases of the bladder in women. In many respects they differ from the bladder affections of men. Owing to certain physical peculiarities, such as the shortness and large bore of the female urethra, and the anatomical relations of the bladder to the pelvic organs, vesical diseases in the female vary considerably from those of the male, and therefore need separate mention. Cystitis, or catarrh of the bladder, is far more frequent in women than in men; but on the other hand, on account of the absence of the prostate gland, and on account of the short and capacious urethra, the former are as a rule less profoundly affected by it.

Vesical troubles in women may arise from the same causes as those in men, such as urinary calculus, gonorrhœa, acrid urine, a chill, etc., but the most common source, beyond all question, is some uterine disorder affecting the bladder, either directly or through

reflex action or irritation. The next cause in order of frequency is hysteria, which will imitate nearly every disease of the bladder, and especially those neuroses of the prostate in men which I have described in previous pages. Some of the very worst and most painful and obstinate cases of vesical hysteria which have come under my care have been in women of middle age, recently married, and probably due to excessive irritation. No ordinary remedy, no matter how closely affiliated, appeared to give relief. Large doses of the bromides, morphine, and hyoscyamus had some palliative effect, but a cure was mainly brought about by hot hip-baths, local application of cocaine, and nightly doses of chloral to induce sleep.

Vesical irritation of a painful and annoying character may arise from anteversion and retroversion of the womb, also from uterine or ovarian tumors. It may be caused by stone in the bladder, by rectal irritation, or a gravid uterus. It is easy to relieve vesical irritation from uterine displacement by the use of a pessary, or by the abdominal bandage when from abdominal tumors, or during pregnancy. If the rectum is at fault try anodyne suppositories, or a final resort to Pratt's or Allingham's operations.

The vesical troubles of school-girls arise from two causes: (1) Neglect of the call of nature, allowing the bladder to fill until the walls are over-distended, with consequent paralysis or spasm; and (2) nervous exhaustion from "cramming," and excessive study. The quickest way to cure these cases is removal from the school to a purer air and an out-of-door life, and regularity in attending to the functions of the bladder and bowels. The best medicinal remedies are belladonna and mono-bromide of camphor.

Many cases of irritable bladder in women can be cured only by dilatation of urethra, even to the extent of causing temporary paralysis and incontinence of urine.

A paper on irritable bladder and frequent micturition in females has lately been published by Dr. Alexander Duke, ex-Assistant Master, Rotunda Hospital, Dublin. "In cases where we are able to exclude the urine itself as a source of irritation, as well as uterine disorders, we are obliged to seek for some other cause. In a great number of these cases there will be found an unnatural appearance of the meatus urinarius, the opening being much smaller and

rounder, reminding one somewhat of the pin-hole seen in conjunction with conical cervix uteri. This description of case is comparatively easily cured by forcible dilatation of the meatus or urethral canal." Dr. Duke has noticed a rather curious phenomenon to occur during the process, that is, the escape of a considerable quantity of urine when the blades of the dilator are freely opened (and this after the bladder has been but a few minutes before fully emptied to all appearances by the catheter), the amount of urine escaping being fully equal in some cases to that previously removed. It has always been a puzzle to him where this urine came from, as the diagnosis of cystocele is a comparatively easy one, and a sacculated condition of the bladder could not possibly exist in all cases in which he has noticed this peculiarity. Dilatation of the urethral canal is the most useful treatment in all cases when the urine is normal, and spasm and irritability is complained of. If there is a manifest want of tone in the bladder, Dr. Duke recommends tincture ferri muriati, cantharides, and nux vomica, which has always given him satisfactory results. The galvanic battery is a dernier resort, and gives most satisfactory results in some apparently hopeless cases, one lady patient having worn a urinal for more than five years, night and day, previous to its employment.

Very obstinate, too, is the irritable urethra of women who have had a severe confinement, wherein the neck of the bladder has suffered from prolonged pressure and the catheter has been used. In these cases cystitis rarely develops unless the catheter is dirty, but a condition of irritability obtains which rivals the hysterical bladder and requires the same heroic treatment. In ordinary cases of nervous irritability of the bladder, such medicines as cantharis, hyoscyamus, cannabis, buchu, epigea, corn-silk, mitchella, galium, and triticum, will remove it. If chronic cystitis is present recourse must be had to injections into the bladder. Boric acid, white hydrastis, peroxide of hydrogen, and eucalyptus have given the best results.

Dr. Katherine Miller, in a recent paper on "Enuresis in Girls," says:

"More common even than enuresis among girls is a form of irritability of the bladder, manifesting itself chiefly in an inability to retain the urine in the normal manner. It is often complained of in school-girls, who are obliged to leave the school-room, even between

intermission, in order to pass the urine, else the bladder, spasmodically contracting, empties itself in spite of every effort of restraint. Even with the promptest attention to its demands, these girls are occasionally subjected to the mortification of wetting their clothing. Oftentimes no complaint is made of any other symptoms than this annoying vesical irritability. The condition is more common at the age of six to twelve or fourteen, but may, if untreated, persist indefinitely. Examination reveals an extremely sensitive and hyperæmic condition about the vaginal orifice, and further investigations will show the extension of this tenderness within the vagina. Often this latter investigation can only be made by the use of an anæsthetic, not only because of the small size of the parts, but because of their extreme sensitiveness. Whatever the cause, the treatment must be directed to the removal of the vaginitis, when the bladder will recover its tone.

"Cleanliness must be enjoined. Not only is careful washing needful, but warm hip-baths are of value. Soothing powders must be dusted on, the vulva being opened as far as possible, and children old enough to understand the aims of the procedure will generally submit to the application, at night, of a small plegget of absorbent cotton, wet with a healing lotion containing pinus canadensis, hamamelis, carbolic acid, or similar remedy, diluted with thin boiled starch. Where the urine is normal, rhus aromatica has proved a valuable aid in controlling the habit of irritability of the bladder and relieving the symptoms, till the cause can be removed."

In similar cases I have found the new remedy, pichi, to be invaluable. In doses of a few drops of the 1x or 3x in young children, conjoined with local applications of calendula and boric acid, it has given prompt relief. Erigeron canadensis has been found useful.

It must not be forgotten that in young female children, vesical irritability of a severe character has been known to be caused by the migration of ascarides into the vagina, and even into the urethra.

Vascular tumors of the meatus are a prominent cause of intense dysuria. Few diseases of such trifling size occasion more distress than these vascular excrescences. They vary in size from a pin's head to a strawberry. They grow from around and on the margin of the meatus, and I have often seen them growing half an inch within the external orifice. They are exquisitely sensitive, and

the slightest touch with a brush, or the passage of urine, causes intense suffering, locally, and a great many distressing reflex symptoms. No internal remedy has the slightest effect. The treatment must be topical. If pedunculated they can be removed with a ligature, but as they seem to grow again from their base, it should be cauterized by chromic acid, fifty per cent, which is the surest, or carbolic or nitric acid. If the ligature cannot be used I prefer to remove them with a pair of curved scissors, taking care to remove with the excrescence a portion of the mucous membrane from which it grows — a fine pair of forceps being used to seize and elevate the excrescence. The actual or galvanic cautery is preferred by some. If very small, touching with chromic acid is sufficient. Before operating the surface should be painted with cocaine solution, twenty per cent, until all local sensibility is destroyed or greatly blunted.

Fissure of the urethra causes as much distress and disturbance as fissure of the anus. Mundè says the latter has caused decided symptoms of cystitis. Fissures at the neck of the bladder is a painful affection, but difficult of diagnosis from cystitis, unless he urethra is dilated and the surface viewed with a uroscope.

Dilatation, until the base of the fissure is deepened, has been known to cure all forms of fissure. Some women are troubled with involuntary spurting out of urine when coughing, laughing, lifting, or reaching up. This is due to a weakness of the sphincter vesicæ, and can be removed by causticum, gelsemium, belladonna, or hyoscyamus 3x, or nux vomica, ergot, or ustilago tincture. Cantharides will cure a majority of such cases, given in doses of a drop or two of the 1x dilution three times a day.

IRRITABLE BLADDER AND URETHRA.

Under this name are arrayed several conditions of the neck of the bladder and the prostatic sinus around the seminal ducts. French writers call it neuralgia of the vesicle neck, but their word "neuralgia" does not mean pain as it does in English. They refer to the hyperæsthesia of the deep urethra and neck of the bladder. The causes, according to Keyes, are numerous, "but none holds the same prominence as does the perversion of the sexual instinct and appetite, its over-stimulation by excess, or more often its imperfect satisfac-

tion." "The action of these causes," he says, "is to congest and keep in a more or less constant irritation the prostatic sinus in the neighborhood of the seminal ducts. This congestion extends readily in both directions, involving the cut-off muscles in front, and creeping backward into the neck of the bladder through the inner orifice of the urethra." Beard describes this condition under the name of "irritable urethra." Next to this sexual cause in producing neuralgia of the vesicle neck, Keyes places the arthritic and gouty diathesis attended by acidity and concentration of the secretions, especially the urine. Other causes are strictures, enlarged prostate, calculi, worms, hemorrhoids, fissure of the rectum, etc. Pratt, in his "Orificial Surgery," dwells upon this disease, which he believes to be produced by disorders of the urethra and rectum.

Symptoms.—The symptoms of a typical case are, according to Keyes, "Frequent desire to urinate, the attack coming on sometimes suddenly, sometimes gradually, without appreciable causes, or perhaps commencing in an inflammatory condition of the parts (gonorrhœa), but not subsiding with the latter. This desire to empty the bladder may or may not be attended by a slight burning pain in the act. In severe cases there is powerful tenesmus (cramp). The relief after urination is usually not perfect, and the desire soon returns. There is often a certain slowness in the act, the bladder contracting without force, and the stream being small, or, on the other hand, the bladder may contract spasmodically when the call comes, throwing out the urine with great force. Again, there may be spasmodic contraction of the cut-off muscles, leading to inability to urinate, or hesitation in the act."

"There are some prominent peculiarities about these calls to urinate. They rarely disturb the patient at night. Once asleep, he rests quietly, but if, from anxiety or other causes, he is restless and wakeful, he is obliged to empty his bladder frequently, by night as well as by day. When under the stimulation of liquor, the urine can sometimes be held for a number of hours. When pleasantly occupied, or deeply interested in anything, as at the theatre, in agreeable company, or engaged at some earnest work, the bladder is often but little, if at all, troublesome. On rainy, damp, or cold days, the calls to urinate are more frequent, perhaps once an hour. The same occurs during illness, and especially during mental worry

or disquietude. The spirits are usually depressed, the patient anxious, perhaps hypochondriacal. The urine is usually clear, rarely shows any purulent deposit (unless the affection has lasted for months or years), but often contains an excess of amorphous phosphates. This deposit sometimes alternates from week to week with a deposit of urates. Sometimes both ingredients exist in excess. Crystals of oxalate of lime are not uncommonly present. There is no soreness over the pubes, though pressure there will sometimes call forth a desire to urinate. In the rectum there is often a slight sensation of heat and uneasiness. There is frequently a dull, dragging, uncomfortable feeling in the perineum, but pressure there is not painful. Erections may be frequent or absent — the latter to such an extent that the patient may believe himself impotent. There may be abnormal feelings of heat and tenderness about the scrotum and testes. Added to these, there may be all sorts of functional disturbances of the bowels, often constipation, with feeling of lassitude and a general weakness. Spasmodic stricture of the urethra may come on as an accompaniment of this condition, while great irritability of the cut-off muscles exists as a rule. Nocturnal emissions are not infrequent."

The diagnosis of this condition from organic diseases of the bladder is best described by Keyes, who relies mainly on the results of a physical examination. He says: "On exploring the urethra with a full-sized blunt steel sound in these cases, it is customary to find the whole canal sensitive and irritable. The muscular fibres contract about the instrument, and oppose its progress. At the membraneous urethra, the cut-off muscles contract spasmodically, often sufficiently to bar the progress of the sound entirely, and give the idea of organic stricture. As the instrument advances, the cut-off muscles may be felt to quiver in slight partial contractions, while the patient complains greatly of pain. When the beak of the sound enters the prostatic sinus, the patient is very apt to feel faint. He may indeed go into syncope, or have an attack of nausea; or, perhaps, a sexual orgasm may be induced, in which case the prostate and cut-off muscles contract violently on the sound, causing the patient considerable pain. As the sound passes the neck of the bladder, either the natural feeling of a desire to urinate will not be perceived or (usually) the sensation will be highly exaggerated and painful. Sometimes spasms of the bladder will be induced and the

instrument will be forced out, or a jet of urine may gush out along the urethra outside of the instrument. On withdrawing the sound, a little blood will often be found upon the beak, but the patient as a rule feels relieved, and will often experience for hours thereafter an ease and local comfort such as he has been a stranger to for months, perhaps for years; his interval for urination being decidedly lengthened, although the smarting at the next urinary act will be greater than before. The above general outline of symptoms will include most cases of pure neuralgias of the vesical neck, where there is no lesion, and has been no serious antecedent disease."

Treatment.—The moral and hygienic treatment are most important. If the patient is single he should get married. No clandestine sexual intimacy can approach the curative influence of a marriage based on love or respect. If this is not feasible the mind should be directed into quiet paths of study, work, or out-of-door life free from excitement of any kind affecting the sexual life. Alcohol and tobacco in excess should be avoided. These rules will place the patient in a curable condition if they do not cure. If the urine is acid it should be made alkaline; mineral acids should be given if the urine is alkaline or phosphatic.

There are certain medicines which physiologically act as sedatives to the bladder, deep urethra, and seminal vesicles. The most potent are corn-silk, hyoscyamus, epigæa, triticum, galium, buchu, salix niger, monobromide of camphor, ferro-cyanide of potassium, salicylate of sodium, salol, plantago, and rhus aromatica. These should be used in small but material doses of the tincture or 1x trituration. Equally important are a class of medicines capable of causing a similar condition. The most typical are cantharis, phosphorus, nux vomica, aurum, and equisetum. But the whole range of vesical irritants should be consulted and the remedy selected by the totality of the local and general symptoms of the patient, and given in the smallest doses that will act on the organism.

Keyes and Pratt are emphatic in their praises of the steel sound. They declare that nothing is so potent in a pure case where the nervous element is predominant. It should be well warmed and oiled and introduced with the utmost gentleness. The time for a reintroduction will depend upon the duration of the effect of a single use of the instrument.

"If there is prostatitis or cystitis the instrument will aggravate the local condition; if neuralgia, its gentle use will always be followed by comfort, and the relief will last a variable time. In old subjects it is sometimes necessary at first to reintroduce the instrument every day, in younger subjects, every second, third, or fourth day. The action of the sound seems to be to blunt the morbid sensibility of the parts by pressure, to improve the circulation by temporarily squeezing out the blood, and by putting the irritated muscles slightly on the stretch." (Keyes.)

A common cause of irritability of the bladder and urethra is catheterization. A patient who has never had the slightest irritability is catheterized for a retention, from a cold or spasm of the urethra, or after confinement. Sometimes one introduction of the catheter is sufficient to set up an irritability that will last for weeks and months. We are often in too great a hurry to relieve patients from temporary retention.

The properly selected remedy (cantharis, hyoscyamus, gelsemium, or apis) will generally relieve the retention. I would not advise waiting more than twelve or eighteen hours, but I do protest against resorting to the catheter too soon, or using it too often. Two or three times a day is sufficient.

The treatment of irritable bladder and urethra from this cause consists in using the soft velvet catheter in preference to others, using sterilized olive oil, and in some cases the one per cent solution of cocaine in the oil. The medicines indicated are arnica if the catheter has bruised the tract, or if the urethra has been bruised during labor. Corn-silk is an excellent remedy, in doses of ten to thirty drops every four hours. Pariera brava is praised by English writers.

If there are violent painful spasms of the bladder and urethra, gelsemium, in doses of three drops every one or three hours, is a potent remedy. (Also phenacetin.)

Hyoscyamus, belladonna, hydrangea, and viburnum sometimes act well in small but not minute doses. In very severe cases when immediate relief is demanded, inhalations of chloroform and amyl nitrite acts quickly (one drop of amyl to one drachm of chloroform).

Irritable bladder is a frequent attendant on prostatitis, hemorrhoids, and uterine disorders. In some cases the above medicines

will only act as palliatives. The radical treatment must be directed to the origin of the disorders.

INCONTINENCE OF URINE.

There are several varieties of this affection: it cannot be called a disease, because it is only a symptom of some disease. It may be divided into four forms: (1) incontinence in adults; (2) nocturnal incontinence in children; (3) diurnal incontinence in children; and (4) chorea of the bladder.

(1) Incontinence in adults may be simply an overflow from retention, or "it may be caused by an unsymmetrical development of the prostate, when, after the collection of a little urine, the rest trickles away, there being no distension of the bladder. It may be caused by concentric hypertrophy of the bladder where the viscus cannot distend, and all urine above a few drachms must flow at once away. Paralysis of the cut-off and sphincter muscles of the bladder, with or without paralysis of the detrusor urinæ." (Keyes.)

Nocturnal incontinence of children is one of the most disagreeable and obstinate affections that physicians have to contend with. It often originates in mismanagement. Mothers allow children to drink largely of fluids before going to bed, which should never be permitted. Children should be taught to urinate before going to bed, else they will fall asleep with a full bladder. Children who urinate at night are generally very sound sleepers, and this deep sleep may be caused by the toxicity of the urine. The fact that children are sometimes the subjects of diabetes and Bright's disease should not be forgotten; also that the first symptom of these diseases in children is nocturnal enuresis. Gravel, particularly lithic acid, and an acid state of the urine, may be a cause of this symptom. It may be a symptom of epilepsy; the child may have a nocturnal epilepsy (*petit mal*), and the wet bed be the only symptom observable. It may be caused by phymosis and the irritating smegma consequent upon it. The external urethral orifice may be narrowed. The prepuce may be adherent to the glands. Thread-worms in the rectum or vagina may cause it. It is one of the symptoms of hip-joint disease. "In the common form of incontinence occurring at night only, the irritability of the muscular coat of the bladder is

exaggerated, and the resistance of the sphincter is relatively deficient. There is no atony of the sphincter, but on account of the increased pressure against which it has to contend, it requires to be strengthened by voluntary agency. During sleep the agency of the will is removed and the sphincter can no longer effectually resist the action of the irritable muscular fibres, so that the contents of the bladder are discharged. In cases when, in addition to the abnormal excitability of the muscular coat, there is a certain degree of atony of the sphincter, the patient has little control over his bladder even in the daytime. The desire to urinate is frequent, and when it appears it cannot be retained even for a few seconds." (Eustace Smith, "Diseases of Children.")

This symptom is often intermittent or recurrent. For a week or more the bed is wet every night; then it will remain dry for an equal time or longer. When the child is feeling well it disappears, to return when the child feels ill or nervous.

Frightful dreams, or a loud noise at night, cause incontinence in nervous children. Spontaneous cures are common; the child suddenly ceases to wet the bed when no medicine is taken. The child "outgrows" it; some change in the system at seven or fourteen years seems to end the trouble. This explains why so many drugs get a reputation for its cure. They happen to be given about the time of the curative change in the growth of the body.

Treatment.—The first indication is to remove all apparent external sources of irritation. The elongated and adherent prepuce should be removed or dilated, and all its adherent surface separated. The external meatus should be cut or dilated. Many cases have been cured by the passage of the sound into the bladder. Thread-worms should be expelled from the rectum by an enema of naphthaline two per cent. The urine, if acid, should be rendered alkaline by the bicarbonate of potassium. If ammoniacal, by the benzoate of lithium or potassium, or benzoic acid. If the frænum is too short it should be clipped. If the rectum should be full of fæcal matter, a small enema of glycerine and water should be given before the child is put to bed. When enuresis, day and night, is caused by irritability of the bladder with atony of the sphincter, the remedies are belladonna, hyoscyamus, gelsemium, stramonium, corn-silk, triticum repens, or equisetum, in the lower potencies. It is a fact that can-

not be denied by our school, that belladonna and hyoscyamus can be given to children in larger doses than to adults.

The fear of the low dilutions in case of infants is baseless. What has been considered aggravations from the use of belladonna in children has been the appearance of symptoms belonging to the disease, not the drug. No true pathogenetic symptom has yet been recorded from the use of any of the dilutions when given to children. According to Eustace Smith and many others, cures of nocturnal and diurnal enuresis have been made by the use of doses as large as twenty to thirty drops of the tincture three times a day, without any other observable symptom than dilatation of the pupils. Sulphate of atropine has cured nocturnal enuresis in children in doses of 1-500th down to 1-100th of a grain three times a day without causing any disagreeable symptoms except dryness of the throat. The indications for belladonna, hyoscyamus, and stramonium given in our text-books are untrustworthy because they confound primary and secondary symptoms and several diverse conditions. For these remedies the indications which accord with their primary action are atony or paralysis of the sphincter and cut-off muscles that cannot retain the urine when the bladder is partly filled. Here minute doses may cure (from the 2x to 6x), but they will have no influence in that secondary state of irritable bladder and its sphincter described above, where physiological doses are necessary.

Several cases of nocturnal incontinence in young girls who, notwithstanding the fact that they emptied the bladder, wet the bed towards morning, I have cured with hyoscyamus (mother tincture), five drops every evening. Several similar cases were promptly cured with hyoscine 3x (1-1000th grain) three times a day.

Rhus aromatica has been found very successful in atony of the sphincter causing nocturnal urination. The doses have ranged from ten drops of the tincture to a drop of the 1x. Rhus tox and rhus radicans are suitable for the worst cases when the urine runs away all the time during sleep, day or night, as during or after typhoid fever. Nux vomica and strychnine are invaluable in children whose spinal energy is so deficient as partly to paralyze the nerves that preside over the neck of the bladder. Such children urinate if startled or frightened, or while engaged in games during the day; then the 2x of nux and the 3x of strychnine are appropriate. When children

wake from sleep with fright and great agitation and unconsciously urinate, the specific remedies are aurum bromide 2x, or hyoscine 3x. Ergot is suitable in enuresis from paresis of the sphincter. In large toxic doses it causes tetanic spasm of the sphincter and cut-off muscles of the neck of the bladder. This primary effect is followed by the opposite condition, paralysis. The curative doses for this paralytic enuresis is five to ten drops of the normal tincture or fluid extract, or the 1x trituration of good ergotine. Ustilago has a similar action. Turpentine has an action almost opposite to ergot. Primarily it causes an irritable bladder which overcomes a weak and irritable sphincter. The desire to urinate is frequent when awake, with inability to hold the urine. When asleep the urine passes frequently and involuntarily. Turpentine 3x will cure all such cases. Erigeron, copaiva, cubebs, and especially cantharides cause similar conditions. Some of the most notable cures of obstinate cases ever reported have been made with cantharides, in doses ranging from one drop of the tincture to the 3x dilutions.

Ferrum seems to be especially suitable in diurnal incontinence. Santonine is a favorite remedy with many, not because it destroys intestinal parasites, but because of its action on the cerebro-spinal centres, first as a depressant, second as an excitant. The dose is from the 1x to 3x trituration.

Piper methisticum cured six obstinate cases reported by Dr. Palmer, of Lockport, N. Y. Gandez, of Paris, praises very highly antipyrin; several others confirm his recommendation. The usual dose is five grains given two or three times in the evening at intervals of two hours.

Dr. Sanger has found good effects from the mechanical method of introducing a metallic catheter into the bladder of female children, making firm pressure backward and to the sides several times, while the thumb covers the aperture of the instrument. Ten or twelve sittings are said to be usually efficient.

A writer in the London "Lancet" recommends the birch rod applied before the child is put to bed, "not as a punishment but in a true scientific spirit." Six is the regulation number of strokes. After the third seance the cure is complete. The rationale of the method is that it awakes in the boy a desire to avoid wetting the bed; it draws the blood to the surface for a few hours, and thus

relieves the pelvic organs; it stimulates the lumbar centre controling micturation through the nerves distributed to the upper gluteal region, and prevents the patient lying on the back. Dry-cupping would probably be just as efficient. Dr. Kupke thinks it possible that incontinence is often the result of a weakness on the part of the spinal cord, which loses its power to transmit to the brain the impression of distension of the bladder. On the other hand, we must also admit that an anæsthetic condition of the sensitive nerves of the bladder can occur, by reason of which the micturition centre of the spinal cord is only feebly made aware of the need to urinate. He recommends Gunyon's method of electrization as most rational. This consists in introducing into the urethra as far as the membraneous portion a metallic sound, to which an electrode is attached, the other electrode being placed over the pubes or on the perineum. The current should be quite weak at first. Others apply one of the poles over the vertebral column and the other on the symphisis pubis. Phosphate of strychnine 3x should cure the majority of such cases. All rational physicians denounce corporal punishment. It is cruel and demoralizes the child, and never has been productive of any benefit.

Cold sponging in the morning is very serviceable in cases of an enuresis that appears to have its origin in general debility. It braces up the nervous system and is a powerful tonic. The slight sensation of chilliness soon passes away without leaving any depression if vigorous friction with a towel be employed for a few minutes. The vital functions are brought into a healthier state, the skin acts better, and the appetite and digestion improve. However delicate the child may be, free sponging in tepid water, followed by a good rubbing, is of great value. The water may be used at a temperature of 90° at first, and as the child becomes stronger may be lowered to 70°. The reason of most of the failures to cure enuresis is that the medicine is not continued long enough. Atropine was used in fifty cases in doses of 1-500th to 1-100th of a grain every evening for five months. Nearly two-thirds of the patients were cured in periods varying from one to five months. Equisetum may have almost immediate good effect, but in some cases it requires to be used a month or two. The same can be said of nux vomica, strychnine, rhus aromatica, ferrum, and many if not all the indicated medicines.

Schuessler recommends for nocturnal involuntary urination phosphate of magnesium for diurnal; phosphate of iron when from weakness of the sphincter; phosphate of potassium when from paralysis of the sphincter and nervous debility; phosphate of sodium when from acidity; and phosphate of lime in general. Now, involuntary micturition is not found as a symptom in the provings of these drugs. They are recommended theoretically on the bio-chemical theory — a theory which Hahnemann denounced with all the vigor of his trenchant pen. There have not yet appeared any clinical reports substantiating the recommendations of these medicines in this disease.

In my "Therapeutics of New Remedies" I collected evidence apparently proving the value of bromide of potassium, cedron, chloral, eupatorium purp., gelsemium, plantago, rhus aromatica, santonine, strychnine, and dimiana in the treatment of enuresis. The reader is referred to that volume.

In a recent clinical lecture, Dr. T. F. Allen prescribed successfully for diurnal and nocturnal incontinence, causticum 3x; together with the incontinence this drug has "excessive quantity of urine." Its symptoms all point to atony of the sphincter and incompetence of the cut-off muscles: for the urine is voided on coughing and any sudden exertion.

Dr. J. P. Tessier, of France, reports that "Eupatorium purp. has been a curative remedy in the diurnal and nocturnal enuresis of a boy fifteen years old, suffering from this condition since his childhood. It also cured the nocturnal enuresis of two old men, and diminished the frequency of the emissions. Same success for one tabetic of forty-eight years old; the locomotor ataxia did not improve, but the symptoms of paralysis of the bladder were suppressed."

Chorea of the bladder, according to Keyes, is a rare affection, and only occurs in children. It usually coincides with other choreic symptoms. He gives three interesting cases. They were characterized by paroxysms of incontinence; they sometimes wet the bed, but not invariably; it occurs when at play; they run to their mother when they wet their clothes, declaring they cannot help it. One had no other choreic symptom except in one eye; another had twitching of the head and shoulders; a third had general choreic twitchings. All had involuntary spasmodic emission of urine, which they could not control. I believe I have seen several similar cases,

but failed to recognize the choreic element. This element we should be on the watch for, as the treatment should be quite different from that adopted in ordinary cases. Keyes cured his cases with iron and arsenic. I would recommend in addition agaricus, arsenite of copper, cimicifuga, and myalgæ. In some cases stramonium and hyoscyamus will be indicated.

The diagnosis between this affection and irritable bladder will be found perplexing, as they have many symptoms in common.

Lately, phenacetin has been recommended for urinary troubles in advanced life. Dr. Traill Green ("Univ. Med. Magazine," June, 1892) says, "The majority of such troubles present symptoms of excess of uric acid or urates in the urine, and the subjects probably suffer from rheumatism or gout, and acquire the habit of too frequent urination. In many cases there may be an irritability of the bladder. During the past year the writer attended a patient for whom he had prescribed for a year or two for frequency of passing urine. While under treatment for another affection, he had occasion to prescribe a dose of phenacetin, and was glad to learn the following morning that the patient had passed the night without a call to pass water. The medicine was continued in doses of ten grains for several nights, and rest for eight hours, from 10 P. M. till 6 A. M., was produced. The patient did well until the summer vegetables and fruit, like tomatoes, were eaten, when night troubles from frequent urination returned. Phenacetin was again prescribed, with immediate relief. The particulars of another similar case are also given. The writer has not used this medicine in any case of enlarged prostate, as that disease requires other treatment. He is satisfied that the effect of phenacetin does not depend upon any property which it may possess of producing sleep, since the patient may awake during the night without being called upon to urinate; and sulfonal and other remedies of the same class, as he has found on trial, do not act in giving rest like phenacetin. Phenacetin may be recommended, if for no other reason than that it allows the bladder to be distended for eight hours, and so prevents the reduction of the capacity of the bladder, as is known to occur when the urine is discharged as soon as two or three ounces collect in it; so that the organ must be distended by injections of water to restore it to its usual capacity, in order to relieve the sufferings of such as have a bladder con-

tracted by frequent urination. As to the action of phenacetin, it is possible that the bladder is irritated by the urates, and this is allayed by this medicine, similarly as it acts in rheumatism and neuralgias. The quantity of urine is not diminished, as far as has been observed. The writer recommends this treatment, and hopes that readers will report such results as they may observe."

For several years I have used phenacetin and salol for all painful bladder diseases, especially chronic cystitis and irritable bladder. Both act as sedatives to the nerves of sensation, and the mucous surfaces of the urinary tract.

In children and sensitive women, the 1x trituration in two-grain doses every hour or two acts admirably. I do not hesitate to give five or ten grains of phenacetin at night if hyoscyamus or conium fails to quiet the bladder and allow sleep.

RETENTION OF URINE.

Definition. — A condition of the bladder and its neck in which the bladder fills up, and the urine is not or cannot be passed. This condition must be clearly differentiated from suppression, where no urine comes down from the kidneys. The condition can always be quickly recognized by percussing the hypogastrium, or by palpation. In retention the hypogastrium will be found swollen, and the outlines of the bladder can be felt if the patient has not a great deposit of fat in the abdominal parietes. There is dulness on percussion, while in suppression, the abdomen is flat, the bladder cannot be felt, and there is resonance or tympanitic sound on percussion.

Causes.—The causes of retention are: (1) Voluntary retention, often repeated and long continued. This often occurs in boys and girls confined in school, and in women who, from false delicacy, will not empty the bladder when it is full. If this practice is kept up, it may result in positive inability to void urine owing to paralysis of the bladder from over-distension. (2) Spasm of the cut-off and sphincter muscles, which may occur from irritability, or reflex causes in the rectum, or from mental shock. (3) A blunted sensibility of the bladder, such as occurs in fevers, coma, and some brain diseases. (4) Urethral obstruction from stricture, calculi, enlarged prostate, and urethritis.

In some cases the retention is not complete, a little urine passing away occasionally, or flowing drop by drop during great straining efforts.

Diagnosis. — Pressure on the bladder usually causes a desire to urinate. One of the means of diagnosis is to place the hand on the region of the bladder, and a finger in the rectum. Fluctuation can then be made out. In cases of long retention there is some danger of rupture of the bladder, but Keyes says the bladder will not burst unless it be previously ulcerated or subjected to mechanical violence when full. After it has been over-distended for a time a certain amount of dribbling will take place through almost any obstruction.

Gant ("Diseases of the Bladder") says: "Unrelieved retention of urine leads generally to rupture of the urethra, and especially when the source of obstruction is in the urethra, the canal yielding behind that point, and this event being followed by extravasation of urine."

Treatment.—No physician will allow a retention of urine to reach serious proportions before using the catheter. The safest and best to begin with is the soft, velvet-rubber catheter. If this fails, more unyielding ones will have to be used. Spasmodic retention of urine can usually be relieved by the sitz-bath, warm water applied to the genitals, or hypogastrium, or a warm-water enema. There is a curious sympathy between the sphincter of the bladder and the sound of running water. I have known a great many instances when the opening of a faucet, or pouring of water from a pitcher or kettle, has caused the relaxation of a spasmodically closed sphincter. Chloroform has been useful. In several cases occurring in women and girls, a few whiffs of chloroform caused complete emptying of the bladder. There are many neurotic men and women who cannot urinate when another person is in the room, or on railroad cars when they are in motion. They must have silence and isolation.

There are several drugs which cause spasmodic stricture of the sphincter of the bladder, and cut-off muscles by an action through the nerve centres. Nux vomica, ergot, belladonna, hyoscyamus, have this effect primarily, and can be used effectively in spasmodic retention when given in very small doses (1x to 3x). Secondarily they cause paralysis of the bladder with relaxation of the sphincter, and in such cases are very effective in large doses. Other drugs cause spasm and

contraction of the sphincter vesicæ, by their local irritant action. Among these are cantharis, turpentine, copaiva, cubebs, pichi, oil of sandal-wood, equisetum, cannabis, apis, and many others. When these are indicated by their primary symptoms the smallest dose suffices to remove the local irritation of the neck of the bladder. I have known the 6th of cantharis and turpentine to give quick relief. All these drugs also cause, secondarily, a paresis of the bladder, a blunted sensibility, and even complete paralysis, which at times leads to retention, at other times to incontinence of urine. When secondarily indicated the dose must be stronger — the 1x, or even five or ten drops of the tincture. This is not theoretical, but is substantiated by my own experience and the clinical records found in old-school practice. The law of similia is potent in and applies to both conditions.

ACUTE INFLAMMATION OF THE PROSTATE.

Diseases of the prostate gland afford a most interesting study. They cause as much pain and suffering in men, as do diseases of the uterus in women — with which organ it is homologous.

I shall quote largely from Sir Henry Thompson's great prize essay on "Diseases of the Prostate," the most complete monograph yet written.

"Acute inflammation of the prostate," he writes, "is by no means a common affection, if regarded as distinct and unassociated with inflammation of the urethra or bladder. When the latter organ is inflamed, the prostate appears sometimes to suffer, although in a secondary manner and degree. But in obedience to the common law which seems to apply to tracts of mucous membrane generally, inflammation appears commonly to travel from the external to the deeper parts. Accordingly, an attack of urethritis, involving the external inch or two of the urethra may spread inwards and fix itself, as I believe is not infrequently the case, upon that portion of the canal which is most largely surrounded by vascular tissue, viz., the bulbous portion. Hence, probably, the origin of stricture-formation affecting that locality especially. But it may proceed, as an exceptional occurrence, more deeply still, and the prostate becomes the subject of inflammatory action. Such is the most common mode by

which this organ is involved. It may not be out of place to observe that in the respiratory tract the same line of march from the external to the internal parts is observed. A catarrh, for example, is the first sign of inflammation in the mucous membrane of this region; the action may gradually spread to the throat, larynx, bronchi, and so on to the lung-substance itself. The converse order of things we do not observe; and after the same manner also in the genito-urinary tract we find that inflammation is to be traced, as a rule, from the urethra to the prostate, bladder, ureters, and, last of all, it may be, to the kidneys. Sometimes, however, the prostate is inflamed apparently as a purely idiopathic occurrence, and from continuity of tissue with adjacent parts. This, excepting the cases produced by violence, as by instruments, etc., is probably extremely rare.

"*Causes.* — Systematic writers on this subject enumerate many circumstances as giving rise to acute inflammation of the prostate. The relation between some of these and the supposed effect appears, however, to be less clear than the precise statements generally made might lead the inquirer to imagine. The alleged causes may be arranged for consideration in three classes, as follows:

"(a) Undoubted causes of acute prostatitis.

The pre-existence of acute inflammation of the urethra of any kind, but especially the gonorrhœal, by continuity, as already alluded to.

Urethral stricture in an aggravated form, tending as it does to the production of inflammation and disorganization of all the parts posterior to it, especially those more immediately adjacent, as the prostate and bladder. The direct application of irritating agents in the shape of strong injections, cauterization, and mechanical violence of various kinds. Inflammation of the bladder sometimes. Calculi of the bladder and of the prostate itself. The application of cold and damp to the perineum, as by sitting for a long period on moist ground. Urethritis has been referred to as a proximate cause, but it may also be the remote cause in the circumstances last enumerated, as well as in some of those which come under the next head.

"(b) Circumstances which cannot be stated with absolute certainty to be causes, but which may, with some amount of probability, be so regarded. Horse-exercise is constantly said to be a cause of acute inflammation in the organ, by means of the concussion occa-

sioned. Evidence is wanting, I think, to establish this. That it may aid in producing it when some inflammation of the urethra already exists is quite possible. Certainly it cannot be said that hard riders, such as huntsmen, jockeys, but above all the cavalry soldier, from the nature of his seat, are in any notable degree more subject to it than other men equally exposed to other and better recognized sources. Cantharides may, perhaps, occasionally act as a cause when taken internally, but probably never without primarily affecting the kidneys and also the bladder."

It has never been proven that bicycle riding has caused injury to the healthy prostate.

"Alcoholic drinks, especially when mixed with acids, as punch, may induce prostatic inflammation, gonorrhœa already existing, but only on this condition. Inordinate sexual intercourse, under the last named circumstances, may probably be assigned also to the present category.

"(c) Circumstances stated to be causes by numerous authors, but respecting which there is either little or no evidence to render it probable that they are so.

"Diuretic medicines, copaiva, cubebs, and turpentine, even coffee and highly-seasoned dishes, are said to cause inflammation of the prostrate. Drastic purgatives are similarly regarded by some. Irritation in the rectum by ascarides, hemorrhoids, etc., are enumerated as causes. All these may, and do undoubtedly, sometimes induce an irritable condition of the bladder, and some of them, perhaps, even some degree of inflammation of the viscus; but I am not aware of any authenticated case of acute prostatitis directly or indirectly occasioned by any of these agents.

"The morbid condition of any of the organs which exist in the presence of carcinomatous infiltration, or of tuberculous deposit, cannot be regarded as by any means identical with the affection now under consideration. Nevertheless, the diseases referred to are commonly enumerated as causes. Such a course appears to involve confusion, and to destroy the definite meaning of terms, which it is extremely desirable in all pathological studies to maintain distinct as far as possible. Sedentary habits are spoken of as a cause of the affection, but without the slightest shadow of evidence to support the assertion, as far as I have been able to discover. The same also

may be said with regard to a constipated habit of body. It is probable that want of exercise and a torpid state of the bowels both tend to induce a loaded condition of the veins of the abdomen, and among them those of the prostate; and in this manner a mechanical congestion of these vessels, which are prone to be large and dilated, as well as of the proper capillaries of the organ, is doubtless favored; but that this can be considered causal, even in a secondary or predisposing relation, of acute inflammation it is not very easy to believe."

Horseback and bicycle riding have been assumed to be a cause of prostatitis, but without sufficient proof. Thompson says the English cavalry suffer no more than others, and Dr. W. S. White, of Chicago, in the "Clinical Reporter," writes, "If the saddle is properly adjusted the rider can sit on the tuber ischii, and have very little pressure on the perineum."

"*Symptoms.*— At the outset, a sensation of weight and fulness about the rectum and perineum is experienced, with some pain and uneasiness referred to the neck of the bladder. The patient required to pass water more frequently than natural, and does so with an increase of the existing pain, especially at the close of the act. These symptoms increase; the pain becomes severe, then lancinating and pulsatile, and almost continuous; a sense of tension and swelling is experienced, and the anus and perineum are tender when pressed upon. Movements of the body become difficult on this account, as does also the sitting position. The act of relieving the bowels at stool produces considerable distress; still more so does the act of micturition; the stream of urine being generally small, and its passage necessarily prolonged, much straining accompanies it, and the pain is exquisitely acute. As the organ increases in size and tension, complete retention of urine may occur and continue for some days. In these circumstances a finger introduced into the rectum encounters much opposition, however quietly it is carried through the sphincter; the anterior wall of the bowel is prominent, hard, and hot, and the outline of the prostate may be traced, not, however, without causing great suffering to the patient. An attack of piles may be induced, the close contiguity of the hemorrhoidal and prostatic veins appearing to favor this result. At a later stage, if suppuration has taken place, the rectal swelling is softer, local throb-

bing is experienced, and should a catheter be passed, the patient will complain of excessive pain when the instrument reaches the prostatic part of the urethra. General fever, in a greater or less degree, manifests itself after the accession of the earlier local symptoms, rigors and exacerbation accompanying the onset of suppuration. Pains in the back and loins, as well as in the glans penis, and running down the thighs, are experienced, and not infrequently a sensation of constant desire to go to stool. The mucous membrane of the bladder participatess sometimes, not always, in the inflammation; the urine is febrile in character, and contains mucus to some amount, occasionally in considerable quantity, the latter condition if the last named structure is implicated. Besides this, there may be pus in the urine to a greater or less extent, from which it is deposited as a sediment on standing."

"The chief signs upon which a diagnosis depends may be noted as follows: Enlargement of the prostate, ascertained by rectal examination, the prosecution of which is extremely painful to the patient, with acute pain complained of when pressure of the finger is made upon any part of the swelling there. The act of defecation is often productive of much distress; that of micturition still more so, complete retention often supervening. If the catheter is introduced, exquisite suffering is caused when it arrives at the prostatic part of the urethra. Added to these, there is a constant and deep-seated, often throbbing, pain felt about the fundament. These symptoms alone, but especially when associated with a history of recent urethral discharge, which may have previously ceased or not, will suffice to determine the nature of the case." (Keyes.)

Treatment. — Sir Henry Thompson considers it very important that the rectum should be kept free from fæcal matter. Nor should fæcal matter be allowed to remain in the colon. I have often given quick relief from the pain, throbbing, and constant desire to urinate by a hot rectal douche when anodyne suppositories failed. The smallest piece of hard fæces in the rectum will cause great pain in an inflamed prostate. The local abstraction of blood by means of leeches was once considered important. No doubt the abstraction of a few ounces of blood from the anus and perineum will lessen the pain and engorgement temporarily. I do not think the relief is permanent. The hip-bath and a poultice to the perineum are both useful

The sitz-bath should be continued eight to ten minutes, the water at first at 80°, raised gradually to 105°.

"One of the most troublesome conditions met with is retention of urine caused by the barrier which the swollen prostate offers to micturition. The stream diminishes, at last ceases, and it is then absolutely necessary to pass a catheter as many times in the day as the comfort of the patient requires; four times in twenty-four hours. The best instrument as a rule is a flexible catheter, well curved, and of rather small size, say No. 5, 6, or at the most 7. It is to be removed as soon as the bladder is emptied, and employed so long as the bladder is not emptied by the natural efforts." (Thompson.)

We should watch for fluctuation. If it is deep, the pus may be discharged when using the catheter. If it can be readily felt through the rectum, an incision should be made.

The diet should be cooling, bland, and containing no seeds or hulls which might lodge in the rectum. Coffee and all alcoholic beverages should be strictly prohibited. Rice, wheatena, granulated barley, milk-toast, milk, Vichy water, spinach, and apple-sauce are all that is necessary until the inflammation and swelling is reduced. It is often a month before the size of the prostate and its tenderness entirely disappears and much longer if the patient will not keep quiet and diet properly. The medicines most appropriate for acute inflammation are aconite, veratrum viride, gelsemium, and belladonna, prescribed as the symptoms indicate.

Aloe is indicated if the inflammation has been caused by purgatives, or is counected with piles; cantharides when it arises from excessive sexual indulgence; copaiva when it is connected with gonorrhœa (cubebs and sandal-wood when from the same cause); gelsemium is almost specific when prostatitis results from suppression of a urethral discharge by astringent injection; the discharge soon returns, with relief to the inflammation. Pulsatilla, chimaphila, thuja, senecio, apis, are often indicated. Digitalis, recommended by Lippe, is useless, as it has no affinity for the prostate.

CHRONIC PROSTATITIS.

The most complete and scientific description of this disease is found in Sir Henry Thompson's great work on the Prostate. This has been admirably utilized by Dr. Keyes in his "Diseases of the

Genito-Urinary Organs," who has added matters of great value from his wide experience.

"Chronic prostatitis," says Keyes, "is met with in three different phases, but the symptoms and pathological characters are much the same in each, and differ in degree rather than in kind. It may originate solely in an attack of acute prostatitis, and be due to a morbid persistence of unhealthy action, which shows no disposition after the acute symptoms have subsided; or secondly, there may be a long and tedious resolution, naturally leading, but by slow steps, to the reëstablishment of healthy action; and, finally, the condition may commence in the chronic form, independently of any acute attack, in which case it may be the primary or sole existing complaint, or it may be dependent on disease of adjacent organs.

"It is common to meet with instances in which simple chronic inflammation of the prostate, producing enlargement, is regarded as an example of hypertrophy. Yet nothing can be more distinct than the two affections, if we compare their pathological history and characters. Chronic inflammation, however, by no means necessarily causes enlargement of the organ; indeed, this is an exceptional condition, all varieties considered. But when inflammatory enlargement does exist, it is almost invariably in the early or middle periods of life; while hypertrophy never occurs before the fiftieth, very rarely before the fifty-fifth year, and it is not commonly manifested by symptoms before the fifty-seventh or eighth year. Inflammatory enlargement is almost invariably preceded by some urethral inflammation. Urethral discharge of a purulent nature, urine containing small flocculi, and pain during and after micturition, have been or still continue present. Associated with these, there is often an impaired condition of the general health. All these may be, and usually are, absent in hypertrophy during its earlier stages. Finally, inflammatory enlargement is due to the effusion of morbid products, lymph, pus, etc., into the substance of the organ; while a hypertrophic enlargement is due, as the term implies, to simple over-production of the normal elements of the prostate gland itself.

"*Causes.*— The most fertile cause of chronic prostatitis is gonorrhœal inflammation, which has extended backwards and affected, more or less acutely, the prostate. Local cold and damp must be

recognized as occasionally producing it; more rarely still it is due to mechanical injury inflicted on the urethra or in the perineum. Long-continued indulgence in venereal excesses of any kind is undoubtedly a cause. That form which results from long-standing and severe stricture of the urethra, of chronic cystitis, of calculus, either vesical or prostatic, is common enough, and needs no separate consideration; it is the mere result of existing adjacent disease, upon which it altogether depends."

"*Symptoms.*—A patient who suffers from simple, uncomplicated chronic inflammation of the prostate complains of a little undue frequency in making water, sometimes of muco-purulent discharge from the urethra, of a sensation of weight and fullness, sometimes of dull pains in the perineum and about the anus, which may be occasional or persistent, but which are almost always increased by exercise; often of pains in the thighs and legs, or in the sacral region; sometimes increased, but not invariably, by sexual intercourse.

"There is usually no pain in micturition until the end of the act, when it is occasionally but by no means always felt, and then it is never very acute like that of calculus. There may be tenderness in the perineum, sometimes felt in the sitting posture; tenderness in the prostate itself to rectal examination; an irregularity in form is sometimes detected by the finger, but this is exceptional; and there is not necessarily any enlargement. The passing of a catheter gives more than usual pain when it traverses the prostatic urethra and neck of the bladder. The urine is a little cloudy, but on examination this condition is found to be mainly due to shreds of tenacious muco-purulent matter, and masses of epithelium, which have their origin in the prostatic urethra and not in the bladder, as may be ascertained by desiring the patient to pass water into two glass vessels, the first ounce or so into one, the remainder into the other, when all the purulent matter will be found in the former portion, while the latter is clear. This mode of examining the urine is one to which I attach considerable importance. It separates purely urethral products from the deposits which come from the bladder or from the kidneys, and which are otherwise likely to be attributed to the latter sources, or at all events to be misunderstood. For all purposes of urine examination this proceeding ought to be pursued. In well-marked cases, there appears at the end of micturition a drop of blood, sometimes

more than that, tinging the last portion of the urine passed — an occurrence often leading to a suspicion that calculus exists. This sign, as well as the simultaneous pain experienced, and the fact that the symptoms are increased by much exercise, often gives rise to a necessity for sounding in order to determine the question. Indeed I know of no other complaint which so strongly resembles by its symptoms stone in the bladder in a mild form, as it is occasionally observed when the foreign body is small and produces little irritation."

"Further inquiry will frequently discover that the patient has little or no sexual desire, and he may or may not be the subject of frequent involuntary seminal emissions during sleep. The health is mostly somewhat impaired, and general debility complained of."

Keyes ("Diseases of the Genito-Urinary Organs") makes three kinds of prostatitis: (1) parenchymous, (2) follicular, (3) gonorrhœal. His follicular variety corresponds to Thompson's chronic prostatitis. This disease has also been called prostatorrhœa.

I doubt if either variety exists alone, except in rare instances.

Treatment.—The first requisite in acute or chronic cases is absolute rest. The bladder, rectum, and sexual organs must be kept in a quiescent condition. The rectum should be kept empty by enemata of hot water given several times a day. If a small fæcal mass —a scybalum—is left in the rectum it will irritate the prostate and neck of the bladder. If the injections do not wash it out, remove it with the finger. The position should be recumbent, with hips elevated as much as consistent with comfort. This will lessen the desire to urinate and prevent congestion.

To lessen the pain and constant desire to urinate, in addition to our specific medicines we are often obliged to resort to special anodynes, like morphine, opium, belladonna, hyoscyamus, corn-silk, triticum repens, etc. The fluid drank should be alkaline like Vichy or seltzer. A little lithiated potash is excellent in some cases. Infusions of marshmallow, flax-seed, galium, quince seeds, and other mucilaginous drinks should be freely taken. Suppositories made of codeine, hyoscyamus, iodoform, ichthiol, or opium are sometimes required. The medicinal treatment of chronic parenchymous prostatitis should be conducted along the same lines as that of chronic metritis, for the prostate and the uterus are homologous organs. The object

to be attained is to prevent such proliferation of tissues as will lead to hypertrophy, namely, areolar hyperplasia. The most appropriate remedies are ergot, ustilago, thuja, cimicifuga, sabal serrulata, conium, hydrastis, and aurum. Sabal (saw palmetto) is doubtless primarily homeopathic to this form of prostatitis, and should be given in small doses of the 1x or less. Primarily it is a powerful stimulant to all the glands, especially those belonging to the generative system — in this respect resembling aurum; while ergot, hydrastis, and the others act physiologically, depressing undue functional and proliferative activity. The remedies for follicular and gonorrhœal prostatitis belong to another class: those capable of causing in large doses a similar condition. Chief of these are copaiva, sabal, thuja, cubebs, buchu, sandal-wood oil, kava kava, turpentine, mercurius, eucalyptus, cannabis, senecio, etc. Iodide of potassium has been theoretically advised in chronic follicular prostatitis with enlargement, but success has rarely attended its use in large doses. Dr. Freer ("N. A. Jour. of Hom.," 1890, p. 647), however, reports a case attended by spermatorrhœa, in a man aged twenty-four, which he greatly relieved by iodide of potassium, 30th. I may be excused from expressing the opinion that no form of iodine is homeopathic to enlarged glands. If the 30th did any good in the above case, it benefited the follicular inflammation.

Select the medicines carefully according to the symptoms and pathological state; prescribe it in small doses of the crude drug, or 1x to 3x, and continue its use persistently until the symptoms improve, then lessen the dose but do not suspend it, for I do not believe in the rule adopted by some of our school that we should not continue a medicine after improvement sets in. It is not a natural law. If an aggravation should occur, it will then be proper to lessen the dose or suspend it, but not during an improvement. During the treatment of chronic prostatitis all stimulating food and drinks should be avoided, and only moderate exercise indulged in. Horseback or bicycle riding will retard the cure. Equally important is it that the mind should be kept free from sexual thoughts and emotions. Indulgence in intercourse should be forbidden. It keeps up an abnormal congestion of the prostate and contiguous tissues which is inimical to the necessary physiological rest. If sexual excitement is persistent, recourse must be had to appreciable

doses of conium, salix niger, damiana, or one of the bromides. Keyes and Thompson insist on the value of blisters to the perineum, and injections of mild solutions of nitrate silver into the prostatic urethra (five or ten grains to an ounce of water), but I have never had occasion to use such measures, and where I have observed their use in the hands of surgeons the results were not as satisfactory as could be desired.

HYPERTROPHY OF THE PROSTATE.

Under this head I refer to the enlargement which is an accompaniment of age (from fifty to seventy-five years), not the enlargement after inflammation, occuring in youth and middle age. Keyes's description of this condition is clear and less prolix than Thompson's, and is admirably presented. I quote the essential part of his description:

"The morbid condition to which the prostate is most liable is hypertrophy, either general, partial, or by the development of circumscribed tumors. In general hypertrophy the glandular elements, instead of being hypertrophied, often become atrophied by the excessive growth of fibrous and muscular tissue between them. In marked cases they are completely destroyed, and the prostate is converted into a homogeneous fibro-muscular tumor. The isolated circumscribed prostatic tumors, however, always show new formation of gland tissue.

"*Cause.*— The cause of hypertrophy of the prostate is totally unknown. The numerous hypotheses which have been advanced by authors need not be discussed: they do not cover the ground. No known diathesis, or combination of circumstances, can account for the affection. It is not venous stasis, or excessive use of the organ, or sedentary life. All that can be said is, that the disease does not occur before middle age, rarely before fifty — Thompson says fifty-five.

"The prostate is analogous to the uterus in the female in regard to the nature of the muscular tissue which composes it, and this analogy is further borne out by the tendency of both organs to develop fibrous tumors (so-called) after middle life. Velpeau suggested this analogy, and justly. The portion of prostatic tissue which hypertrophies is the muscular, and not the glandular (or only

to a small extent); and although general or partial enlargements of the prostate are the rule, yet it is rather rare for any considerable hypertrophy of the organ to be found without the coexistence of one or more circumscribed tumors, which correspond to the circumscribed fibrous tumors of the uterus, also composed mainly of unstriped muscles. Bayle says that twenty per cent of women, after thirty-five, have fibrous tumors of the uterus, the cause, of course, unknown. Thompson says that thirty per cent of males, after fifty, have fibrous tumors of the prostate. He states that moderate enlargement of the prostate may be expected in one out of three men; after fifty, marked enlargement in one out of every eight, but rarely before sixty. Thompson believes that the affection rarely commences after seventy. He quoted, from Beith, the case of an old man who died at one hundred and three, where the only abnormal conditions found were hypertrophy of the prostate and a sacculated bladder." (Keyes.)

Size and Shape.— No positive limit in size can be named. The prostate may be encountered of the size of a man's fist. Thompson has seen the transverse diameter exceed four and a half inches. The weight of twelve ounces has been reached. This excessive amount of enlargement, however, is rare — a prostate as large as a small orange being infrequent.

"The portion most frequently involved, either alone or (usually) associated with more or less general hypertrophy, is the posterior median part, known since Sir Everard Home as the third lobe. This nomenclature, however, is inexact. The prostate has no third lobe, and what Home, from his dissection of diseased prostates, named the 'third lobe' is really a pathological formation, and is now more correctly styled median centric hypertrophy. It consists of that triangular part of the prostate lying between the ejaculary ducts, and overgrowth in this situation is believed to be due to the absence of capsule here. It may be found with little or no enlargement elsewhere. In form it is usually an oval, rounded tumor (there may be two or more), which grows up from the floor of the back part of the prostatic urethra and juts out posteriorly into the cavity of the bladder. It may reach the size of a small pear, and indeed resemble a pear in shape, showing a tendency to pedunculation.

"When hypertrophy invades the lateral lobes, only one may be

affected, but usually both, more or less general enlargement corresponding with the local overgrowth. Under these circumstances the pyriform central tumor tends to fill up the internal orifice of the urethra, leaving a passage on either side along its floor for the urine. The mucous membrane on either side of the central mass is often drawn up between it and the hypertrophied lateral lobes, forming a crescentic bar at the neck of the bladder.

Imbedded in the hypertrophied mass, it is usual to find several small circumscribed tumors, dense, hard, seemingly fibrous in character, easily enucleated and elastic, so that, when cut through in a clean section of the organ, the cut surface of the tumor overrides the general smooth plane of the incision, as if the little mass had previously been compressed. They are formed of unstriped muscle with some new glanular tissue, and are considered analogous to mammary glandular tumors, or to glandular bodies which develop (pathologically) in and around the thyroid. These tumors, usually small, may become as large as a marble; many are found of the size of a pea." (Keyes.)

The central median hypertrophy mentioned by Keyes and Thompson is the cause of nearly all the unpleasant symptoms. There is also, in many cases, a hypertrophy of the mucous membrane just behind the prostate, which forms a "bar" and interferes with the passage of urine from the bladder to the urethra. This obstruction does not merely cause difficult and painful urination but inevitably leads to disease of the bladder. The bladder is never completely emptied. The muscular fibres of the bladder are not able to contract sufficiently to bring the floor of that viscus above the level of the dam at its mouth. This residual urine causes no symptoms at the time. It becomes mingled with fresh supplies of urine coming down from the ureters. After a time, however, mucus from the congested membrane around the base of the bladder, being partly retained in the residuum, acts upon the latter, setting up decomposition of urea and liberating carbonate of ammonia, which irritates still further the mucosa of the bladder, until there obtains a complete pathological picture of chronic catarrh of the bladder which has been described on previous pages. Not only does it cause catarrh of the bladder but the prostatic obstruction causes structural changes in the bladder walls. The muscular tissues hypertrophy, the walls

are thickened, the contractions are powerful, and great irritability is present. In other cases the bladder becomes dilated, sacculi form, and an atonic state of the viscus obtains in which the power to expel the urine is nearly or altogether lost. In many cases there is an extension of the mucous inflammation from the base of the bladder upward until the ureters and kidneys are seriously affected.

Dr. Keyes gives such a graphic description of typical cases and the course of its symptoms that I quote it entire:

"*Course and Symptoms.*—During all the time that these pathological changes have been going on, a period of many months, perhaps years, ever since there began to be a little hyperæmia around its neck, the bladder has been getting gradually irritable. The patient does not readily notice it, and will never be able to fix a precise date for the commencement of his troubles. An old man does not sleep soundly or pay the strictest attention to the performance of his habitual functions, and he so gradually acquires the habit of getting up a little earlier than usual in the morning to empty his bladder, that he pays no attention to it. Soon he finds that he wakes up once at night, perhaps twice, with a feeling of fullness in the bladder. He passes water, and goes to sleep again. He is also troubled a little more frequently than usual in the daytime, but he looks upon it as a condition natural to advancing life. He has learned that the little ills of the flesh, if let alone, usually regulate themselves. He has passed water without trouble for fifty or sixty years, and he thinks that he ought still to be able to manage it without applying to his surgeon. He shrinks from acknowledging a weakness, which he must admit to be, if nothing more, a symptom of advancing age, and so he goes on lulled to security, making water at intervals which gradually but steadily become shorter, getting up perhaps every hour at night, and constantly annoyed by a faint, obscure sense of weight and heaviness about the lower part of his belly, with, perhaps, a fullness in the rectum, and a dull pain behind the pubes. The bladder now is never empty; but the patient does not know it. Only an excess above a certain residuum can be passed off. The old man notices, also, perhaps, that he has to wait a little while before the urine begins to flow, that the stream is small, and is not projected away from him with any force, and that perhaps a part of the urine dribbles down perpendicularly from the meatus, while the rest flows

as a continuous stream. Possibly he cannot make the 'coup de piston,' the final spasmodic clearing of the urethra, and finds that a few drops dribble away upon his clothes after each urinary act. He does not experience quite as much ease and relief as usual after micturition; but this has come on so gradually that he disregards it. He finds, however, when he has jolted through the streets in a carriage or car, that his calls to urinate are even more frequent than usual.

"At this juncture he dines out, and drinks a glass or two of wine more than usual, or he neglects a call to urinate, or gets a wetting, or his feet or legs get chilled (the latter a very common cause of trouble), and suddenly he finds that he cannot pass water at all. After vainly trying at intervals for a number of hours, if he does not seek surgical relief, at last the urine will begin to dribble away from him. The bladder has been distended to its utmost, the mouth of the urethra has been dragged open slightly, and the excess of urine trickles involuntarily away. This is overflow and not incontinence. Meantime the patient has been suffering the torments known only to those who have had retention, and he hails the overflow with delight, believing that his sufferings are about to cease. The hope is vain. The congestion of the bladder-neck, brought on by the use of liquor, or by the chilling, and which, added to the already large prostate, has swollen it sufficiently to shut up the urethra entirely, subsides shortly. Gravity, and the contractions of the abdominal muscles and of the diaphragm, are together able to dispose of a certain excess of urine, which the overstretched bladder, now in a condition of atony, is unable to void. The patient, perhaps, recovers from his overflow, but his residuum is greatly in excess of what it was before his attack of retention, his calls to urinate are more frequent, he is disturbed more often at night. All his former feelings of uneasiness and pain about the hypogastrium and perineum are increased; digestion is impaired; the appetite fails; and, worn out by loss of sleep, inability to eat, and constant uneasiness amounting to actual pain, the sufferer runs down, aging rapidly, and becoming fretful and irritable, losing all interest in business, and nearly all pleasure in life."

Treatment.—The management of enlarged prostate may be divided into three methods: (1) surgical, (2) mechanical, (3) medicinal.

Of the first I shall not write, but refer the reader to standard works on surgery and especially the writings of Drs. Keyes and Helmuth.

The mechanical treatment refers to the use of the catheter, which, after the enlargement has reached a certain degree, is essential and most important. Sir Henry Thompson and Keyes give the most explicit and practical directions for the use of the various forms of catheters. I will only add that I advise those who have not had a large experience with the catheter to begin with the soft rubber or velvet catheter. It will answer the purpose in all cases except when there exists a "bar" or "dam" at the neck of the bladder, in which case Mercier's and similar catheters are the best instruments. While I advise that the catheter should be used as soon as it becomes actually necessary, I believe it is often resorted to before a real necessity for it exists. For instance, a man with enlarged prostate catches cold, or drinks too much wine or whisky. He finds that, owing to a congestion of the prostate and an irritability of the neck of the bladder, he cannot micturate. He applies to a physician, who introduces a catheter. It is the first time it has been introduced perhaps. The bladder is emptied, but the catheter has caused some irritation and has to be used again, and such is the tendency of the bladder to take upon itself a habit that it becomes necessary to use it regularly. Now if the man had taken a hot hip-bath or a hot enema, drank some alkaline water and been given nux vomica, cantharides, cannabis, or hyoscyamus, the power of micturition would have been restored in a few hours without the use of the catheter.

When a man with an enlarging prostate first finds a difficulty in starting the flow of urine his first impulse is to strain. If there is no bar or dam, nor any spasm of the cut-off muscles, he is able by the straining effort to force the urine out of the bladder. But if either of the above obstructions exist, his straining will only increase the difficulty. The bladder will force the bar or dam against the vesical outlet and the urine cannot pass it. Patients should be instructed never to strain when urinating. Instruct him to grasp the penis, just behind the glans, with the thumb and forefinger, or with the whole hand, to compress the urethra and wait until he feels the urine filling the urethra to the point of painfulness; then to let go. He will find the stream of urine will be large, and will be pro-

jected a considerable distance. This may have to be repeated until the bladder is emptied, but sometimes one compression will so open the vesical orifice that micturition will go on easily to the end. The explanation of this is, that by compressing the urethra, the urine after filling it, backs up against the valve-like dam or bar and pushes it open, allowing the urine to pass over it and out of the bladder. By following this plan intelligently a man may be saved from using the catheter for many years. If the obstruction be a spasm of the cut-off muscles, this method is not so certain. In such case advantage should be taken of the relaxing effect of warm enemata or the sound of running water from a faucet or a pitcher. The introduction of the faucet in public urinals has been a great boon to patients of both sexes who have irritable cut-off muscles. I have observed, also, that many persons find it difficult to micturate until they have drank a little water. Sometimes merely rinsing the mouth with any fluid will relax the cut-off muscles. In some severe cases, especially in women, a few whiffs of chloroform or amyl nitrite will have a very happy effect.

The state of the rectum has much to do with the ability to micturate. Many cannot urinate until they have a movement of the bowels in the morning or empty the rectum with enemas or with the finger. The fæcal mass presses on the prostate or forces the dam against the vesical opening; or the pressure may irritate the neck, causing spasm.

I have known large and small hardened masses to cause frequent and scanty micturition without relief. Remove the scybala and the bladder will empty itself.

Hemorrhoidal tumors, internal or external, greatly aggravate the dysuria in prostatic enlargement. They should be removed or reduced in size by some means. The influence of the knee-elbow position for five to ten minutes when the rectum is empty will drain the turgid veins and allow protruded piles to go back. Then it will be found that micturition will be easier.

Medicinal Treatment.—The dominant school have but little confidence in the powers of drugs to reduce the size of true hypertrophy of the prostate. The late Dr. Atler, of Philadelphia, believed that ergot has some specific influence because it caused unstriped muscles to contract. He argued from this that "it is calculated not only

to contract the muscular fibres of the prostate, but also primarily the capillary vessels, and secondarily, as a consequence of muscular contraction, its follicles and mucous glands, and thus the size as well as the nutrition of the glands would be diminished." He claimed to have seen the prostate decrease in size under the use of ergot. Sir Henry Thompson does not mention ergot as a remedy. Keyes says:

"The radical treatment of enlarged prostate by medicine is in my opinion a delusion. The cases recorded prove nothing. Many a man has enlarged prostate and retention and uses a catheter for a longer or shorter period, and then under milk diet or improved health he recovers his expulsive power and abandons his catheter. I have several instances of this among my patients, none of whom took ergot, while I have given ergot in large and small doses to scores of people for months at a time, and have yet to see the first case that derived any advantage from the drug that I could appreciate. The same is my opinion of the interstitial injection of ergot or iodine into the prostate."

Thompson is of the same opinion as to medicinal treatment. He writes:

"I fear it must be acknowledged that no therapeutical agent is known which has the power of reducing an actual hypertrophy of the prostate."

Dr. Bessey, of Toronto, Canada, in an excellent article on the surgical and medicinal treatment of enlarged prostate ("Hahnemannian Monthly," 1892, p. 225) mentions ergot favorably. After quoting Atlee, he says: "As ergot is well known to be spasmodic in its action, and therefore only temporary in its effects, and as cohosh or cimicifuga possesses the power of producing tonic or permanent contraction of involuntary muscle fibre, it suggested itself to my mind as the drug necessary to complete the good effects of the ergot in such cases, and I have been more than pleased with the results. My experience with these two agents has gone to show that they will accomplish the desired results, not only with mere hypertrophy of the gland, but also in enlargement from myomatous growth, as in fibroid tumors of the uterus. By the combination of the cohosh the weakness of the sphincter and muscular walls of the bladder is greatly lessened, and the power of the bladder to expel its contents

greatly augmented at the same time that the mechanical obstruction to catheterism is removed by the lessening of the size of the organ. My experience with the use of ergot alone was not completely satisfactory, as the symptoms after a time returned; but since using the combination of the two drugs, ergot and cohosh, I have had no complaints, and the number of old men who have been able to drop the use of the catheter, after having been constantly dependent upon its frequent use for years, has been surprising, while the expressions of their gratitude is music to our ears."

Dr. Bessey's use of cimicifuga in enlarged prostate is new. It is selected by him purely upon physiological data, it having no symptoms to indicate it for this disease. It is said that thuja has the power of causing permanent contraction of involuntary muscular fibre. It has been used with apparent success in many cases of enlargement especially occurring after gonorrhœa.

Lilienthal ("Therapeutics") recommends for this condition aloe, cannabis, mercurius, nitric acid, pulsatilla, sulphur, and thuja. These are not homeopathic to the hypertrophy of old age, although they may be in the inflammatory enlargement occurring in young persons. Iodine has its advocates, but was most used when the prostate was supposed to be mainly a glanular organ. Dr. Safford, of London, recommended it in an "Essay on Diseases of the Prostate," and claimed to have cured eleven cases. But Sir Henry Thompson criticises these claims and finds them unwarranted.

Lippe's recommendation of digitalis because it has some symptom of irritable bladder is not worthy serious consideration. A drug may have every symptom of a typical case of senile hypertrophy and be of no value in the treatment.

Ustilago ought to be of value if ergot is. If, as it is claimed, hydrastis contracts blood-vessels leading to and in the uterus, and thus arrests the growth of fibroid tumors, then it ought to have a decided influence in reducing the size of those irregular nodulated prostates which contain fibroids.

Conutine and hydrastinine are much more powerful than the crude drugs, and can be used effectually in smaller doses; they might be advantageously injected into the substance of the prostate. I would advise the use of ergot, ustilago, hydrastis, and cimicifuga, by means of rectal suppositories containing a few grains of the solid

extracts, and introduced at night. Sabal serrulata (saw palmetto) has within a few years been so highly praised and fulsomely advertised as a specific for enlarged prostate that it is time some serious inquiry should be made relating to its real value. My opinion is that it has no value in reducing the size of hypertrophied senile prostate. It has no physiological action that we know of upon muscular tissue, striated or unstriated. It does stimulate, especially the generative glandular structures, and in massive doses may cause inflammation in such structures. Judging from its action in pharyngitis and other glandular mucous surfaces, I believe it capable of causing and curing mucous cystitis and urethrititis. It may have a specific affinity for the glandular elements of the prostate, the seminal vesicles, and the prostatic urethra. The reported cures seem to prove that here is its sphere of action. This would make it valuable in acute, sub-acute, and chronic prostatitis with their attendant symptoms — a wide and useful sphere of action. I must caution against its use in large doses in all irritable or inflammatory conditions. It is only in atonic and torpid conditions of the genito-urinary organs that physiological doses are admissible. I do not know that muriate of barium has ever been used in hypertrophy of the prostate. Its curative power in various forms of sclerosis would warrant a trial in enlargement with sclerosis of that organ.

In connection with any treatment adopted to reduce the size of the prostrate we should carefully select remedies for the reflex symptoms which arise from time to time. These symptoms are singularly like the reflex symptoms which affect women who suffer from uterine disease and are generally relieved by the same remedies.

When that condition known as catarrh of the bladder obtains, it must be treated topically and constitutionally according to the rules laid down in the treatment of that affection.

Varicosis of the bladder and contiguous organs is nearly always present to a considerable degree in all cases of enlarged prostate. This condition adds greatly to the sufferings of the patient. It is possible to relieve this condition to some degree by the use of hamamelis, collinsonia, carduus, and electricity.

Dr. William Harvey King, of New York, in a very scientific and candid paper in the "Hahnemannian Monthly," 1892, writing of the value of electricity in enlarged prostate, says: "In order for us

to understand the condition which we are to relieve by this treatment, it is necessary to take a look at the pathology of the disease. When we bear in mind that the blood returning from the vesical veins has to pass through the plexus surrounding the prostate on its return to the general circulation, we can easily see how any enlargement of that organ is liable to obstruct the venous circulation, and thus cause a venous congestion of the bladder-walls and membrane.

"This venous congestion, together with the obstruction of the free flow of urine, thus causing greater labor for the bladder-wall, at first causes slight hypertrophy of the muscular fibre of that organ. This hypertrophy, however, never entirely compensates for the obstruction, and soon the walls of the bladder are in a state of atrophy. As a consequence of this, mucus is thrown off, which makes the obstruction still more complete."

"Finally the bladder is incapable of completely emptying itself. A sediment is left, the carbonate of ammonia is liberated, setting up a cystitis which, if the inflammation is allowed to go on, will follow up the ureters and produce a pyelitis. During all this time retention is usually a marked symptom.

"Now, the treatment which we are giving (the galvanic current), if administered in the early stages, while it does not remove the enlarged prostate, stimulates the walls of the veins, improving the circulation and removing the venous congestion of the bladder. It also stimulates the atonic bladder-walls, so that it can overcome to a great degree the obstruction, thus leaving less residual urine and lessening the liability of general cystitis. I have seen this treatment alone in the early stages of an hypertrophical prostate reduce the mucus so that it was only noticeable by carefully looking for it when, before the treatment, it left deposits covering the entire bottom of a chamber, and it also decreased the frequency of urination from one to three hours."

I refer the reader to this article for the explicit direction for using the galvanic current.

ATROPHY OF THE PROSTATE.

It seems to me that medical writers dismiss this disease with too much indifference. The following from Keyes will show how it is generally mentioned:

"Atrophy of the prostate is rare, but it is occasionally encountered. Among the recognized causes may be mentioned the atrophy of old age, coinciding with general atrophy of the rest of the body. Here the glandular rather than the muscular constituent disappears. Thompson, in his admirable monograph, which obtained the Jacksonian prize in 1860, has, by laborious investigations, established the fact that the prostate does not necessarily atrophy. As a rule, it continues about the normal size, but it may occasionally atrophy, physiologically, like other structures in old age, just as it may, and often does (pathologically), hypertrophy.

"Atrophy of the prostate, during general wasting diseases, especially phthisis, has been noted. Pressure from a tumor, or cyst, or stone, within or near the prostate, may cause its atrophy, as may also the constant pressure of urine behind a tight stricture. Atrophy, after double castration, is possible. Atrophy of the prostate has no symptoms except, possibly, lack of force in the ejection of semen. It is an unimportant affection, and has no direct treatment. If the cause can be discovered and removed (pressure), the tendency to atrophy may be overcome."

Treatment.— While admitting that true senile atrophy of the glandular elements is incurable, *i. e.*, that they cannot be restored, it may be possible that the natural physiological stimuli of those elements, if properly applied, might ward off premature atrophy or at least retard it. After exhausting diseases both the muscular and glandular elements tend to atrophy. Here the same natural stimuli may be of value. Electricity ought to be of value if applied by an expert.

Of the medicinal stimuli of the glandular elements — aurum, kava kava, eryngium aquaticum, phosphorus, damiana, sabal serrulata, and thuja are the most useful. They should be used in small but material doses, not enough to cause unnatural excitement, or secondary effects.

Those drugs which will depress the functions of the glandular elements are primarily homeopathic to atrophy. Conium, caladium, salix niger, lycopodium, nuphar, agnus castus, barium, and a few others are primarily indicated in minute doses.

If atrophy of the muscular elements result from exhausting diseases, I do not see why the general nutritive-reconstructive remedies

should not restore its size. Sir Henry Thompson says: "What is the precise physiological action by which atrophy is determined? Is it some active process of absorption, removing the constructive elements of the prostate, in the same manner, but more rapidly, than that ordinary process which results from the effete tissues throughout the whole body, in order that they may be, as constantly and gradually, replaced by new material? I think not, but believe it to be rather the result of failing power on the part of the body to replace, by new material, the effete tissues removed by the natural process of absorption. It is not that the process of degradation is much more rapid, but that the powers of supply and reformation are less vigorous than heretofore. When the resources of the body are inadequate to supply the plastic material and the formative power, in an equal ratio with the expenditure, general atrophy must result."

In such a condition described above, in addition to good food, pure air, and judicious exercise, I would advise the organic hypophosphites (lime and soda) with iron, strychnine, and saw palmetto; or phosphoric acid with hydrastis. These restoratives of the tone of the nervous and assimilative organs ought to bring back to a normal condition a recent atrophy of both structural elements of the prostate. Phospho-albumen ought to be tried.

Dr. W. H. King, in the "Hahnemannian Monthly," 1892, gives the following case, which probably was due to atrophy, in which electricity appeared to cure. "Atrophy of the prostate," he observes, "is a very rare disease and one which I am not sure that I have ever treated. When we come to consider that the prostate is principally a muscle, the glandular portion only occupying an insignificant part, and that this muscular tissue is in structure analogous to the muscular tissue of the uterus, we might, considering the number of cases of atrophy of the uterus that have been improved by the use of electricity, conclude that benefit would occur for a similar condition in the prostate, providing, of course, that the cause of the atrophy is removed. Some years ago I treated a case which was diagnosed by a physician other than myself as atrophy of the prostate. The patient was a man of about forty years of age, and had had stone in the bladder which had been crushed by a lithotrite. Sometime before the operation he noticed, in having sexual intercourse, that the semen would not come out in jets as it had formerly done, but would drib-

ble out and continue after he had withdrawn. After the operation with the lithotrite it was found that this condition did not improve as it was thought it would, and the diagnosis of atrophy of the prostate was made and the patient sent to me for electrical treatment. He was given three treatments a week, varying from ten to fifteen minutes in duration. The faradic battery was used. One electrode was introduced into the rectum and carried up to the prostate, the other, a flexible hand-electrode, was pressed well forward on the perineum. The patient showed signs of improvement after the second week's treatment, and in nine weeks he had recovered to such an extent that the semen was all ejected before the penis was withdrawn. He considered himself cured and discontinued treatment. This case occurred in the early years of my practice, and I did not doubt at the time that I had in twenty-seven treatments cured a case of atrophy of the prostate gland; but from examination made at the time, and with more mature experience, I now have doubts regarding the accuracy of the diagnosis; but still it might have been a case of atrophy of the prostate."

CHAPTER VIII.

DISEASES OF THE CIRCULATORY SYSTEM.

It is not my intention to write a complete section on the diseases of the heart. I refer the reader to my "Lectures on Diseases of the Heart," the last edition of which has lately been published. I shall content myself with some general observations on inflammations of that organ and their treatment; several chapters on the pulse; and some of the more important diseases of the great blood-vessels. Within a few years our knowledge of the pathology of diseases of the heart and circulatory system has changed and greatly advanced, and the chief motive of the following articles is to present the newest investigations and their influence on the treatment of cardiac affections.

INFLAMMATIONS OF THE HEART.

(1) Pericarditis; (2) Endocarditis; (3) Myocarditis.

I have grouped all three of the above inflammatory diseases of the heart together, for the reason that they generally have a common cause and their essential treatment is the same.

Idiopathic inflammations of the heart are very rare (Metchkinoff says there is no such condition as idiopathic inflammation); they are usually secondary to four diseases, which I will name in the order of their importance: (1) Rheumatism, (2) Bright's disease, (3) scarlet fever, (4) chorea. It is the generally accepted belief that rheumatism is the cause of the majority of all cardiac inflammations. It must be understood that they are not due to a metastasis of rheumatic inflammations, because they often appear before any joint or other tissue is affected. Endocarditis and the others are often essentially rheumatic; they are a part of that general blood contamination which we call the rheumatic state.

Bright's disease, while often a consequence, as often causes inflammation of the heart, because it originates septic poisons which are carried by the blood to the heart and irritate its tissue-cells, until inflammation — which is an effort to rid the tissues of poisonous matters — sets in and produces degenerative changes.

Scarlet fever causes cardiac inflammations in the same manner.

Chorea is supposed to be intimately connected with endocarditis, but this connection has never been fully explained. The essential cause of chorea may be in the central nervous system, and so may the endocarditis and myocarditis which often accompany it; or it may be of microbic origin.

The treatment of these inflammations should not be altogether symptomatic. If we follow such a line we shall fail to arrest the destructive processes. We must combat the poison which exists in the blood and tissues, and if possible prevent their formation and deposition.

If the cause of the inflammation is the rheumatic poison (uric acid), the alkalies must be used for the purpose of rendering the blood so alkaline that the urates will not be deposited in the tissues of the heart, causing those vegetations on the valves which interfere with their normal action. Small doses of the acetate, nitrate, or lithate of potassium seem the best adapted to this condition. To these chemical agents we can add such medicines as bryonia, colchicum, cimicifuga, manaca, rhus tox., and others. Then there are agents like salicylate of sodium, salicin, salol, and salophen, which seem to have a double action, partly chemical and partly medicinal. It should be remembered, however, that all these agents in large doses tend to weaken the muscular structure of the heart, which is a result to be avoided. The use of these drugs in massive doses by the old school is pernicious and unnecessary. Instead of giving the salts of potassium, the salicylates, etc., in twenty or thirty-grain doses, give them in doses of one-tenth or one grain frequently repeated, and we shall get their beneficial effects only. The same can be said of the use of the vegetable medicines above mentioned. Small doses of bryonia and the others do much better service than large ones. When there is high fever, with increased and too powerful action of the heart, aconite, veratrum viride, and colchicum in small doses (1x, in one to five-drop doses) frequently repeated will soon subdue

the abnormal action and reduce the temperature. The use of the so-called antipyretics, such as antipyrin, is injurious and unnecessary. The injury done by high temperature has been greatly exaggerated. Drugs may reduce the heat of the body, but they do it at the expense of the vitality of the muscular structure of the heart. The use of cold water or ice over the heart is utterly without reason, as much so as copious blood-letting. The action of aconite and veratrum viride in inflammation or hyperpyexia is in no sense homeopathic. They cannot cause either; their action is physiological and mechanical; as much so as putting the brakes to the wheels of a carriage or railroad coaches. Bryonia, spigelia, and colchicum do act homeopathically in such cases because they are capable of causing carditis.

As soon as we find that the above medicines are slowing the action of the heart, and lowering its impulse to near the normal, they should be suspended, for on no account should we weaken the impulse of the heart below its normal, for if we do we retard the process of compensation — nature's method of repairing the injury.

The primary action of all the above mentioned agents is to weaken the heart. They are therefore homeopathic to that condition. But I have never been confident that they will restore a weak heart to its normal strength. It seems to me that here, again, we must resort to physiological remedies. It is a delicate question, and requires good diagnostic acumen to decide just when to commence the use of digitalis, convallaria, cactus, or strychnine. If we use them too soon we tire out the heart by over-stimulation. We should wait until the soft compressible pulse, irregular or intermittent, the weak impulse of the heart, and the general loss of normal tension in the arteries, with fullness of the venous system, show that the heart's action is failing in force. When this occurs do not hesitate to give digitalis and nux vomica, or digitalis and strychnine, or cactus with strychnine, until we are convinced that we have arrested the tendency to cardiac failure. The doses of all the above except strychnine should be from one to five drops of the tincture or 1x every four or six hours; of strychnine the 100th or 50th of a grain at the same intervals. This is a general rule and can be modified according to the age, susceptibility, or idiosyncrasy of the individual patient. Bryonia, manaca, spigelia, rhus tox., cimicifuga, or cactus, for the inflam-

mation, should be selected from the subjective symptoms which they cause when given in health, and not from objective or general indications.

CHRONIC VALVULAR DISEASE.

I shall give only a brief general statement of valvular diseases and a definition of each, with the general principle of their treatment. In my "Lectures on Diseases of the Heart" will be found their complete etiology and diagnosis.

At a late meeting of the British Medical Association Dr. David Drummond, one of its most eminent members, speaking of the causation of cardiac diseases, says:

"The study of cardiac lesions throws into relief the importance of tracing diseases to their true causes. They are all referable to primary conditions—rheumatism, gout, specific fevers, tuberculosis, sepsis, alcoholic excess, syphilis, etc., which are singularly fruitful in morbid products. These conditions constitute a formidable list, to which we are constantly adding, and each is responsible for heart affections having more or less characteristic, clinical, and pathological features. The immense importance of investigating cardiac diseases upon the basis of their antecedent and underlying morbid states cannot be over-estimated, for the treatment and prognosis depend largely upon the particular agent at work. It has been the habit of our schools to attach too much value to the diagnosis of the particular valve-lesion, and too little to its cause. Thus, for example, we content ourselves with the shallow and often unimportant observation that this or that case is one of mitral regurgitation or double aortic disease, forgetful that what is of paramount importance is not only the primary reason for the existence of the lesion, but also the cause upon which the symptoms belonging to any subsequent attack of cardiac failure may depend. Thus the inquiry would necessarily embrace the questions in the case of toxæmic lesions, gouty, rheumatic, alcoholic, etc., is the poison still circulating? and what is the prospect of its return? Difficult, and at present more or less problematical, are these questions, but to them we must direct our attention before we can hope to prognose and treat heart disease successfully. Would a substantial reduction in the number of chronic heart cases, as the

result of the recognition of the fact that many are due to curable and preventable causes which an early and successful treatment might reasonably be expected to subdue, be a dream too visionary for us to indulge in? I think not; but assuredly until we fully appreciate the causes, a dream it will remain."

This reads as if it might have been written by Samuel Hahnemann. It will remind the reader of his teachings in the "Organon," and his directions for examining the patient. He taught the importance of investigating the remote and underlying causes of organic diseases, which we will do well not to forget.

AORTIC INCOMPETENCY.

This is the best defined and most easily discovered of all the valvular lesions. It is commonly designated as Corrigan's disease, named after the distinguished physician who first carefully studied it. Incompetency of the aortic valves arises either from inability of the valve segments to close an abnormally large orifice, or from disease of the ligaments of the valves themselves. These pathological conditions may be caused by congenital malformation, a fusion of the two segments, acute endocarditis, a sclerosis of the segments resulting in a curling of the edge which lessens the working surface of the valves, or insufficiency may be induced by rupture of a segment from excessive strain during heavy lifting. The direct effect of aortic insufficiency is the regurgitation of blood from the artery into the ventricle, causing an over-distention of that cavity and a reduction of the blood column, *i. e.*, a relative anæmia of the arterial tree. Dilatation of the ventricle occurs, and finally hypertrophy. In this way the valve defect is compensated, and a larger amount of blood is propelled into the arterial system. When this occurs the regurgitation of a certain amount of blood during diastole does not for a time seriously impair the nutrition of the peripheral part. In this valve lesion dilatation and hypertrophy attain their extreme limit. The enlarged heart may reach the enormous weight of over forty ounces.

Diagnosis and Symptoms.— Inspection shows a wide and forcible area of cardiac impulse, with the apex beat in the sixth or seventh interspace, and as far out as the anterior axillary line. A

thrill, diastolic in tone, is often felt. The impulse is strong and heaving, except in extreme dilatation, when it is wavy and indefinite. Percussion shows a greater increase in the area of heart dullness than is followed in any other valvular lesion. On auscultation a murmur is heard during diastole in the second right interspace, extending with intensity downward towards the ensiform cartilage. This sound is a soft, long-drawn-out bruit, and is of all cardiac murmurs the most reliable. This sound is, however, often regarded as indicating stenosis, whereas in aortic insufficiency there is no material narrowing, the murmur being produced by a roughening of the segments. An examination of the arteries in this lesion is of great importance, as visible pulsations of the peripheral vessels is more commonly seen in aortic insufficiency than in any other condition. The carotids may be seen to throb forcibly, the temporals to dilate, and the brachials and radials to expand with each heart-beat; with the opthalmoscope the retinal arteries are seen to pulsate. In the throat the throbbing carotids may lead to a diagnosis of aneurism. The abdominal aorta may lift the epigastrium with each systole. Sometimes the face and hands will blush with each systole. The pulse is designated as "water-hammer" or "Corrigan's pulse"; the pulse-wave strikes the finger forcibly with a quick, jerking impulse, and immediately recedes or collapses.

Prognosis.— When compensation occurs it may last for years, the patient may not suffer any inconvenience, and the condition is often found accidentally. So long as the hypertrophy or thickening of the muscles just equalizes the valvular defect there may be no symptoms, and moderately heavy exercise may be taken without discomfort or distress about the heart. Pure aortic insufficiency is consistent with average health, but as soon as the compensation is disturbed by changes in other valves, or sclerosis of the arch or orifice of the coronary arteries, unpleasant symptoms will appear, such as headache, dizziness, flashes of light, faintness on rising quickly, palpitation and cardiac distress on slight exertion, and even pain of a dull, aching character in the region of the heart. The pain, however, may be sharp and radiating, and is transmitted up the neck and down the arms, particularly the left. Attacks of true angina pectoris are more common in this lesion than in any other. As the rupture of compensation increases, more serious symptoms set in, at

first shortness of breath and œdema of the feet, then nocturnal dyspnœa so severe that the patient has to sleep with the head high or sitting in a chair. Cough, hæmoptysis, distressing dreams, hæmaturia, and finally general anasarca with emboli and a sudden ending of life, will close the scene. The mental symptoms are important. Suicidal mania, great irritability of temper, and finally uræmic delirium are often met with.

Treatment.— So long as the patient does not complain of any notable general or local symptoms the treatment need not be medicinal, for no medicine can change the condition of the valve. I know it is claimed by Grauvogl and a few others that spongia, iodine, calcarea, and aurum, in high dilution, may have a curative effect, but I have never verified their claims; yet, as these medicines in minute doses can do no harm there is no objection to their use.

The patient should be warned against severe exercise, or any unusual exertion; also against heavy meals, and the use of alcohol.

When, however, the balance of compensation is lost, medicinal treatment should be commenced. The remedy may be selected according to the law of *similia*, but it must not be forgotten that not only should the symptoms of the drug correspond with those of the patient, but the drug selected should be one possessing a known affinity for the heart. A non-cardiac drug may palliate some reflex symptoms, but does not possess curative value. The medicines which seem to be homeopathic to aortic incompetency are aconite, agaricus, belladonna, glonoine, aurum, baryta, iodine, spongia, and spigelia, used in the 3d dilution and upwards.

The physiological remedies, or those which are most capable of arresting or preventing a failure of compensation, are convallaria, digitalis, adonis, oleander, and sparteine. Some authorities have objected to the use of digitalis in this lesion, but it can be used with great benefit. Osler, whose experience enables him to speak with decision, says: "On theoretical grounds it has been urged that the use of digitalis is not so advantageous in aortic insufficiency, since it prolongs the diastole and leads to greater distension. Practically, however, this need not be considered, as when given with care digitalis is just as serviceable in this as in any other condition associated with progressive dilatation." The fact is that great injury will

result from its use if given while the heart is capable of maintaining the balance of competency. But when the signs of weakening appear, then small doses (fifteen or twenty drops of the 1x or three to five drops of the tincture) every four or six hours will aid in the arrest of the failure. My main objection to digitalis is, that it lessens the calibre of the arteries, and may in that way subject the heart to an over-strain. My practice is to begin with convallaria or coronilla, which do not contract the arteries much, while they give the heart-muscle greater tonicity. The dose of both varies from ten drops of the 1x to ten of the tincture every three or six hours. Cactus is too much like digitalis to be used in large doses, but the dilutions are valuable as a palliative to many symptoms, especially to the angina pectoris which so often attends this lesion.

Jamaica dogwood (piscidia) is often very useful for symptoms simulating angina pectoris; a single dose of twenty to thirty drops of the tincture; or 1x frequently repeated.

For the relief of the mental symptoms, aurum and hyoscyamus are invaluable. (I value hyoscine hydrobromate higher than the tincture. Its calming influence over the brain is superior to any other drug when given in doses of a grain or two of the 3x).

In no valvular lesion is bodily and mental rest so useful to restore broken compensation.

AORTIC STENOSIS.

In stenosis there is more or less narrowing or stricture of the aortic orifice, which may be caused by an adhesion between segments so inelastic that they are not pressed back against the aortic walls during the systole. Sometimes the valve segments are thin, sometimes thick and rigid, and have a cartilaginous hardness and present stiff, calcified masses, obstructing the orifice.

Aortic stenosis is not always found to exist alone; in a majority of cases there is some leakage from inefficiency; as in the last mentioned lesion, there occurs a dilatation of the left ventricle, and sometimes forms that lesion called concentric hypertrophy, in which, without much, if any, enlargement of the cavity, the walls are greatly thickened, in contradistinction to the so-called concentric hypertrophy

in which the chamber is greatly dilated as well as hypertrophied. We do not find the same condition of the arteries as in insufficiency, for their walls have not to withstand the impulse of a greatly increased pulse-wave with each systole. On the contrary the amount of blood propelled through the orifice may be smaller than normal; when, however, compensation is fully established the pulse-wave may be of medium volume.

Symptoms.—Auscultation may not reveal any increased area of cardiac impulse. Even when the apex-beat is visible, it may be feeble and indefinite. Palpation may reveal a thrill at the base of the heart in the region of the aorta. This thrill is of greater intensity than in any other condition. Auscultation reveals a systolic murmur of greatest intensity at the aortic cartilage, and extending into the great vessels, but this murmur does not always mean a stenosis, but may be caused by roughening of the valves or the surface of the aorta, or it may be hæmic. When the compensation is complete the murmur is harsh and loud; when it fails the murmur is soft and distant.

Diagnosis.—When we find an intensely rough or musical murmur of greatest intensity at the aortic region, with signs of enlargement of the left ventricle, a thrill, and a hard slow pulse of moderate volume and fairly good tension, aortic stenosis is probably present.

Treatment.—The principal medicines indicated in this condition before compensation has obtained, and after it has begun to fail, are aconite, veratrum album, veratrum viride, iodide of arsenicum, phosphorus, tartar emetic, cactus, nux vomica, arnica, and erythrophleum. If there is undue arterial tension, as there often is in this lesion, we must resort to iodide of potassium, veratrum viride, and glonoine. When the compensation is broken we have the same results as in aortic insufficiency, namely, dropsy, dyspnœa, congestion, and œdema of the lungs, congestion of the kidneys with rapid degeneration; and the same remedies are required for the failing heart and general venous stasis. The dyspnœa in this disease is peculiarly distressing. I have found quebracho to give more relief than any other remedy. In one case a patient was enabled to walk and lie down with comfort when taking a two grain pill of the solid extract three or four times a day. In another case fifteen drops of grindelia robusta every three hours gave great relief.

MITRAL STENOSIS.

This lesion is usually the result of valvular endocarditis. It can occur early in life, and more often in girls than in boys. It is certainly more commonly found in women than men. Rheumatism for some reason occurs more commonly in girls than boys, and inflammation of the mitral valve is the most common lesion in rheumatism. Chorea, according to Bartholow, has an important influence, but whether it is a cause or not has not been fully proven. Osler says that of 110 cases of chorea which he examined two years after the attack, 54 had signs of organic heart disease and 17 had mitral stenosis. Of 25 cases of chorea which I have treated, 23 had signs of mitral disease. I have found it in anæmia and chlorosis, and have known it to result from scarlatina and pertussis.

Stenosis of this valve results from narrowing and thickening of the tissues of the ring or valve-segments. The chordæ tendonæ may become contracted. Cases have been described by Corrigan where the orifice was reduced to a mere chink or slit ("button-hole contraction"). Usually, however, the orifice will admit the tip of the index finger. In mitral stenosis the heart is not greatly enlarged, rarely weighing more than fifteen ounces. The left ventricle is usually small, while the right is enlarged. The secondary alternations are important. The left auricle is dilated and its walls become three or four times as thick as normal. Eventually the right ventricle becomes dilated and hypertrophied.

Symptoms. — In children *inspection* reveals a protrusion of the lower sternum and the fifth and sixth costal cartilages caused by hypertrophy of the left ventricle. The apex is not removed far beyond the nipple, and the chief impulse is over the lower sternum.

Palpation reveals a well-defined thrill in the fourth or fifth interspace within the nipple line. Its quality is rough and grating, and terminates in a sharp, sudden shock synchronous with the impulse. This is a sure indication of mitral stenosis.

Percussion shows an increase of cardiac dullness to the *right* of the sternum and along its left margin.

Auscultation shows a rough vibratory murmur in the mitral area on the inner side of the apex-beat which terminates abruptly in the

first sound. This is a positive indication of mitral narrowing. (For the finer physical signs consult my "Lectures on Diseases of the Heart.") So long as compensation exists persons with this lesion will present no unpleasant symptoms, but when it is broken there will be great shortness of breath on ascending stairs or hills. If a new attack of endocarditis then occurs vegetations may be whipped off into the circulation, blocking a cerebral vessel and causing hemiplegia or aphasia.

Failure of compensation will, according to Broadbent, cause rapid and irregular action of the heart, dyspnœa, pulmonary engorgement, and hæmoptysis. If pneumonia occurs it is generally fatal. Dropsy does not usually occur from mitral stenosis. The liver may become greatly enlarged, and ascites is common. True insufficiency of this valve is very rare, although in stenosis there is occasionally some leaking.

Treatment.—After rheumatic attacks, compensation can be hastened by the use of nux vomica, digitalis, cactus, and rest. When compensation obtains no medicine is needed. The patient must avoid all extreme exertions, wear woolen clothing, and be careful of exposure to cold, damp air. The above medicines are also useful when compensation fails, and they can be aided by other medicines, among which are carduus, euonymin, agaricus, and chelidonium for the enlargement of the liver; phosphorus, lycopus, tartar emetic, and sanguinaria when pulmonary engorgement or hæmoptysis occurs. If ascites sets in, apocynum and digitalis are the best remedies.

TRICUSPID AND PULMONARY VALVE LESION.

These lesions will not be treated of in this work. I refer the reader to the works of Flint and Bramwell, and to my "Lectures on Diseases of the Heart."

HYPERTROPHY AND DILATATION.

As hypertrophy and dilatation are both due to valvular diseases, myocarditis, or arterio-sclerosis, all of which have already been discussed and their treatment outlined, I shall not enter into a further

consideration of them, but refer to the above authorities. Even when caused by heart strain or alcohol, the treatment has been already outlined.

ESSENTIAL PAROXYSMAL TACHYCARDIA.

Definition.— Paroxysms of rapid action of the heart with equally rapid pulse.

As described by Bouveret, of Lyons, France, this affection seems to be a pure neurosis. In his description of the paroxysms Bouveret divides them into two classes, according to their greater or less duration, because of the pathological consequences which ensue if they are prolonged beyond a certain period. If they last more than four or five days, we see secondary disturbances of the circulation and respiration, due to the rapid weakening of the heart, its dilatation, and the incomplete emptying of its cavities.

In the short attack there is nothing noteworthy except the extreme rapidity of the heart's action. This rapidity may attain 250 or even 300 pulsations a minute. It is very like that produced by section of the pneumogastrics in animals. The pulse is usually regular; occasionally there are periods of irregularity. It is often not perceptible at the wrist, but is to be felt in the carotids and femorals. The second pulmonic sound is accentuated, showing increased tension in the pulmonary artery. Sometimes there are prodromata, such as dizziness, or a sense of constriction at the throat or epigastrium. Generally the beginning is sudden, without warning. Often there is no cause for the attack; at other times it follows some strong mental emotion or physical fatigue or effort, and such causes are especially efficient during convalescence from a previous attack. The face is usually very pale throughout the paroxysm. The pupils are normal, and there are, as a rule, no vaso-motor disturbances. There may be moderate dyspnœa; anorexia and constipation are usually present, and almost complete insomnia. There is marked diminution of the urinary secretion, but no albuminuria and no fever. In some cases the temperature is below normal.

The subjective sensations are variable; sometimes epigastric oppression, pain at the præcordia, numbness of the left arm or general chilliness. The attack ends as abruptly as it began, the pulse drop-

ping suddenly from 200 or more to 72 beats a minute. Huppert noted the change of the pulse in his patient from a vague undulation to strong, regular, slow, equal pulsations. The short attack leaves but little prostration afterward. The long paroxysm, however, is much more serious, because of the secondary respiratory and circulatory disturbances. There is extreme cardiac distension, as shown by the dullness. In one case of Bouveret's the dullness extended from the upper border of the third rib to two inches below and outside of the nipple, and from an inch to the right of the sternum to one-half inch beyond the left mammary line. Sometimes there is a soft systolic murmur during the paroxysm or during the convalescence, disappearing later. The stasis in the left ventricle and auricle and pulmonary veins causes congestion and œdema of the lungs. The patient has cough, dyspnœa, and bloody expectoration. Sonorous and sibilant râles and friction sounds are to be heard. In some cases there is pleurisy with effusion. The temperature may rise three or four degrees, owing to the pulmonic process. There is marked cyanosis of lips and cheeks, and swelling and pulsation of the jugulars. There may be agitation and restlessness at night, unpleasant dreams, and even delirium. The cerebral disturbances are probably due to the arterial ischæmia and venous stasis prolonged for several days. Swelling of the liver and spleen are noted, also ascites and œdema of the ankles. The urine is diminished and high-colored, and usually contains albumen and blood-globules. When the attack ceases the urine increases in amount, and the albumen and blood disappear.

In place of constipation there is diarrhœa as a result of the venous stasis in the intestinal mucous membrane. The subjective sensations are usually the same as in short attacks. In one case, toward the end of a paroxysm which had lasted three weeks, and which terminated fatally, the præcordial pain was so intense as to recall that of angina pectoris. Bouveret attributes this pain to the ischæmia of the heart-muscle, due to the same lack of tension in the coronary arteries that is found in the peripheral vessels. Some patients have fainting spells and syncope, especially if they attempt to rise from the recumbent position. At the end of the paroxysm the secondary symptoms disappear gradually. Several days elapse before the lung clears up. The urinary symptoms cease at once. The heart

remains irritable during the first few days of convalescence, and a return of the paroxysm may be produced by a very slight cause, such as sitting up in bed. The extreme cardiac distension, however, disappears in a few hours. The paroxysms ended fatally in eight of the twenty-seven cases, twice by syncope, twice by a systolic collapse, and in the other cases by pulmonary congestion or intestinal hemorrhage.

Etiology.— In discussing the etiology of the disease, Bouveret draws attention to the entire absence of hysteria or neurasthenia in the cases collected by him, nor was there any hereditary neurotic tendency. In most of the other cases reported it is also stated that there was no evidence of nervous predisposition.

Faisan's two cases, however, were those of mother and daughter. My patient was of nervous temperament and had an epileptic son.

The disease is not often observed in children. In Brieger's case the paroxysm began when the patient was nine years old. In the other cases the age at onset varied from nineteen to fifty-two years. The influence of sex is not marked; of twenty-five cases in which the sex is noted, eleven were males and fourteen females. Over-fatigue, either mental or physical, seems to be the chief cause of the affection. Excessive smoking is also an important factor, and the drinking of strong coffee. In Gerhardt's case the attacks came on after long-continued literary work and immoderate smoking. Bouveret's first patient, a professor, was accustomed to read and study late at night, smoking at the same time. He also drank considerable coffee. In one case the paroxysm was caused by a fright two or three days after confinement. In my patient a fright seemed to be the exciting cause. In Sollier's case the attacks occurred whenever the patient, a lacemaker, had been greatly vexed or annoyed in her business.

Pathology.— The pathology of essential paroxysmal tachycardia is still undetermined, and is perhaps not the same in all the cases. The majority of observers believe that we have to do with a pure neurosis, a temporary disturbance of the motor innervation of the heart. Such a disturbance might be caused in three ways: by excitation of the sympathetic, by a modification of the activity of the intra-cardiac ganglia, or by a temporary paresis of the vagus. Dr. Wood considers the tachycardia to be due to a discharge of nerve

force and not to a paralysis of inhibition, comparing it to the epileptic paroxysm, which, he holds, is the result of a discharging lesion, and not a temporary palsy. The tachycardiac paroxysm, in his opinion, is likewise due to a discharging lesion affecting the centres of the accelerator nerve of the heart, the sympathetic.

Nothnagel, on the other hand, employs the same illustration to support the theory of a paresis of the vagus. He sees in the loss of consciousness which accompanies the epileptic convulsion a sudden spontaneous cessation of functional activity on the part of central nervous organs, a sort of torpor or temporary paralysis. In the same manner we can conceive, he thinks, of a temporary torpor of the cardiac centres of the vagus in the medulla. The respiratory and gastric centres are not affected, nor is the trunk of the nerve itself. It has already been stated, in the description of the paroxysms, that there are, as a rule, no vaso-motor symptoms nor changes in the pupils. This fact is opposed to the idea of sympathetic irritation. What part is borne by the intra-cardiac ganglia in the nervous disturbances it is difficult to say. It is not thought that they are ever the primary cause of the attacks. It seems probable, on a review of all the evidence, that in most cases there is paresis of the vagus, of central origin. In three cases there was evidently excitation of the sympathetic, as shown by the accompanying vaso-motor phenomena. It has been proved that only a very strong excitation can overcome the vagus tone, and hence inferred that the sympathetic cannot excite a very rapid action of the heart. The few cases in which it has caused marked tachycardia are to be explained by the fact that the vagus grows exhausted by prolonged sympathetic irritation, so that finally only the cardiac motors are active. The general conclusion is, then, that the affection is a bulbar neurosis, confined to the cardiac centres of the vagus in the medulla.

Dr. Samuel West, however, does not concur in this opinion. While agreeing that the tachycardia is of nervous origin, he believes that the nervous irritability is due to organic disease of the heart, probably of the myocardium. He suggests that there is perhaps a chronic interstitial myocarditis, developing either spontaneously or consequent in some cases on past rheumatic pericarditis, or in others on syphilis, being thus related to fibroid disease of the heart. Let us see how Dr. West's theory is borne out by the four autopsies of

which we have record. I have already stated that the nervous system was normal throughout. In Sollier's case the heart also was pronounced free from disease, but unfortunately the myocardium was not examined. Hence this case is of no value on this point. Bristowe states that in his case, also, the heart was normal in all respects, the muscular tissue included. But the autopsy was made four days after death, and the heart was in advanced state of decomposition. We can hardly, therefore, attach much weight to the evidence yielded by the microscope.

We have left the cases of Brieger and Frœntzel, in both of which a careful examination of all the organs was made soon after death. The records of the autopsies are strikingly alike in the two cases, for in both there was an extensive development of fibrous tissue in the wall of the left ventricle, whereas the valves of the heart were absolutely normal. Brieger attributes the tachycardia in his case to vagus paresis combined with sympathetic irritation, and apparently attaches little importance to the post-mortem appearances. He expressly states that in his opinion the degenerative changes in the heart were of recent date and due to the long-continued irritation of the cardiac muscles. As the paroxysms had existed for twenty-four years in his case, such an explanation is at least plausible.

Frœntzel's patient, however, had suffered from tachycardia for only three months before death, and yet the changes in the heart-muscle were most marked, as will be seen from the following extract from the report of the autopsy: "Left ventricle hypertrophied; increase of connective tissue, thickest next to the endocardium; papillary muscles and trabeculæ in left ventricle very thin and everywhere infiltrated with newly-formed connective tissue; foci or fatty degeneration in the connective tissue formation immediately beneath the endocardium of the ventricular septum; entire endocardium of the left ventricle much thickened; many trabeculæ have undergone fibroid degeneration."

Frœntzel makes no comment whatever upon the findings of the autopsy, but simply states, in concluding his paper, that the pathology of the disease is still very obscure. It seems, then, that interstitial myocarditis was present in the only cases in which the muscular tissue of the heart was properly examined, thus confirming Dr. West's opinion that we should look to the myocardium for the cause

of the nervous irritation. But if it is proved that there is organic heart disease in some cases at least, why need we longer say that the tachycardia is of nervous origin?

Physiology has demonstrated that rhythmical contraction is a property inherent in the myocardium and not absolutely dependent on the nervous system. It is not necessary, therefore, in all cases to appeal to a disturbance of the cardiac ganglia or nerves to explain disturbances of the cardiac rhythm. A simple lesion of the cardiac muscle is capable of producing by itself all the symptoms of disturbed rhythm. We shall see later that the paroxysms in several cases were arrested by pressure upon the cervical pneumogastric. The fact that the intra-cardiac ganglia received and responded to this artificial stimulus is proof of their integrity, in those cases at least. The pathological evidence, as far as it goes, supports the theory that we are dealing with a cardiac and not a nervous disease, but the next autopsy may demolish this theory completely. It may be said also with truth that the clinical picture of the milder forms of tachycardia accords better with the assumption of a neurotic disturbance of the heart than with the presence of so formidable a disease as myocarditis. In some cases the symptoms are absent for years, or may disappear apparently forever. But, in answer to this, we have the authority of Fagge that fibroid diseases of the heart sometimes give rise to no symptoms whatever. Huchard, also, states that sometimes at autopsies extensive disease of the cardiac muscular fibres is found which during life had caused no marked symptoms. In other cases apparently insufficient lesions had caused grave symptoms. These discrepancies he explains by the existence in the heart, as in the brain, of regions that are tolerant or indifferent in regard to destructive lesions, and of other intolerant regions, the latter depending on the importance and the absence of anastomosis with an obliterated artery, and also depending on the function of the affected muscular fibres. The intolerant regions are especially the papillary muscles and the fibres in contact with the ganglia and the interventricular septum particularly, because on it depends the harmonious working of the two ventricles. This explanation of Huchard accords with the post-mortem appearances in Frœntzel's case. For, as you may remember, the papillary muscle and the ventricular septum were both involved in the degenerative process, thus accounting

for the rapidly fatal ending. Perhaps in the milder cases, with infrequent paroxysms, the interstitial growth is situated in the more tolerant regions of the heart-muscle. However, as I have already intimated, two autopsies do not furnish a very secure foundation for a new theory, and it is probably wiser for the present to agree with Frœntzel that the pathology of the affection is still very obscure.

Diagnosis.— A well-marked case of essential paroxysmal tachycardia can hardly be mistaken for any other disease. There is no exophthalmus nor any enlargement of the thyroid; in Graves's disease, also, the acceleration of the heart's action is continuous, and never attains two hundred beats a minute, and the pulse is always perceptible at the wrist. Organic lesions of the vagus cause permanent tachycardia; they are accompanied, too, by respiratory and gastric disturbances. The disease does not last long, being soon fatal. Lesions of the pons or medulla would also give a constant acceleration of the pulse and be attended with motor or sensory disturbances, and very soon cause death. Angina pectoris is excluded by the absence of the intense pain characteristic of that disease. In angina, also, the pulse does not attain such rapidity. Reflex tachycardia is more difficult to exclude, if there are present any gastric, uterine, or ovarian disturbances at the beginning of the paroxysm. In the cases referred to above, the attacks occurred at a time when all the functions of the body were in perfect order. As to whether, in a given case, the symptoms are due to a paralysis of the vagus or to an excitation of the sympathetic, that is, as Frœntzel has said, only a matter of theoretical interest. Nothnagel gives the following points of differential diagnosis: If the pulse rate is very rapid, but the rhythm is even and regular; if the heart impulse is weak, and there are no other symptoms except such as are secondary to incomplete emptying of the heart, and if finally there is noted a paresis of other nerve-tracts running in the vagus, then we may assume a paralysis of the vagus. But when the heart impulse is strong, and the peripheral arteries are well filled and firm, or when there are present other symptoms of irritation on the part of vaso-motor nerve-tracts, then there is evidently an excitation of the excito-motor cardiac nerves.

Frœntzel suggests that in addition to the above rules the effect of our therapeutic measures will also aid in diagnosis. If morphine quiets the attack it must be due to a condition of excitement; but if

there is paresis of the vagus, then digitalis in moderate doses will allay the paroxysm. In many cases, however, both morphine and digitalis are without effect.

Prognosis.—The prognosis of the disease is very doubtful, especially at the beginning of a paroxysm. The unfavorable factors are a tendency to syncope, extensive pulmonary congestion, great præcordial pain, and the unstable condition of the heart at the end of a long attack. Of the twenty-seven cases under consideration, eight died, two or three were apparently cured, and the others remained always liable to attacks, with possible termination in collapse, syncope, or fatal pulmonary congestion. Dr. Wood, however, takes a more hopeful view of the affection. He believes that it has no tendency to shorten life or to develop organic disease. His patient was still living at the age of eighty-seven, though he had been subject to the attacks from his thirty-seventh year. But the disease was evidently of a very mild form in his case, as the paroxysms were of short duration, never exceeding twenty-six hours. We have already seen that the dangerous secondary complications do not develop in such short attacks."

Treatment.—In the treatment of essential paroxysmal tachycardia we have to consider, (1) the management of the paroxysm itself; and (2) that of the intervening periods in order to prevent their recurrence. During the paroxysm the patient should rest in bed or on a lounge—sometimes in a reclining chair, as fainting often occurs. All movement and exciting emotions should be avoided. Because the paroxysms cause nervous patients to be frightened, they should be assured in a decided manner that no danger need be feared if they keep quiet during and for some hours after a paroxysm. It is best not to examine the heart by percussion or with a stethoscope, as it causes the patient anxiety, and often excites or aggravates a paroxysm. The ear can be applied to the chest and will give us all the information we need. The remedy selected should be indicated not only by the subjective symptoms but by the pathology. If the heart is structurally sound, and the cause is purely neurotic, we shall find in aconite, asafœtida, belladonna, aurum, amyl, coffea, castoreum, cannabis indica, cactus, camphor, coca, crocus, glonoine, ignatia, kalmia, lachesis, moschus, nux vomica, pulsatilla, sepia, spigelia, spongia, scutellaria, tarantula, sumbul, valerian, veratrum album,

and veratrum viride, appropriate remedies. Dr. Snader, in his Repertory (Hale's "Diseases of the Heart"), gives the concomitants, etc. The mental symptoms connected with the paroxysms are very important. Such is the power of "suggestion" upon the nervous system that we cannot always know how much the medicine has to do with the arrest of the paroxysms. The belief of the patient that you are giving something to relieve will often aid in arresting them. This is especially the case in hysterical tachycardia. Choreic tachycardia has paroxysms which are very difficult to control. While spigelia, cimicifuga, hyoscyamus, and arsenic will cure the chorea, it requires chloral hydrate or bromide of sodium to arrest the paroxysm. Some paroxysms are notable for the violent, forcible, heaving action of the heart. In such cases veratrum viride in doses of five drops every half-hour will often arrest it, after a few doses. Veratrum album in smaller doses is often equally efficient. One of the most interesting and violent cases ever treated by me was in a man addicted to whisky, tobacco, and excessive venery. I tried many medicines without avail during the paroxysms, and always had to resort in the end to opium. Twenty drops of laudanum always arrested them in fifteen minutes. None of the heart tonics of the digitalis group should be used unless there is dilatation or weakness of the heart. They are powerless, or aggravate in purely neurotic paroxysms. They do not cause palpitation in a normal heart, in which they are neither homeopathic or antagonistic. In the literature of this subject some singular remedies are recorded. One patient was able to delay the paroxysms by taking a deep inspiration and then suspending breathing as long as possible. (This I have several times verified.) Nothagel thinks that a deep inspiration exerts a strong stimulus on the pulmonary fibres of the pneumogastric. This stimulus transmitted to the medulla excites the activity of the inhibitory cardiac centres. Dr. Wood reports a patient who could arrest the paroxysm by swallowing cold water or hot coffee. These probably act on the cardiac centres through the nerves of the stomach. Compression of the vagus in the neck, at the level of the thyroid cartilage, was successful in slowing the heart in several cases. In one of these cases the carotids were compressed and the patient fainted. Afterward the carotids were avoided, the pressure being applied behind them, and the attacks were arrested. Brieger tried this

method and was able to reduce the pulse from two hundred and fifty beats to eighty in the minute. This effect, however, only lasted during the continuance of the pressure. Pressure on the right ovarian region also slowed the pulse, causing at the same time marked cyanosis.

In patients who have during the paroxysms, cyanosis with a cold, clammy skin, forcible dilatation of the sphincter ani will quickly restore the capillary circulation and relieve the heart.

The radical treatment should be directed to the nervous system; the object being to regulate the irregular action of the nerve-centres which control the heart. The use of opium, morphine, alcohol, tobacco, coffee, and tea should be prohibited or closely restricted. All intense business or emotional excitement must be avoided. Without giving special indications for all the medicines useful, I will suggest that ignatia, aurum, nux vomica, strychnine, and ferrum are the most useful. Their use should be continued for weeks or months if we expect to make permanent cures.

Since the above was written a typical case came under my care. A woman aged fifty has had paroxysms since girlhood, commencing with violent and rapid beating of the heart; pulse quick — 150 to 170 — and hard. As the paroxysm progressed the force of the heart's action decreased, until the pulse became very weak, and difficult to count by reason of its rapidity. When called to attend her in her last paroxysm, which had lasted forty-eight hours, she had taken cactus, ignatia, and convallamarin, without arresting it. The pulse was extremely rapid and weak. Glonoine, one drop of the one per cent solution every two hours, alternated with four drops of the tincture of digitalis every two hours, was given; after six hours the pulse was fuller and stronger, 120 per minute. The medicine was suspended twelve hours, when, the pulse being the same, the medicine was given two hours apart, when it soon became normal. In a subsequent paroxysm in the same patient, when the action of the heart had become very quick, feeble, and rapid, other remedies having failed, spartiene sulphate 1x, one grain every half-hour, restored the normal action of the heart in three hours. This drug when properly selected acts quickly and favorably. It seems to act specifically upon the retardator nerves which govern the action of the heart. It does not regulate the rhythm like digitalis, but slows the heart and restores its normal frequency.

"Dr. Poulet, of Plancher-les-Mines, has recently found a remedy for paroxysmal tachycardia in a little-known plant indigenous to Alsace, which appears to exert a rapid and beneficial influence over the paroxysms. The plant in question is the coronilla varia, or *faucille*, which, like some other species of coronilla, is sometimes used as a household remedy, being considered to have cathartic and diuretic properties. Some recent researches by MM. Spillmann and Haushalter on a closely allied species, coronilla scorpioides, showed that that plant acts as a powerful heart tonic, causing an increase in the arterial tension and in the fullness of the pulse, exciting diuresis and diminishing œdema and dyspnœa, acting, in fact, very similar to digitalis. Dr. Poulet was induced by these researches to make trial of coronilla varia in heart cases. He employs a tincture made from the entire plant, also a powder made from the flower. The dose per diem of the tincture is from half a drachm to a drachm, and that of the powder from fifteen to thirty grains. These preparations, though they have a strong characteristic odor, are not nearly so disagreeable to the taste as those of coronilla scorpioides. Details are given of two very severe cases in which these preparations of the coronilla varia gave almost immediate relief. M. Poulet recommends this drug also in other heart cases where digitalis has been used, and where it seems to have been given for too long a period, or, as sometimes occurs, where it has begun to act on the gastro-intestinal canal."

PERSISTENT TACHYCARDIA.

Under this new name I propose to give the etiology and treatment of that mysterious disease known as "Basedow's disease," "Graves's disease," and "Exophthalmic Goitre." This disease has not yet had a specific name, or one suited to its real character and cause. Nor is *Tachycardia* a name that fills all the requirements, for it means only a "rapidly beating heart," but it is a better name than any heretofore given.

This disease, in its complete form of the symptomatic triad, namely: "palpitation with throbbing of the arteries of the neck, vascular turgescence and enlargement of the thyroid body, and prominence of the eyeballs," was first described by Graves in 1835. But

this triad is not always complete, as has been witnessed by many observers. I have seen many cases, which were true examples of this malady, where the protrusion of the eyeballs was not present, while the enlargement of the thyroid was, and other cases where neither the thyroid nor the eyeballs were affected.

The fact is, that this disease is not a disease of the heart, but of the vaso-motor centres in the brain, or of the ganglia in the sympathetic. Graves supposed it was a "cardiac neurosis," *i. e.*, having its seat in the cardiac ganglia. Niemeyer attributes this affection to a "palsy of the vaso-motor nerves." Trousseau thinks it a "neurosis of the sympathetic from congestion or structural change of the ganglionic system." Brunton is of the opinion that the disease is due to "direct stimulation of the accelerator nerves of the heart which descend from the vaso-motor centre in the medulla oblongata in company with the vertebral artery, and after passing through the inferior cervical ganglion of the sympathetic are supplied to the heart." He explains that the protrusion of the eyeballs, the enlargement of the thyroid, and the vascularity and degeneration of the sympathetic ganglia are from the same cause. Hayden believes that this "singular combination of symptoms depends on vaso-motor paresis." My observations have convinced me that Hayden's opinion, added to that of Brunton, is correct. But I believe that in many cases alternate and opposite states of the vaso-motor nerves occur, — at one time paresis, and at other times irritation.

"The questions of the *pathology* and the morbid anatomy of this disease," says Dr. Hammond, "have always been enigmas, and have not to this day been positively and satisfactorily settled, though probably the solution of the problems is not far distant." A year or two ago it was almost universally believed that certain lesions discovered in the cervical sympathetic were responsible for the symptoms. At this date there are many and potent reasons for believing that, in the majority of cases at least, the sympathetic system is not involved at all, or, if it is, it is involved secondarily, and that the lesion is of an irritative nature and is situated in the medulla oblongata. It may possibly not be long before the origin of the disease can be traced to even a higher level, — that is, to the cortex, — for it is well known that mental shocks, such as fear, which unquestionably affect the cortex, have resulted in exophthalmic goitre, just as they have in

epilepsy, in chorea, and many other forms of nervous diseases. At the present time, however, it is only necessary to consider the two theories which can be supported by any evidence which is in the least degree conclusive. These theories are: (1) That exophthalmic goitre is due to disease of the cervical sympathetic system. (2) That it is due to an abnormal condition of the medulla oblongata.

In regard to the first theory, the evidence goes to show that in many cases post-mortem examination discloses diseases of the sympathetic nerve, and particularly of the cervical ganglia. The changes observed in the ganglia are enlargement, hardness and redness, granular degeneration, infiltration with round cells or with spindle-shaped cells, destruction of the ganglionic structure with increase in the amount of connective tissue. Physiological experiments on the sympathetic nerve also prove conclusively that the symptoms of exophthalmic goitre can be produced artificially by this means.

The arguments against this theory are certainly very convincing. A number of cases are recorded where no change can be discovered in either the sympathetic nerve or its ganglia. Hammer, in a report of a case of his own, where no lesion of the sympathetic could be discovered, cites twenty-two other cases where autopsies were obtained. Of these, seven showed lesions in the sympathetic system, while in the fifteen remaining no sympathetic lesion could be discovered at all. Two other autopsies have been reported since then, in neither of which were the sympathetic nerves diseased. As to the physiological experiments, though it is admitted that many of the individual symptoms, such as dilatation of blood-vessels, exophthalmia, enlargement of the thyroid gland, contraction of the lids, and accelerated action of the heart, can readily be obtained by producing artificial lesions of the sympathetic, it is well known that any one such lesion cannot result in all of these symptoms, since some of them are produced by paralysis and others by irritation of the sympathetic. I think it will be admitted that it is clearly impossible for any one lesion to produce both irritation and paralysis at the same time. The theory of a central lesion is far more acceptable to my mind. In the first place, centres are known to exist grouped together within a small area in the medulla, lesions of which result in the appearance of the three principal symptoms of the disease.

Filehne, in his experiments, produced each of the three symp-

toms in turn, and, in one case, all three of them together, a result which has never been attained by any single lesion made on the sympathetic. Probably the fourth symptom—Dr. Bryson's symptom—was obtained also by Filehne, although, not knowing of its existence, he probably did not look for it. In the second place, it does not seem unreasonable to attribute the three principal conditions of vagus paralysis, vaso-motor paralysis, and respiratory paralysis, which produce the four principal symptoms, accelerated heart action, enlargement of the thyroid gland, exophthalmia and diminished chest expansion, to a single circumscribed lesion affecting the vagus nucleus, the vaso-motor nucleus, and the respiratory nucleus. Polyuria, which is a frequent symptom of Graves's disease, can also be produced by a lesion in this region. Physiological research is not unsupported by post-mortem evidence. Dr. W. Hale White, "British Medical Journal," March 30, 1889, has reported a case where "the sympathetic was found to be healthy. A series of sections were made from the lowest part of the medulla to the corpora quadrigemina. At the level of the lowest part of the olivary nucleus there was, just under the posterior surface of the medulla, evidence of slight inflammation. The next few sections were quite healthy, but those in the neighborhood of the sixth nerve showed considerable changes. Immediately under the posterior surface of the medulla, extending from the mesial line as far out as the restiform bodies, which were slightly implicated, were numerous hemorrhages. The area occupied by these hemorrhages did not extend deeply, so that, except for a slight implication of the nerve cells of the sixth nucleus on one side, the nerve cells had escaped injury. The hemorrhages seemed almost entirely limited to the posterior part of the formatio reticularis, but there were two or three small deep ones. They were not marked at this level, but were observed up to the lower part of the aqueduct of Sylvius." Dr. White believes this is the first case where organic lesions have been discovered in the medulla in exophthalmic goitre, but Lockhart Clark reports a case where the "corpora quadrigemina and the medulla, particularly on its posterior part, were very soft, and, on minute examination, displayed the usual appearance of common softening."

There is a strong probability that there is a general dilatation of the blood-vessels. It has been conclusively shown that in exophthal-

mic goitre the electrical resistance of the patient is very much diminished below the normal point. And although, as yet, there is no absolute proof, it seems plausible and probable that a generally dilated condition of the vessels would account for the greatly diminished electrical resistance. In many instances no lesion has been discovered at all, and the burden of proof goes to show that exophthalmic goitre is frequently a reflex neurosis. It is not essential that even the fatal cases should be of organic origin, as a reflex irritation can readily be imagined to be of so powerful a nature as to produce almost total degeneration of the nerve cells in the medulla, which, of course, in the present state of our knowledge, would be undetected after death. The theory that exophthalmic goitre is often of reflex origin is supported by clinical evidence. Simon reports a case on which he operated by means of the galvano-caustic loop for the removal of multiple recurrent mucous polypi of the nose. Within a day or two after the operation, exophthalmia of the right eye suddenly appeared. Græfe's and Stellwag's symptoms were both present, but there was no enlargement of the thyroid gland and no increased action of the heart. Hoffmann, of Cologne, reports a case of exophthalmic goitre which was entirely cured by an operation performed within the nasal cavity; and Hack, of Freiberg, and B. Fränkel, of Berlin, both report cases where operations for nasal diseases have cured cases of Graves's disease. It will not be amiss to mention here that Mr. George Storker, of London, reports two cases where ordinary goitre disappeared after intra-nasal operations. It will be observed that in all of these cases the reflex disturbance was situated within the nasal cavity. The thought will at once occur to us all that if nasal irritation can reflexly result in exophthalmic goitre, irritation in other parts of the body can do the same. It would be well, therefore, in the future examination of patients, to search for and relieve such abnormal conditions as we know are most likely to result in reflex neuroses. These abnormal conditions are most likely to be found in the eyes, the nasal cavity, and the genito-urinary apparatus." (Reflex irritations from the rectum have been known to cause it.)

The deduction from the above is this,— that to cause all *four* of the essential symptoms of this disease united in the same subject, it may be necessary that the lesion shall be in the *cortex*,— that in

those cases in which we find only one (tachycardia) or two (tachycardia and swelling of the thyroid), or any other combination not including all *four*, the lesion or lesions may be confined to the sympathetic, or one centre in the medulla.

Dr. Hammond, in the New York "Medical Journal," January 25, 1890, mentions a new diagnostic symptom. He says: "The usual three cardinal symptoms, upon the existence of one or more of which the diagnosis depends, are so well known as to need no comment. The various other symptoms, which are as often absent as they are present, are so familiar to you all that any further mention of them is superfluous; but there is one symptom which has recently been discovered which deserves considerable attention. I refer to Dr. Louise Bryson's symptom. It has never been observed before as far as I can ascertain, and is of the greatest importance in regard to the prognosis of the disease, and is also of assistance in locating the seat of lesion. Dr. Bryson's symptom consists in the *inability of the patient to expand the chest under forced inspiration up to the normal extent.* In every case that has been examined since Dr. Bryson's discovery, this deficiency has been observed. In some instances the loss of the power of expansion is remarkable, and Dr. Bryson states that where the expansion is found to be reduced to half an inch or less, the termination of the case is invariably fatal.

"This statement has been sustained in at least one case that I know of. In five cases that came under the care of my assistant, Dr. Combes, and in three cases that came under my personal inspection, this symptom was observed; and in all of the cases, as recovery gradually took place, the power of the chest expansion has been slowly restored."

I have a patient who has suffered from this disease for three years (the protrusion of the eyeball is not present), whose chest expansion is only three-quarters of an inch.

Dr. E. C. Williams reports a typical case of a year's duration whose chest expansion was only one-half inch, but under spigelia it has increased to one and a quarter inches.

This symptom should be observed hereafter in every case, and its improvement under remedies noted carefully by measurement.

A new pathognomonic sign of exophthalmic goitre has been described by Dr. P. Guttmann, before the Berlin Medical Society:

"The patients before you are thirty-four and thirty-eight years of age respectively. These women are both suffering from Graves's disease. In both of them by placing the stethoscope over the thyroid one hears a characteristic blowing murmur synchronous with the heart-beats. This murmur is never heard in cases of goitre which are not directly associated with Graves's disease. It is produced in the thyroid itself independently of the existence of any cardiac lesion. It is due, in the first place, to hypertrophy of the left ventricle, a frequent complication of Graves's disease, and in the second place, to unequal distribution of the blood throughout the thyroid vessels. The vessels being irregularly dilated, the blood in its passage through them is thrown into vibrations which give rise to the blowing sound. I repeat, nothing of the kind is ever observed in cases of goitre due to other causes than Graves's disease. The presence of a murmur over an enlarged thyroid is, therefore, of the greatest importance in the diagnosis of Graves's disease, especially in cases where one of the three cardinal symptoms of the affection is wanting. In 1867, Von Græfe observed that cases of exophthalmic goitre are associated with a deficient upper eyelid. This sign is not so constantly present as one I have just indicated. As regards the blowing sounds heard over the jugular veins, they are of no value whatever for purposes of diagnosis."

The *causes* are mental emotion of any sudden intense nature; mental worry long continued; a fright or mental shock; prolonged watching and anxiety. In fact, most authorities agree that nearly all cases originate from the mental sphere. In a few cases the cause was supposed to be violent physical exertion. I can recall but few cases out of the many I have seen that had other than mental or emotional causes, so far as I was able to trace their history. The pulsations of the heart and the radial and other arteries are generally rapid, full, and strong, reaching sometimes as high as 160 per minute. But I have seen this condition change in a day to a condition in which the pulsations of the heart and arteries were irregular, intermittent, and feeble, and continue so for weeks or months; then suddenly reverting to the former condition. All this points to an alternating vaso-motor neurosis. The mental states of the patients are peculiarly changed. A person previously of mild and amiable temperament will become irritable, peevish, impatient, and exacting, and

alternately excited and depressed, or joyous and melancholy by turns. In many cases a hysterical condition is clearly present. The temperature is generally elevated, but I have known cases in which it was subnormal. Morbid appetite and anorexia alternate. The menses are sometimes profuse; at other times scanty. There may be diarrhœa or constipation, both very obstinate.

The *treatment* of this disease has had a most varied history according to the diverse and various theories as to its cause. Those who believed that anæmia was the cause, relied on the use of iron; others gave digitalis, believing it was a local cardiac neurosis. Iodide of potassium had its friends. Electricity and galvanism were used to combat the supposed paralysis of the sympathetic. Iodine has been used for the goitre, but never with decidedly good effects. Belladonna has been given with good results by the dominant school for its supposed antipathic action, while it was really homeopathic. But only a few real cures have been made with these agents. Our own school has not been much more successful because the supposed homeopathicity of the remedies selected was only apparent, not real. There are, according to my studies and observations, only three real homeopathic remedies for this strange disorder. They are aurum, glonoine, and spigelia. Belladonna may be added to the list, but it does not cover all the symptoms. Belladonna has long had some reputation in this disease. The rapid heart, the arterial turgescence, and many concomitant symptoms point it out as a remedy according to the law of similia, but it causes neither protrusion of the eyeballs or enlargement of the thyroid, although it increases the size of their arterial vessels. I admit that it ought to be an excellent palliative, but I doubt its ability to cure. Yet some cures are claimed by both schools in doses ranging from the 3x dilution down to one-fourth of a grain of the extract several times a day. I have not made any cures with small or large doses.

Aurum has the arterial and cardiac excitement, but lacks some of the local symptoms.

The bromide of gold has been used in typical cases of Basedow's disease by some French physicians with alleged success. In two cases I saw marked improvement from the 2x trituration in two-grain doses (one-fiftieth of a grain) three times a day. It relieved

the cerebral throbbing, the mental irritability, melancholia, and the cardiac excitement.

Glonoine has the vaso-motor paralysis to a great degree. It has the sensation and even, to some extent, the real protrusion of the eye-balls. No remedy yet found has the swelling of the thyroid in connection with the tachycardia. In fact, no known drug ever caused a swelling of the thyroid or anything like a goitre.

Glonoine has done good work for me when the throbbing and congestion of the head resulted in positive pain. Here the third dilution was used. It has also been of great value in those cases where sudden cardiac syncope threatened; the heart's action becomes very feeble and irregular, pulse scarcely felt, and the patients thought they were dying. But the proper dose in such cases is the one-fiftieth or one-hundredth grain (one or two drops of the 1c).

The experiments on animals with spigelia, recorded in the last edition of my "Diseases of the Heart," present a perfect and graphic picture of Basedow's disease, including the violent action of the heart, its great rapidity of action, the great protrusion of the eye-balls, and many other symptoms. The provings also show in a marked degree its close homeopathicity. Yet it has been but little used in this disease, and then only as a palliative. Since those experiments were made and published, I have not had a typical case calling for spigelia; therefore I cannot give any personal experience with it. I would advise that it be used with caution as to dose, giving not lower than the 3x.

A case illustrating the curative action of Spigelia, reported by E. C. Williams, M.D., of Chicago.—"Miss A. came to me for treatment with the following history: In June, 1889, she commenced to be troubled with palpitation of the heart (for some months previous to this had not been in good health, she, being a nurse, having to work very hard, with irregular hours). With the palpitation had come some acceleration of the pulse, but with no apparent abnormal heart symptoms. About two months later struma was developed, the enlargement in the course of a short time increasing the circumference of the neck about two and one-half inches. This, however, was subject to changes, varying in size. Almost immediately following this, exophthalmia developed, the left eye more

prominent than the right. At the time of her coming to me she was greatly emaciated, suffering intensely with stabbing pains in and about the heart. There was an insufficiency of the mitral and aortic valves. The chest expansion was only three-quarters of an inch. The pulse was from 140 to 160 beats per minute; temperature about normal; sleep was disturbed; respiration was hurried, and at times caused great aggravation of the 'stabbing' pains. There was great loss of muscular power; in fact, an almost total inability to help herself in any way. Several remedies were tried in rapid succession with no benefit whatever. At last she was put upon spigelia 2x, I being led in that direction by the chapter on spigelia in Dr. E. M. Hale's new edition of his work on the 'Heart.' This drug was prescribed for two weeks, when I thought there was some general improvement. The pains about the heart were certainly relieved. She was then put upon spigelia 6x. In three weeks more there was a marked diminution in the swelling of the thyroid, the protrusion of the eyeballs was less marked, and the pulse-rate was down to 125. This remedy has been prescribed in from three to five times in twenty-four hours, and at the present time the pulse-rate is 80; temperature normal; the swelling at the thyroid has entirely disappeared; the exophthalmus is no longer present; the expansion of the chest is one and three-quarters inches, and the abnormal conditions of the heart are much improved. The lady has gained twenty-five pounds in weight. I am confident now that she will entirely recover."

If we feel we ought to use some preparation containing iodine, spongia is the best, for in its provings we find many symptoms which make it applicable to this disease. Of the newer remedies, I can give some personal experience.

Lycopus will often give great relief, but it is only indicated when, with some exophthalmus, the pulmonary symptoms are the most prominent. Cough, hæmoptysis, and hectic fever, together with the rapid pulse of 140 or more, call especially for this drug. I do not usually give smaller doses than the 1x, and have often seen the best results from five-drop doses of the tincture, frequently repeated.

Baryta muriatica (chloride of barium) is a drug which ought to be beneficial in some cases of Graves's disease. Recent experiments show that small doses are capable of slowing the heart, and making

its action fuller and stronger. Now we know that baryta has great influence over indurations and enlargements of glandular structures, and also to check abnormal development of connective tissue. It seems to me that it ought to be of service in this disease when occurring in the old or prematurely aged, when with a tendency to fatty degeneration and atheroma, there occurs tachycardia with weak heart, and enlargement and induration of the thyroid. It also has the power of contracting the muscular tissues of arteries and veins, and must therefore act on the vaso-motor centres.

Convallaria differs from other cardiac sedatives in its greater power of quieting and calming the nervous system. In Graves's disease, as I have above stated, the mind and brain becomes very irritable, and the emotional sphere morbidly sensitive. Here, the lily of the valley has a very happy effect, calming the almost hysterical erethism as well as the tachycardia. The unpleasant general throbbing of all the arteries is lessened under its influence. The dose is five to ten of the mother tincture or 1x three or four times a day. Always use the tincture of the flowers.

The following case reported by Dr. W. A. Smith, of Morgan Park, Ill., illustrates the action of convallaria:

"Mr. ——, æt. 42, light complexion, presented himself for treatment in April, 1883, with the following symptoms: Rapid action of the heart, averaging 114 beats per minute the first month; eyes slightly protruding, and some enlargement of the thyroid gland. He complained of feeling tired, that he could stand no work or any excitement on account of his heart. Appetite capricious; could not sleep very well; had frontal headache, worse in afternoon. The stethoscope gave a rather peculiar sound that was anæmic in character. As he was a stranger to me, I did not take any particular notice of the eyes or gland, and the diagnosis of the disease was not given, but prescribed bell. 30x, four pellets every three hours. The only improvement was that he rested better, and did not complain of his head. Then I gave iod., dig., ars. iod., and, after them, every remedy in whose symptomatology the word gland was used. After he had been under treatment about six months, and slowly losing ground, he became dissatisfied, and decided to go to Ohio and try his old family physician, and I bade him God-speed, glad to get him out of my care. He was away more than three months, when he

returned with marked aggravation of all the symptoms. Pulse 130, eye-balls very prominent, and the right side of the gland nearly double the size it was when he left. He requested me to again assume charge of the case, and not feeling competent to handle it any more satisfactorily than before, I went to Chicago and consulted with Dr. E. M. Hale. He suggested the use of convallaria tincture, five drops every four hours, for the heart, and under its use the action of that organ became nearer normal, and decreased to 100 beats per minute; but, do what I could or would, he was getting weaker, and when I would stop the convallaria the pulse would bound to 130 or more per minute. He had become almost a skeleton. The conclusion was, that he must be better nourished, and the heart's action be reduced; so I increased the convallaria to ten drops every five hours, and gave beef peptonoids. I never saw anyone do better than he under this treatment; and inside of four months he was at work, and has been ever since.

"The patient died in 1889, of some liver trouble, but not being in attendance I cannot say if the old exophthalmic difficulty returned or not."

Collinsonia has rendered me good service in a few cases when hemorrhoids complicated the case to an unpleasant degree. Hayden mentions a particularly bad case of Graves's disease brought on by painful bleeding piles.

Oleander, as you will see by the provings and recent pathological experiments, is a heart poison which accelerates and depresses the motor function of the heart. Its alkaloid, nerine, or oleandrine, is as powerful as digitalin. I have never used it, but would suggest it in those cases attended with diarrhœa of undigested food, a condition sometimes observed in this disease.

Aconite has been used by both schools in Graves's disease, but I have never seen good results from it except when the pulse is small, tense, and rapid, symptoms which are rare, but have sometimes been observed. Generally, vaso-motor paresis is present, but vaso-motor irritation, with great vascular tension, has been observed.

Dr. E. C. Sequin, New York "Medical Journal," April 26, 1890, speaks highly of aconitine in some cases. In a recent lecture on this disease he says:

"The two new measures I wish to call your attention to are, first,

the systematic employment of aconitine, and, second, bandaging of the protruding eyeballs. In 1884 I rather accidentally discovered that aconitine (the crystallized aconitine of Duquesnel) exerted a powerful reducing influence on nervous or irritative *fast* pulse, *i. e.*, a fast pulse with high tension and normal heart, easily distinguished from the fast pulse of cardiac disease or general debility or fever.

"(Of course, it has long been known that aconite reduces the pulse. I refer to a very decided effect upon a special sort of a pulse.)

"Aconitine in granules of 1-200th of a grain greatly reduces the pulse-rate and also the arterial tension. In Basedow's disease I give from three to eight pills a day for days and weeks, occasionally stopping for a few days. On the average, it is necessary to give two pills three times a day; under this the pulse-rate steadily falls from the upper limits of 160 or 140 a minute to below 100. After that the fall is slower, but in many cases goes on until ninety, eighty, and even seventy beats are recorded to the minute. At the same time the eyes and neck usually improve. This treatment occasionally fails, but it never does any harm. I have used it in quite a number of cases, some without goitre and exophthalmia, since 1884, and it has been tried with good results by several of my professional friends. At the same time iodide of potassium or iron may be given and galvanism applied in the usual way."

Strophanthus is certainly more efficacious in this disease than digitalis. Why this is so I cannot explain, because we have no extensive provings of it. I imagine, however, that its action is more upon the accelerator nerves and less upon the intercardiac ganglia. It has more influence on the thyroid than digitalis, and its sedative action is more lasting. Once the pulse becomes slower, it does not regain its quickness for many days after its use is suspended. In one case it cured the uterine hemorrhages, which were rapidly reducing the patient. The dose varies from five to ten drops of the 1x to the same quantity of the tincture three or four times a day.

Dr. Hammond (*loc. cit.*), of New York, says: "Experiments by Fraser, Drasche, Zerner, and Loaw show that strophanthus prolongs the diastole of the heart, causes it to beat more slowly, and to discharge at each contraction a larger quantity of blood into the arterial system; at the same time the arteries become contracted. These

facts are clearly expressed in an article in the 'British Medical Journal.'

"Bakadhurji, who experimented with strophanthus in coöperation with Langgaard, of Berlin, found that strophanthus has a marked effect upon the vagus. They report also that the respirations are at first increased, but are subsequently slower and weakened. This may be the result on the healthy organism, but in exophthalmic goitre, at least in the cases that have come under my observation, the respiration becomes slower and stronger, while the power of expansion becomes greater. It is, therefore, probable that strophanthus affects the central respiratory centre as well as the vagus centre. If these statements are true, we have in strophanthus a remedy which would exert a powerful influence in subjugating the four principal symptoms of exophthalmic goitre, namely, the exophthalmia, the enlargement of the thyroid, the cardiac rapidity, the shortened respirations, and the diminished chest expansion. Zerner and Loaw have employed strophanthus with success in this disease. Brower reports three very interesting cases which were cured by this drug in from four to six weeks. Three cases of my own showed decided improvement under its use. Other observers have used it with advantage, but the foregoing cases are sufficient to show its practical utility in many instances. The only preparations of the drug which can be obtained are the tincture of strophanthus and strophanthine. The latter is hardly available for therapeutic purposes, as its extreme potency renders its use dangerous. The ordinary dose of strophanthine is 1-5000th of a grain."

Dr. Hammond, in the same article, says: "The other remedy which I wish to call your attention to is the carbazotate of ammonium. As a remedy for exophthalmic goitre, we are indebted for its discovery to my clinical assistant, Dr. A. C. Combes. He discovered it accidentally in the following way: A patient afflicted with exophthalmic goitre consulted him nearly a year ago. She had been under the care of a well-known New York physician, who, not recognizing the nature of her complaint, and thinking she was suffering from some febrile disease, gave her the carbazotate of ammonium. She was subsequently told the name of her disease, and, feeling dissatisfied with her physician, she left him and consulted Dr. Combes. Dr. Combes found that under the drug she was taking, her symp-

toms were disappearing. He continued the remedy with excellent results, and has since used it on five cases, and in all of them with benefit. I have used it on three cases of my own with, I think, decidedly good results. Its use is, however, limited, and for reasons which I will now mention cannot be given indefinitely. Following the direction of Dr. Combes, I have given the remedy in pill form (each pill containing one grain of the drug) three times a day for the first week. In the second week, two pills three times a day are given, and, if it can be borne, three pills three times a day in the third week. The physiological effects of the drug are very decided. They were observed by Dr. Combes, and his observations have been verified by my own. At about the end of the first week the skin and conjunctivæ assume a slight saffron color, which deepens if the drug is persisted in. Then a peculiarly unpleasant odor emanates from the body, which is identical with that produced by dirty feet, and can be distinctly noticed if you approach within six or eight feet of the patient. Following this, severe gastric disturbances show themselves.

"It is rarely possible that patients can take this remedy longer than three weeks, but while they take it the effects upon the heart, the respiratory tract, and the exophthalmia are undoubted."

This drug, called by Dr. Hammond "carbazotate of ammonium," is known to us under the name of "picrate of ammonia," in which picric acid is the real efficient agent. An examination of the provings and physiological experiments given in Allen's "Encyc. Mat. Med.," shows that it causes many of the prominent symptoms of Basedow's disease, viz., the headache with throbbing in the cerebral arteries; pain and soreness in the eyeballs; great irritability of temper; sensation as if a band encircled the chest; palpitation of the heart, etc. But it is doubtful if the drug is really homeopathic to the state of the heart. In the cases where the heart was *slowed*, the doses were large (from one-fiftieth to one grain). In those cases the pulse fell from seventy and seventy-five to fifty-five and fifty. This was a physiological or pathogenetic effect. The primary effect of picric acid may be vaso-motor paresis, with increased action of the heart, similarly to aurum, spigelia, and glonoine; but the secondary effect may be the opposite, though we do not really know. I have never used picrate of ammonia or picric acid in this disease,

nor would I use it or advise its use in such doses as Hammond advises. There may be cases calling for its use as a palliative (homeopathically), and at present we may restrict it to them.

Veratrum viride has been used in exophthalmic goitre. The following case is reported by Dr. Hutchins, of Madison, Ind.:

"Mrs. B. applied to me for treatment July, 1879. Height, above medium; weight, ninety-three pounds; age, thirty-five; mother of three children; her condition, anæmic; greatly debilitated; heart apparently much dilated, without rhythm, with a wallowing movement; eye globes so protuberant as almost preventing closure of lids, presenting shock deformity; goitre not measured, but very prominent; mind deranged. She had suffered with this malady, gradually increasing in gravity, for twelve years. Had been under the treatment of several home physicians, and finally, while visiting in Philadelphia, consulted a physician of that city, who diagnosticated exophthalmic goitre, and advised her to return home immediately as she was liable to fall dead at any hour. I confirmed his diagnosis, and placed the patient on tincture veratrum viride, three drops morning and night, to be gradually increased until the full dose possible to tolerance was obtained. At first the three drops was barely tolerated; four drops produced such weakness as to oblige her to take to bed for a short time. She persevered, however, until twelve drops were taken morning and night without producing nausea or any inconvenience whatever. This dose was continued twice daily for twelve months, then dropped to one dose daily for a few following months. The improvement of the patient was gradual but progressive, and at the expiration of twelve months from beginning of treatment the goitre had disappeared, the eyeballs had receded to their normal position, the mind had returned, and her weight was ascertained to be one hundred and sixty pounds. This lady was seen by me only at long intervals during her treatment, but she faithfully obeyed orders, and took the medicine with the above results. She is now residing in this city in the enjoyment of good health."

This is a case remarkable for the persistence of the physician and the patience of the patient. Veratrum viride slows the heart without causing tension of the arteries. In this respect it is unlike any other drug.

Cyanuret of zinc has been used very successfully in many func-

tional diseases of the heart. The symptoms are violent palpitation with sudden aggravations, accompanied by angina-like pain and a sense of suffocation, with vertigo and sudden unconsciousness. The pulse is quick and full, and there is general throbbing, with an internal tremulous feeling. The affinity of zinc for the brain, cortex, and medulla makes it applicable to some forms of tachycardia due to paresis of the motor and sensory centres in the medulla, and to cases due to cerebral exhaustion. Dose, 2x trit., two to five grains three times daily.

Ferro-cyanuret of potassium is preferable to any other form of iron when there is slow and progressive anæmia added to the symptoms indicating the zinc cyanuret. Several years ago I treated a case of chlorosis and Graves's disease with this ferrous salt. The improvement was rapid and very satisfactory. I used the 1x trituration in five-grain doses three times a day.

The *moral* treatment should not be neglected. The patients should be humored in their whims; not contradicted, but treated with kindness and consideration, and surrounded by the best social influences. All exciting scenes and emotions should be avoided.

They should be placed in a climate which agrees with them, avoiding the extremes of heat and cold or damp localities.

Prof. Nothnagel, of Vienna, in the course of a clinical lecture on Graves's disease, summarizes the treatment of his school as follows:

"Digitalis, according to common experiences, does not act at all on the tachycardia. It requires some firmness not to give this drug, but we may with comfort abstain from doing so, for it does no good. The same observation applies to the other remedies that act in the same way as digitalis. An effective agent against the palpitation is cold, in the form of an ice-bag, either over the cardiac region or over the neck. In some cases the palpitation, restlessness, and excitement are made to disappear or are diminished by the application of cold to the neck sooner than over the cardiac region. These patients ought to live quietly and to avoid coffee, beer, cigars, and mental and bodily excitement. Little or nothing is to be expected from medicinal remedies. According to the most recent observations, galvanism through the medulla oblongata and cervical sympathetic is the best treatment, but this treatment must be regular and long-continued, and should be associated with a hydro-therapeutic course.

The patient is then systematically treated in a cold-water institution with tepid half-baths, irrigations, wrapping in moist linen cloths wrung out, and the cold spinal bag. By this means, along with the mental quietness, an improvement in the condition is, in many cases, brought about. Iron can be given if indicated. In other cases, when patients are much excited, bromide of sodium or potassium may be exhibited in doses of fifteen grains twice or thrice daily. An important means of treatment, but one that can only be carried out in the cases of well-to-do patients, is to send them to the mountain regions, especially to the higher altitudes. By such a sojourn many cases are considerably benefited."

I have never tried such treatment, and I doubt the efficacy of cold applied as he recommends.

If Nothnagel's recommendation of high altitudes prove valuable, some elevations of the Alleghany or Rocky mountains should be advised, but, judging from the effects of elevations higher than five thousand feet, I think they should not go above that limit.

Treatment of the Goitre.— No local treatment is of much value. Applications of an ointment of the iodide or chloride of barium have, in a few of my cases, seemed to decrease its size. Phytolacca has appeared to be of some benefit; also spongia. Hypodermatic injections of iodine and ergotine have not resulted in permanent improvement. Its excision has proved beneficial in a few cases, but a part of the gland should be left.

Treatment of the Exophthalmus.— No special treatment has been suggested, until of late, by Dr. E. C. Sequin, who says in a recent paper, *loc. cit.:*

"*Bandaging of the eyes has never, to my knowledge, been practiced.* In the last two years I have tried it in two cases with excellent results; complete reduction of the exophthalmia in one case. A carefully moulded pad of soft cotton is placed over each eye, filling the orbit, and a light (of not more than three turns) flannel bandage applied with gentle but decided pressure. At first I do this for only an hour twice a day; later, for periods of two or four hours. In one of the cases the bandage was applied at 10 P. M., and allowed to remain all night. During the progress of the second case, which, though it has existed for at least three years, is much improved, I have made occasional opthalmoscopic examinations without detecting

any damage due to the pressure. The pressure should not be great as it is intended simply to counteract the dilatation of vessels in the orbit, which is the usual immediate cause of the exophthalmia."

I have never tried this method of compression of the eyeballs, nor do I remember to have seen any previous recommendation of it, but I can see no harm from it if it is carefully practiced.

"Dr. J. Leonard Corning adopts the following line of treatment. In order to prevent the excessive blood pressure in the thyroid, cranial cavity, and orbit, he places the patient in a warm bath for three-quarters of an hour every day; and sometimes, in addition, he applied elastic straps round the legs so as to interfere with the circulation in the veins, but not so tight as to arrest that in the arteries. By these means he hopes to secure a considerable amount of derivative action, and lessen the blood supply to the thyroid. He also applies styptic collodion to the skin over the thyroid, and fits it with a carefully adjusted elastic truss. He makes daily applications of galvanism to the thyroid gland, employing for this purpose an electrode of potter's clay moistened with iodine, of sufficient size to envelop the whole gland. The negative pole, a flat sponge, is applied to the nape of the neck. The applications are made twice daily, for a period varying from ten to twenty-five minutes, and are continued for six weeks or two months at least. When the pulse is very rapid he gives aconite; when not so rapid, digitalis, spartein, or strophanthus. The diet is very important, and should consist largely of milk, of which the patient may take from two to four quarts a day. Bread and butter, poultry and game may be allowed in moderation. Alcohol in all its forms is contra-indicated. Bitter tonics, arsenic, and iron will often be serviceable. Freedom from excitement and mental strain should be ensured, but simple games, musical entertainments, and a moderate amount of reading may be prescribed. The patient should not of necessity be kept in bed.

As regards the electro-therapeutical treatment of Graves's disease, Mr. H. W. Candew divides cases of Graves's disease in four classes:

(1) Cases that undergo spontaneous recovery, including cases of women who recover during subsequent pregnancy; (2) cases that obtain relief from appropriate drug treatment; (3) cases that obtain relief or cure from an appropriate electrical treatment; (4) cases

that derive no benefit from any treatment, and believes himself justified in stating that the cases which derive any benefit from an appropriate drug treatment would derive an equal, if not a greater, benefit from an appropriate electrical treatment. He recommends the use of galvanism in very weak currents (two or three milliamperes), applied for six minutes three times a day, the anode being placed on the nape of the neck, the centre of its lower border corresponding to the seventh cervical spinous process, and held firmly in that position during the application, while the cathode is moved up and down the side of the neck from the mastoid process along the course of the great nerves.

Dr. Louise Fiske Bryson, in the "Post-Graduate," July, 1892, writes:

"The treatment securing best results has been a combination of mechano-hydrotherapy and rest and exercise, together with the strictest possible attention to the details of dietetics and general hygiene. The drugs that have been most helpful are nux vomica, arsenic, and digitalis sparingly. Moderate altitudes instead of at the sea-level are usually the best health resorts for sufferers from this disease. Hours of rest and exercise must be prescribed, the kind and amount, and never left to the patient's discretion. In exophthalmic goitre, there are always present some alternations in respiratory processes. Respiratory expansion is lessened in more than half of all cases that come under observation. Respirations are increased from twenty to thirty a minute. Increasing chest expansion is of great importance, as the physiology of respiration includes an influence upon the heart itself, upon the pulse, upon blood pressure, and upon the pulmonary circulation. To secure normal respiration, a somewhat novel plan of treatment suggested itself to the author of the preliminary note.

Deep respiratory movements by means of a variety of exercises that raise the arms, expand the chest, and cause deep and regular breathing, having been secured through the agency of an apparatus called the respirator, invented by Dr. Charles Fayette Taylor, which embodies in mechanical form Ling's principle of artificial respiration. The patient sits in a large chair or couch with a jointed movable back, grasping with the hands padded handles suspended from long levers placed at the back of the apparatus. These come to the patient's side in such a way that, when grasped by the hand, the

body is in perfect repose. Steam power is now turned on, the levers rise, the arms are drawn upward, the muscles of arm, chest, and abdomen put upon the stretch, while the upper part of the cushioned back moves and the chest is arched forward. The levers then descend, muscles relax, and the chest returns to its first condition. Respirations adapt themselves to the motion of the levers. When they rise, a deep and full inspiration is taken, the air being forced through in the gentlest manner to enter into and distend the alveoli. When the levers return, expiration is accomplished.

Improvement is rapid, for the chief value of mechano-therapy in nervous or general constitutional disorders is to regenerate the mass of blood as a whole, to combat individual symptoms, and favorably to influence the mental state. The respirator possesses certain advantages over more active and voluntary movements. It exercises without fatigue, without strain upon the will power, and without the intervention and activity of another's personality. The action is entirely passive, as it is steam, an unseen and remote agent, that raises and drops the levers without noise, bustle, or conversation. The effects of systematized respiratory movements, as thus brought about, are, first, to increase the capacity of lungs for air; second, to strengthen the elastic tissue of the alveoli; to open up inactive air cells; to promote free expectoration; to loosen adhesions (pleuritic, etc.); to stimulate pulmonary circulation, nourishing the lung substance; to rectify errors in the general circulation; and to increase the aeration of the blood, thus nourishing the tissues and increasing metabolism. In the treatment of circulatory disorders many of Oertel's arguments to prove the efficacy of mountain climbing apply also to the use of artificial respiration, according to Ling's principles; for Oertel's aim is to reduce the quantity of fluid in the body, to oxidize the accumulated fat, to effect a balance between the arterial and venous systems, and to strengthen the heart-muscles."

At almost the same date that I read the above paper before the Illinois State Society, Dr. Sansom treated of the same subject in a lecture before the London Medical Society.

Dr. Sansom took for his subject the consideration of certain cases of abnormal rapidity of the heart's action. He explained that he did not propose to consider any cases in which valvular or other organic heart disease was found to precede the signs of morbid acceleration.

He also excluded cases in which the condition of rapidity was associated with states of disease accepted by general experience as predisposing causes of such acceleration — such, for instance, as fever, the direct influence of certain germs, marked anæmia, hemorrhage, the operation of certain poisons and conditions of peripheral irritation, such as the presence of undigested food in the alimentary canal, and the sometimes pronounced effects of intestinal worms. Dr. Sansom also excluded cases in which the acceleration was solely paroxysmal ("paroxysmal hurry of the heart"), and also cases of palpitation, when such symptoms occurred in the case of a heart manifesting at the times when such palpitation was absent a normal rate of action. Restricting his review of cases to those not excluded for the above reasons, Dr Sansom employed the term "The Rapid Heart" to designate the clinical condition met with. In some cases there was reason to believe the heart's action was quickened for very protracted periods. The limit of normal frequency was fixed by the orator at ninety in the adult; he thought we must regard as morbid a frequency exceeding this. (In children the cardiac pulsations were normally much more rapid, and were readily excited to a high degree of frequency by various intrinsic and extrinsic causes.) There were several classes of cases in which, in adult life, a long-persistent abnormal rapidity of the heart's action had been observed. In Graves's disease the pulse-rate might be 100 or 150, and under excitement might rise to 180 to 200; this acceleration of the heart's action was often the first sign, and might be for long periods the only manifest sign of the affection. The disease was serious and often fatal, and the chief cause of danger was in the cardiac involvement; in fatal cases the heart was constantly found dilated and hypertrophied, but in no considerable degree. Another class of cases occurred in soldiers. Dr. J. M. Da Costa applied the term "irritable heart" to designate an affection he observed among the men engaged in the American Civil War. Dr. Da Costa observed more than three hundred cases of persistently quick action of the heart, and many of them manifested no obvious departure from health; the respiration-rate was not quickened *pari passu* with the pulse. "Rapid heart" had also been noticed in association with osteo-arthritis by Dr. Kent Spender, of Bath, who said: "The pulse

quickens with the earliest objective signs of osteo-arthritis, there is a gradual rise until the numerical frequency of 110, 115, or 120 is reached, and there is scarcely any physiological variation during day or night. And the cardiac tumult does not always subside, even when the osteo-arthritic phenomena come down; a quickness and irritability continue which no medicine effectually controls."

Cases of rapid heart without notable morbid association also occurred, and Dr. Sansom proceeded to consider such cases in detail. Dr. Bristowe had published nine cases, and excluding one of these on account of the co-existence of organic (valvular) disease, and another because the symptoms were more strictly paroxysmal, seven cases remained. In several of Dr. Bristowe's cases the patients were unconscious of anything abnormal. Yet five out of the seven cases died with signs which seemed to show that the affection was in casual relation with the deaths. One case ended in albuminuria and death after three weeks. In another, after undue rapidity of heart — the rate being from 200 to 260—had continued for six weeks, agonizing pain at the pericardium supervened, and the patient died with symptoms of pulmonary obstruction and failing heart. One of Dr. Bristowe's cases was ushered in by an attack supposed to be a sunstroke. Of six cases mentioned by Dr. Broadbent, one became hemiplegic and another died in convulsions. In one fatal case recorded by Dr. Bristowe, the heart was found post-mortem to be somewhat dilated and hypertrophied, but both the valves and the walls were healthy. In a case noted by Dr. Dreschfeld and Maguire, in which there was a history both of syphilis and of alcoholic excess, the heart was large and its tissue degenerated. The question arose whether the affection was one of the myocardium or of some portion or portions of the nervous system. Dr. Bristowe thought it had no special connection with cardiac disease, and that dilatation and hypertrophy of the heart, when occurring independently of valvular mischief, were the slowly-developed consequences and not the causes of the disturbance. On the other hand, Dr. Samuel West regarded cases of paroxysmal hurry of the heart as due to an organic lesion of the muscular substance, which might be in some cases a form of chronic interstitial myocarditis, consequent, perhaps, on rheumatic pericarditis or on syphilis, and thus related to fibroid disease of the myocardium.

BRADYCARDIA, OR SLOW ACTION OF THE HEART.

The cases hitherto recorded of "slow heart" and the inferences derived from them are not altogether satisfactory, as many errors have arisen owing to the pulse having been only taken at the wrist and not compared with the apex-beat. Dr. Riegel has made observations on 1,047 patients whose hearts beat less than sixty times per minute. Such a condition he terms bradycardia. He divides his cases into two large groups:

(1) Physiological bradycardia. By this Riegel understands a slowing of the heart's action, caused by, or in connection with, some physiological condition. Under this head would come the "slow heart," occurring in puerperal states, also that which is found in cases of starvation, and finally, the bradycardia which is sometimes observed as a constitutional peculiarity. Riegel here remarks that many of the cases of this kind which have been reported are greatly open to question, as some of them were obviously due to some pathological cause.

(2) Pathological bradycardia. There are several varieties under this head: (a) the slowing of the pulse noticed in convalescence from a febrile affection. More than a quarter of the whole number of cases were of this kind. They were most commonly observed after recovery from croupous pneumonia; then, in order of frequency, after typhoid, erysipelas, and acute rheumatism. Traube attributed this phenomenon to a state of general exhaustion. (b) Bradycardia in diseases of the digestive tract. In this division were 379 cases. It was most frequently noticed in affections of the stomach (ulcer, carcinoma, and dilatation). Such a result might have been inferred from physiological experiments; for in animals an increase of arterial tension with diminution in frequency of the pulse takes place when the stomach is submitted to electric, mechanical, or thermic excitation, and is caused by a reflex action of the vagus. The slow pulse of icterus probably depends on the paralyzing action upon the cardiac ganglia by the bile acids in the blood. When occurring in cases of peritonitis, the bradycardia is probably of the nature of those cases described in the first division.

(3) Bradycardia in diseases of the respiratory organs. In this class were eighty-seven cases. Some of them were during conva-

lescence from pleurisy; others from hæmoptysis, or after the withdrawal of a large pleural exudation.

(4) Bradycardia in cases of disorders of the circulatory organs (forty-seven cases). This phenomenon appeared in fatty degeneration of the heart and when the coronary arteries were ossified, but it was never found as a constant symptom of any one disease of the heart; it more often occurred when the heart was flabby and insufficiently nourished.

(5) Slow heart in diseases of the urinary organs (sixty-four cases). Acute nephritis was the most common disease in which it was found; the slowing of the pulse was always accompanied by increase of arterial tension, and was often the earliest sign of the retention in the blood of the urinary constituents, thus denoting the commencement of uræmia.

(6) Bradycardia as a result of poisoning. Riegel noticed it in three cases of lead-poisoning and in five cases of chronic alcoholism.

(7) A pulse under sixty per minute was noticed in twenty-seven cases of anæmia and chlorosis, in one case of extreme anæmia after lead-poisoning, and in three cases of diabetes.

(8) Bradycardia in diseases of the nervous system (ninety-three cases). In many of these cases it was thought to be due to reflex vagus action. In some instances of disease of the central nervous system it was probably caused by direct vagus action; in others Riegel ascribed the symptom to disturbances of the circulation and blood-pressure in the brain; and in the remaining number of cases no definite action could be distinguished.

(9) Bradycardia in other diseases. Under this head were seventeen cases of extreme fatigue and exhaustion, one case of sunstroke, twelve cases of skin diseases, and seventeen of painful affections of the muscles.

Dr. I. E. Atkinson, of Baltimore, writes as follows on this subject: "Bradycardia, or unduly slow heart-action, is a symptom observed in a variety of disorders apart from those in which there is manifest disturbances of the central nervous system. It is not infrequently observed during convalescence from acute febrile disease, when it disappears, usually with the re-establishment of health. Much more uncommonly it develops at the outset or during the active period of such disease. It is thus rarely observed during an attack of acute

articular rheumatism. In the former case it probably depends upon pericarditis or endocarditis, whereby the innervation of the heart is impaired. In the latter case it is probable that in some instances it is still due to these causes, though it may also depend upon the same influences that excite it during convalescence from other acute specific febrile diseases, and which are apparently not inflammatory."

Dr. D. W. Prentice, in a paper on "Slow Pulse" ("Therapeutic Gazette") says: "The causes which produce slow pulse may be classified as follows:

(1) "Diseases or injuries to the nerve-centres, producing either irritation of the pneumogastric, or paralysis of the sympathetic (accelerator) nerves of the heart.

(2) Diseases or injury of the pneumogastric nerve, increasing its irritability.

(3) Diseases or injury of the sympathetic nerves of the heart, paralyzing them.

(4) Diseases of cardiac ganglia, by which the influence of the pneumogastric nerve preponderates.

(5) Disease of the heart-muscle (degeneration), whereby it fails to respond to the normal stimulus.

(6) The actions of poisons, as lead or tobacco, either on nerve-endings or nerve-centres. The poisons generated in salt fish. Also the poisons of certain febrile diseases; algid pernicious fever.

In many of the cases collected in connection with this report, the pathological appearances were a result of the slow pulse rather than the cause.

"In looking up the literature of "Slow Pulse" in the library of the surgeon-general's office, I find it more extensive than I had anticipated. And I wish here to pay a tribute to this magnificent library, and its admirable management for convenience of consultation. Without its "Index Catalogue" it would have been simply impossible for me to have brought together the cases in this abstract. The following is a brief summary, according to the supposed causes or pathological conditions:

(1) Autopsies are given in twenty-seven cases.

(2) Diseases of the brain, eight cases.

(3) Diseases or injury of the cervical vertebræ, eleven cases.

(4) Epilepsy, convulsions, seven cases.

(5) Heart disease, nine cases.

(6) Ossification of aortic valves and coronary arteries, three cases.

(7) Starvation and exhaustion, loss of rest, convalescence, three cases.

(8) Lead-poisoning, nervous shock, pernicious fever, three cases.

(9) Poisoning by salt fish(?), one case.

(10) Cholera morbus, indigestion, three cases.

(11) Acute febrile disease, four cases; also nine cases referred to by Drs. Halpin and Mease, 'Dublin Medical Journal,' xiii., February, 1849.

(12) Pericarditis, two cases.

(13) Cerebral syphilis, two cases.

(14) Rheumatism, one case.

(15) Sunstroke, one case.

(16) Not given, thirty-seven cases.

The slowest pulse was in Case lxxix., when it fell to three per minute. The next slowest pulse was in Case lxxxiii., where it fell to four per minute for four minutes during an attack of syncope, and once did not beat for thirty-five seconds, and again for twenty-five seconds. The next slowest pulse was seven per minute, in Case xxxvi. In Case xxxviii. it fell to nine per minute. In reviewing these cases of slow pulse, it is evident that the pathological conditions are very diverse, but they can probably all be referred to some one of the classes given above. Dr. A. Flint, in his article on the subject in the "American Practice," vol. xiii., 1876, very appropriately divides them into two varieties, namely:

(1) Functional slow pulse.

(2) Organic slow pulse.

Organic slow pulse, including all cases in which organic changes, principally of the nerve-centres or the heart, are evident during life or demonstrated by autopsy.

Functional slow pulse, embracing all cases in which no such lesions can be found.

It will be evident by a glance at the summary given above that nearly one-half of the cases belong to the "functional" division. This fact has a special significance, because it is equivalent to a confession that in nearly one-half of the cases we are ignorant of the true cause of the condition. The same, however, is true of many

very common diseases to which we give a name from certain groups of symptoms, as small-pox, measles, yellow fever, etc. On the same grounds, perhaps, "functional slow pulse" may deserve the dignity of a name as a distinct disease. A large number of the cases correspond very closely in their clinical history to the case which has given a text for this paper. Prodromes of malaise, weariness, and exhaustion. Fainting fits, with momentary unconsciousness, the pulse becoming slow, from a minimum of three per minute to forty per minute, averaging from eighteen to forty per minute. The fainting fits keep pace in frequency and severity with the low rate of the pulse. The attacks are remittent in character, lasting from a few days to several weeks, then remitting for a similar interval, to return with increased severity. The course here outlined continues until the individual dies in a syncopal attack more severe than any preceding, from utter failure of the heart to propel the blood through it.

No organic disease can be detected to account for the slow action of the heart. The symptoms observed are the result of the deficient circulation, and many of the appearances found in autopsy are from the same cause, especially where the case has been prolonged.

Treatment is purely symptomatic, and thus far has not been encouraging.

Prognosis is unfavorable. In the cases recorded all, or nearly all, have terminated fatally, death occurring from sudden syncope. The pathology is entirely in the dark, but further study into the functions of the cardiac nerves and ganglia in their relations to the heart-muscle promises to throw light on the subject.

It is possible that 'functional slow pulse' may be a disease of the cardiac ganglia."

Treatment. — The medicines capable of causing slow pulse enumerated by Dr. Snader (Repertory of Heart Symptoms in "Hale's Lectures on Diseases of the Heart") are very many, but not all can be relied upon as remedies for this condition. Those which I consider trustworthy are: aconite, adonis, amygdala amara, apocynum cannabium, asparagus, baryta, cactus, caffeine, cannabis indica, chelidonium, convallaria, colchicum, digitalis, euonymin, gelsemium, hellebore, helonias, hydrocyanic acid, iberis, bromide of potassium, cyanide of potassium, nitrate of potassium, kalmia, lobelia, lycopus, cyanide of mercury, naja, nicotine, oleander, opium, plumbum, secale,

scutellaria, spigelia, kola, strophanthus, squilla, veratrum album and veratrum viride. All these cause a slow pulse, primarily; but the character of this slow pulse is not the same with all. In the "Repertory" referred to, the characteristic pulse of each is given very accurately. In selecting the remedy there is one point which should not be lost sight of, namely, that if the condition causing the slow pulse is a primary affection, only the above medicines will be effective; and if the slow heart and pulse is a secondary affection, other medicines should be consulted. I mean those which primarily cause a rapid pulse and rapid heart-beat, and secondarily a slow beat from exhaustion after previous over-stimulation. As our "Repertories" are now constructed it is very difficult for the average practitioner to ascertain what medicines cause a rapid pulse as a primary effect, because no distinction is made between the primary and secondary effects of drugs. Under the head of "rapid pulse" Snader places all the medicines I have mentioned above, and twice as many other drugs. I admit that our knowledge is incomplete, yet I venture to name a few belonging to the class that have this primary action, namely: amyl nitrite, ambra, carbonate of ammonium, apis, arsenic, asafœtida, atropine, aurum, anhalonium, belladonna, bryonia, cannabis indica, cinchona, chininum sulph., coca, ferrum, glonoine, hyoscyamus, ignatia, jaborandi, phosphorus, physostigma, rhus toxicodendron, sanguinaria, sumbul, nux vomica, strychnine, strammonium, turpentine, and tartar emetic. In selecting a remedy for slow pulse and slow heart, the pulse-beat and heart-beat should be synchronous, but only few provers observed the pulse and the heart-beat at the same moment. Then, again, the elements of irregularity and intermittency should be left out. A drug like laurocerasus may be selected from this one symptom, but if the slow heart be due to bile-acids in the blood, it will do no good; while if euonymin is given it removes the slow pulse by bringing about a normal activity of the hepatic cells. If possible we should ascertain the cause of the slow heart, and select the remedy accordingly. If the slow heart occurs during the puerperal state it is a secondary condition and usually requires ignatia, cimicifuga, arsenic, strychnine, or belladonna. If from inanition, food and stimulants with nux vomica are needed. If it is really constitutional, as it was in the case of Napoleon, drugs should not be given at all. If the slow pulse occurs during convalescence

from acute fevers, arsenic, cinchona, quinine, nux vomica, strychnine, phosphoric acid, or sanguinaria are needed. When it occurs from profound neurasthenia (cardiasthenia), picric acid, phosphoric acid, phosphorus, and strychnine are to be relied on. If fatty degeneration of the heart is suspected phosphorus is the most homeopathic remedy. Iodoform has caused that condition. But the arseniate of strychnine should be given in any case to keep up the tonicity of the muscular fibres.

In renal diseases slow pulse indicates impending uræmia. In such case we must eliminate the constituents of the urine from the blood before we can expect the heart's action to improve. Here diuretin, apocynum, and juniper should be given. In a majority of cases we cannot find the cause of the slowness of the heart. We must then select the medicine from its close similarity to the subjective symptoms.

I have treated in all perhaps fifty cases of slow heart. Of these I have removed the symptom in three-fourths. The chief medicines in all the cases cured were digitalis, strychnine, and sanguinaria. The usual dose of digitalis was five to ten drops of the 1x dilution; of strychnine, from 1-5000th to 1-50th of a grain, and of sanguinaria, one to five drops of the 1x or tincture. The dose was repeated, usually three times daily.

For the fainting fits which occur in some cases, ammonia, amyl nitrite, and glonoine are most useful and often save life. It is not safe to use electricity for we do not know to a surety what it will do. In one case in which an expert used it on one of my patients it seemed to arrest forever the action of the heart. In a case related by Dr. Prescott the patient got more relief from bromide of ammonium in large doses during the paroxysm of fainting and anxiety than from amyl or glonoine. If the patient's heart is very weak as well as slow great caution should be used in his exercise. No climbing of stairs or hills, no sudden change of posture, and no running. The meals should be frequent and small. All sudden and violent emotions should be avoided. Alcohol is injurious, and should be carefully given in emergencies, for it always weakens the heart in the end. A small cup of black coffee is better. If any wine is used, Tokay and wine of coca are the best. Lying on the left side and straining at stool and lifting should be forbidden.

THE SENILE HEART.

A broad definition of senile heart would be, the heart of old age. But old age is a relative term. Senility does not always come with years. Gladstone is as young and his heart as sound as that of many of his contemporaries of half his age. There is a premature senility of the heart as of any other organ. The tissues of the heart and its nerve supply may wear out and undergo degeneration, while all the other organs and tissues are comparatively sound.

Senility of the heart may be due to degeneration of its muscular fibres, of its nerves and ganglia, of its arteries, or of its nerves of innervation from the medulla or spinal cord. It would not do to restrict the definition to the heart of extreme old age which is worn out, together with all other parts of the body — a general decay for which there are no remedies — only temporary palliatives.

Dr. Balfour, of Edinburgh, the only author who has written extensively on this subject, says, "the senile heart is generally a gouty heart"; but that is not so at present in this country, although it may be in England and on the Continent. The American senile heart is generally premature and caused by the morbid mental and physical activity of business life here. The degeneration usually begins in the inhibitory nerve and not in the heart itself.

"We can never hope," says Balfour, "to rejuvenate the old, but age and suffering are not synonymous terms, and the absence of suffering does much to compensate for the loss of youth. The heart is the one organ of the body whose sufferings are most apt to disturb the equanimity even of the most imperturbable. We know that with each pulsation life and intelligence are flashed to the farthest outpost of our frame, and we also know that if the heart-beats falter for a second or two we fall to the ground, pale, limp, and almost inanimate. Hence palpitation, intermission, irregularity, and tremor cordis, all of which make themselves disagreeably perceptible to our senses, appeal most forcibly to the imagination of the patient, and bring him more certainly to the physician than cardiac ailments of more serious import but less obtrusive character. Such symptoms occurring in early life may betoken physical impairment, but are more commonly indicative of mere nervous instability; neither of these may be of much consequence. In advanced life, however, or

at any time after middle life, there is always some physical impairment of the organ concerned, and there is also the possibility that this may be primarily due to failure of the trophic nerve centres. That this cannot be generally or even often the case may be regarded as proved by the marked improvement that follows treatment in the majority of cases. A primary affection of the nerve centres must, however, be regarded as a quite possible cause, and to it may probably be ascribed the intractability of some at least of those cases we meet with. Senile diseases are always degenerative, and tend to precipitate the natural termination of life. In them the object of treatment is not quite the same as it is in diseases of earlier life; we no longer hope for complete restoration, but we expect to be able to remove suffering and to check decadency, and, so far as the heart is concerned, there is good reason for believing that we are frequently successful in the attainment of both of these objects. Indeed, such is the recuperative power of this organ, that even although the average limit of mortality be long over-passed, we can often remove discomfort, and avert decadency so completely as apparently to effect a cure of what is of necessity incurable. In this fight with mortality it is not medicines, though these, too, have their place and power, so much as attention to the little things of daily life, the little things of eating, drinking, and doing that gradually turn the scale of health for evil or for good; and herein lies one of the great difficulties in the way of successful treatment, for the physician has certain regulations to lay down which, almost of necessity, are opposed to the habits of a lifetime. But where science is opposed to lifelong habit, there is never any doubt as to which ought to yield."

It is well to remember, however, that all affections of the heart found in the old are not necessarily senile in origin.

Another point to be remembered is, that even when an existing affection of the heart is certainly senile in character, in the sense of having come on primarily and insidiously after middle life, and possessing the ordinary characters of a heart strain from internal causes, the symptoms complained of do not always depend upon the heart's affection, even when they seem to be distinctly cardiac in their nature. For instance, great breathlessness accompanying a heart with distinct and free mitral regurgitation, as revealed by a loud mitral murmur, is by no means always due to the heart affection, or to be relieved

by ordinary cardiac tonics. Many such cases are due to anæmia arising from some obscure source, such as melanæmia from various causes, or even epistaxis, which, apart from occasional severe outbursts, may be attended by persistent oozing from the posterior nares, trifling in itself, serious from its continuance. Obscure malignant disease of some internal organ is also no infrequent cause of anæmia, which may not only give rise to great breathlessness on exertion, but also to emotional or reflex attacks of nocturnal breathlessness, often slumped under the name of cardiac asthma. Yet the cardiac action in many such cases may be full and strong, the existing lesion perfectly compensated, and the subjective symptoms largely in excess of the objective cardiac phenomena. In all such cases it is the condition of the blood we must treat, not that of the heart. We must do our best to remove the anæmia, and content ourselves with watching the heart and treating it as occasion arises. Even œdema of the lower limbs, so often found as an early indication of cardiac failure, not infrequently arises from the state of the blood alone, and not from the heart at all. We are all accustomed to note the condition of the blood as all-important in the breathlessness and œdema of spanæmic patients in early life, in whom there is probably no great indication of any affection of the heart; but in cases of marked valvular lesion in advanced life we, as a rule, are scarcely prepared to look beyond this lesion, and the condition of the blood is too often neglected, to the great detriment of the patient. And yet there are so many serious causes of impoverishment of the blood in advanced life that our prognosis can never be safe, nor our treatment beneficial until the case has been duly considered from every point of view.

Simple irritability is the earliest indication of what I may call advancing senility in the heart. The patient complains of uneasiness in the cardiac region, at times amounting to actual pain felt in or around the heart, but strictly localized and not shooting or darting in any direction. Along with this there may be fits of palpitation, in the form of rapid but not usually forcible action, which come on after exertion, such as running rather quickly up-stairs, upon any excitement or sudden emotion, or during the night from reflex causes, mostly of gastric origin; or there may be fits of tremor cordis coming on suddenly, without warning and apparently without cause. The rhythm of the pulse is occasionally and temporarily irregular

in force and frequency; or it may simply intermit, drop a beat at irregular intervals; or this intermission or dropping of a beat may occur at regular intervals of longer or shorter duration, and this regular intermission at irregular intervals, and mostly as the result of emotion or of gastric disturbance.

These phenomena are always indicative of cardiac debility, which, left to itself, sooner or later leads to dilatation of the heart, as well as to the other serious symptoms which we find associated with senile degeneration of that organ. These symptoms depend upon structural alternations in the heart itself, in its vascular and nervous connections, as well as in the nutritive fluid, the blood.

Thus one patient may for years complain of nothing but an occasional soreness in the cardiac region, and at last break down suddenly from neurasthenia, as he flatters himself, really from cardiac dilatation, which may end in dropsical asthenia in the usual way. Not infrequently it may terminate in a fatal attack of angina of the ordinary form, or occasionally in that form of sudden cardiac failure which may be termed angina sine dolore. Another patient may only complain of occasional intermission or fluttering tremor cordis which annoys him by its recurrence, and such a case perhaps terminates suddenly in an attack of angina sine dolore more often than in any other way; while there are others in whom intermission or irregularity of the pulse or tremor cordis persist for many years without any apparent detriment. But my own experience is, that unless remedied by treatment, such cases always ultimately develop serious cardiac symptoms, though this may be delayed even to hoary age. Many such patients do not seem to suffer in any way from their ailment; it seems somehow completely to escape their cognizance; others, again, suffer very much from the feeling of insecurity engendered by their malady.

With the cardiac irregularities and intermissions of the aged there is, however, so often a faltering of consciousness, or of muscular power, that as a rule paralysis or brain failure is dreaded much more often than failure of the heart. The senile heart is a term, as we have seen, which comprehends many symptoms and a variety of signs, but which is at bottom a cardiac failure based upon malnutrition, with whatsoever symptoms that malnutrition may be associated, or by whatsoever signs it may be revealed. It is therefore of the

utmost importance to determine the cause of this failure, and to ascertain the source of the malnutrition on which it depends. In all these cases the objective symptoms are always the most valuable and most to be relied upon; the subjective symptoms must also be collected and collated, and much information is thus obtained, but in no case is this information so important or so reliable.

(The pulse is an important factor in the diagnosis and treatment. I refer to my articles on "Low Arterial Tension" and "High Arterial Tension.")

Dr. Balfour gives the following directions for *diet:* "Cases of senile heart may be grouped for dietetic purposes under two distinct heads: First, those who are over their normal weight, who are breathless with occasional irregularity of the heart, and without marked signs of cardiac dilatation; and, secondly, those who are at or above their normal weight, and who suffer very considerably from cardiac disturbances of various characters, also with or without very evident signs of dilatation of the heart."

[The first class of cases are usually dubbed cases of fatty heart, and the diet laid down in the article on "Obesity" will be suitable. The second class are grouped under the ordinary heading of cardiac disease, and the diet recommended for "Leanness" should be advised.]

"The first point of importance in regard to all cases where dieting and dietary come into question is to divide the day properly, so that there may be a sufficient interval between each meal. In health the stomach empties itself usually three to four hours after a meal, and requires a rest before more food is ingested. In those having weak hearts and feeble circulations the digestion is bound to be somewhat slower, hence the first rule to lay down is: not less than five hours between each meal. This allows of three statutory meals in the day, with a sufficient interval for the digestion of the last meal to be pretty well advanced before retiring to rest, which tends to insure a quiet and restful night. The next matter of importance to remember is, that the ingestion of solid food into a stomach still digesting a former meal arrests that process and provokes flatulence, hence the second rule to be laid down is: no solid food of any kind is to be taken between meals. This rule must be absolute; not even a morsel of cake or biscuit, or any similar trifle, is to be ingested between

meals. There is nothing so destructive of gastric comfort as the continual pecking induced by gouty bulimia. This prohibition does not extend to water, which should be taken hot rather than cold; and of this hot water half a pint may be sipped if desired about two or three hours after a meal. Taken in this way it does not disturb the digestion, it washes out the stomach, and passes speedily through the kidneys without raising the blood-pressure. But as little fluid as possible should be taken with meals. The third important rule is, that all invalids should have their most important meal in the middle of the day, and should only have a light meal in the evening. Next follows the important question of quantity and of quality, matters very closely connected one with the other; for the isodynamic value of one kind of food compared with that of another depends upon their respective powers of producing energy.

"Lewis Cornaro, perhaps the most celebrated of abstinents, reduced his solids to twelve ounces, and his fluids to fourteen ounces of new wine in the day, and continued to maintain himself in perfect health till his death, which happened when he was over one hundred years old. At one time some of his friends persuaded him to take daily a couple of ounces more of solids and the same of wine, but this trifling excess made him ill. No doubt Cornaro was an idle man, and did not exert either his body or his mind, and he took his food in the shape of bread, meat, and eggs, and his drink as new wine, all highly nutritious articles of diet; so that, although as regards mere quantity Cornaro's diet appears to be scarcely a bare subsistence, yet having regard to its composition it was, as it turned out to be, perfectly sufficient. It is but rarely if ever that we can possibly desire to restrict the diet of our patients so rigidly as Cornaro did his own; but as none of our patients are at work, and many of them probably obese, it is a diet worth remembering as one upon which its recipient lived in perfect health, not for a month or two, but for more than sixty years. The knowledge of this suffices to make one rather callous when assailed by complaints of being starved; still it is very desirable to watch all obese patients lest they should come down too rapidly, and to see that all others maintain their equilibrium in comfort. We must, therefore, weigh our patients occasionally.

"Alcohol in one or other of its various forms is often recom-

mended as a fillip to a weak heart, or an aid to a feeble digestion, and so it is *pro tempore;* but there is no greater mistake than to continue it as likely to benefit. Alcohol always tends to enfeeble a weak heart, and to lessen the power of a feeble digestion, when continued for any length of time, and ought to be given up. I once knew a lady who suffered much from a feeble, irregular heart, partly hereditary and partly acquired, who obtained so much relief from the use of alcohol that she not only recommended frequent 'nips' to all similar sufferers, as a specific, but was in great danger herself of becoming a victim to immoderate indulgence. By and by, under other influences she was led to give up the use of alcohol entirely, and she has often assured me that the sipping of hot water was quite as stimulating to the heart at the time, and ultimately far more strengthening than the use of alcohol. From what has just been said it may be gathered that I never advise alcohol in any form for such cases, and where old habits are too strong I recommend that only light claret or light and white hock should be taken with dinner, and of these not more than one or at the most two glasses. Whisky, as one of the purest spirits, is also one of the safest, being utterly devoid of the slightest tendency to develop gout, a tendency which even light claret is not altogether free from unless used most sparingly.

"Tobacco is a narcotic — a powerful narcotic, not to be abused with impunity. The tobacco heart is a well known and easily recognized form of cardiac irregularity, for which there are many palliatives, but only one cure — to give up tobacco. Cigarette smoking and inhaling the smoke into the lungs is the most deadly mode of using the drug, and by far the most difficult habit to break. Other forms of tobacco smoking — pipes and cigars — are very much alike, and their influence for evil depends upon the quantity smoked, and in a considerable degree, also, upon the quality of tobacco. Withal it takes a good deal of tobacco to hurt some people. The last patient who was brought to me for tumbling on the street from this cause, was in the habit of inhaling fifty cigarettes daily; he had a pasty, sodden look, and I gave him to understand that unless this bad habit was given up, his life was not likely to be long. Mr. Syne used to say: 'Young men, bubbling over with energy, both can and do smoke more than they ought; but old men cannot smoke with impunity.' This is the rule, to which there are many exceptions; a few of these

are real — few can smoke with impunity, others conceal their sufferings."

"With a weak, feeble, and irregular heart it is wise to give up tobacco altogether, though it is possible for many, not for all, to continue to smoke moderately to the end, if the smoking be restricted to a single pipe or cigar in the evening. There is no habit in which idiosyncrasy plays so great a part as in tobacco smoking; let every man be fully persuaded in his own mind. The drugs useful in the senile heart in all its forms are but few in number, but of extreme value. We may easily multiply the number, but with the multiplication the value is not increased. All varieties of the senile heart are forms of heart failure with complications; the treatment must therefore be tonic, with modifications."

Dr. Balfour's treatment, given below, is far in advance of the usual regular medication. His use of drugs are based on their physiological effects, as understood by the old school. It is well known to those conversant with my writings, and my theory of primary and secondary action, that nearly all the medicines which he calls cardiac tonics are really secondarily homœopathic. Digitalis, for instance, if pushed beyond its primary action, causes finally a condition of cardiac debility similar to that for which it is prescribed by all regular physicians. They have no use for the primary effects of digitalis, *i. e.*, they never give it for a strong, spasmodic action of the heart, with contracted arterioles, vertigo, etc.

Digitalis, according to Balfour, "is the chief and most thoroughly reliable cardiac tonic; where any drug can act at all it will never fail, and, carefully managed, there is no risk of any danger or discomfort in continuing it for as long as may be needful. Under the influence of digitalis the whole muscular system becomes more elastic, each muscle both extends and contracts more perfectly, and as the heart gets the benefit of all the blood in the body passing through it, the drug affects it earlier and more powerfully than the other muscles. The muscular coat of the arterioles gets, also, proportionately larger share of what is going, and the effect of the more perfect contraction of both heart and arterioles is to raise the blood-pressure by improving the circulation, increasing the amount of blood in the arteries, and diminishing the stagnation in the veins. The result of this improvement of the circulation is to cause the absorption, from

the interstices of the tissues, of the fluid which has been slowly accumulating there under the influence of *venous remora.* The absorption of this soakage, which has nowhere appeared as dropsy, increases the flow of urine and proportionately diminishes the weight of the body, quite apart from any interference with its metabolism. Although digitalis improves the extension of a muscle as well as its contraction, it does so by improving its elasticity and restoring its tone; hence, even though the diastole of a dilated heart may be prolonged, the ventricle is not filled any fuller, but rather less so, and this is especially well seen in cases of aortic regurgitation, where, in spite of a prolonged diastole, the ventricle is found to diminish in size as its beats increase in force."

My experience with digitalis agrees with that of Balfour. In the treatment of a weak and dilated heart I always give a material dose, just enough to set up its physiological but mild primary action. Balfour prefers the alcoholic tincture for the reason that it does not contain digitonin, a principle antagonistic to digitalin and digitoxin. Digitonin is not soluble in alcohol, the two latter are. But Balfour and all practical physicians are aware that in cardiac dropsy the infusion will act favorably when the tincture will not. There must therefore be some potent influence in digitalin, possibly on the kidneys, not possessed by the two other alkaloids. When we have no dropsy to deal with I also prefer the tincture. Balfour prefers Nativelle's granules, which are said to be composed almost entirely of digitoxin, which has an action precisely similar but perhaps more powerful than digitalin. I have never used them, but I get good results from tablet triturates of the 8x trituration of crystalized digitalin, each one containing 1-1000th of a grain. Nativelle's granules each contain a quarter of a milligramme (about 1-250th of a grain). Balfour gives one granule every twenty-four or forty-eight hours, and says he has never found a heart requiring a smaller dose.

He believes it necessary in order to build up a senile and dilated heart to continue the use of digitalin for several months. I believe that the reason why physicians so often fail to get good effects from digitalis in the chronic weak heart is that they do not continue its use long enough. If they do not find the heart grow stronger and more regular in a week or two, they abandon the medicine. They do not consider that a heart that has been growing weak for

years requires months to attain any decidedly permanent improvement.

Baryta muriatica ought to be one of the best remedies for the senile heart when the weakness depends on degeneration of its arteries and its muscular fibres. The 2x trituration in two-grain doses three times daily for several weeks should be persisted in.

Aurum muriaticum in alternation or combination with nitrate of strychnine 2x trituration is a potent restoration of the senile heart when it is dilated and deficient in innervation.

If the dose of digitalis be moderate, this increase of tone, accompanied by an improvement in nutrition, due to a more effective flushing of the heart with a more perfect nutrient fluid, may be kept up and continued indefinitely for months or years without any fear of its action going further. But if the dose of digitalis is in excess of what is required, the contraction of the heart goes on increasing till the symptoms of digitalis poisoning occur, the heart ultimately coming to a standstill in systole. It is the duty of the physician to see that the happy mean is not exceeded; and there is the less temptation even to approach excess in treating the senile heart, and there is first of all, certainly, some risk of rupturing arteries which may be atheromatous by the rise of blood-pressure due to the drug, though I believe this risk is infinitesimal; and, secondly, because we can scarcely ever hope to contract and cure a dilated and hypertrophied senile heart.

There is only one other member of the digitalis group which has any pretentions to rival digitalis itself, and that is strophanthus, but it is so much more uncertain in its action than the leading member of its group, that I never felt inclined to displace our indigenous drug in its favor. Moreover, if, as some experimentalists say, its action is chiefly expended on the papillary muscle, while there is either no increase, or 'only a very slight increase in the force of the contractions of the ventricular wall,' it would seem from its action alone to be scarcely the drug to trust to in the class of cases I am now speaking of. There is no doubt, however, that the strophanthus is a powerful heart tonic, and it has more than once happened to me that the heart of a senile patient apparently moribund has been roused to action by the tincture of strophanthus when it appeared to be already beyond the reach of digitalis; and as strophanthus is readily soluble

in water, which neither digitalin nor digitoxin are, there is an obvious advantage in its hypodermic use in such cases.

Many physicians in France and America are using strophanthin. It is soluble in water, which digitalin is not, and is therefore better for hypodermatic use. The dose is from one-hundredth to one-five-hundredth of a grain. In some cases digitalis and digitalin seem to contract the arterioles so much that the heart is made to work too hard to overcome this obstruction. Here strophanthus and strophanthin should be used, because it only slightly contracts the arterioles. The same can be said of coronilla.

Dr. R. Babcock, of Chicago, uses convallaria, and its alkaloid convallaramin, when digitalis does not agree with the patient, or has ceased to act after it has been used some time. The officinal dose of the active principle is put at one-hundredth of a grain (1c), which may do good service in neurotic affections of the heart; but in threatened failure from dilatation and incompetency, it requires from one-twentieth to one-tenth of a grain repeated every four hours. Dr. Babcock asserts he has saved life by giving one-sixth of a grain.

Strychnine is a most valuable remedy in the treatment of the senile heart; it is a most admirable gastric tonic, especially when venous congestion and a tendency to catarrh exist, as is so constantly the case when the circulation is feeble; it improves the circulation by increasing the intra-arterial blood-pressure, and it stimulates the motor ganglia of the heart, accumulating energy (resp. excitability) within them. In a great many cases, even of well-marked senile irregularity, the continuous use of strychnine is sufficient of itself to promote a cure, while it is a powerful adjuvant to the use of digitalis, and the combination of these two drugs often enables the most admirable results to be obtained, quite unattainable by either separately. As strychnine is the active principle of nux-vomica, similar results are occasionally obtained by employing either the extract or the tincture of that drug; but as the quantity of strychnine present in either of these preparations is uncertain, it is always better to employ the liquor strychninæ hydrochloratis, as only thus can we secure an accurate dosage. Strychnine is said to be a cumulative poison, and so it doubtless is, but if a moderate yet effective dose is given, its use may be continued for many years without the slightest indication of any poisonous action. I have known of five minims of the

liquor strychninæ (one-twentieth of a grain of strychnine) to be taken continuously twice a day for over ten years, with nothing but a constantly increasing benefit; while, on the other hand, I have seen so small an increase as another five minims—fifteen minims in the day—followed in no long time by indications of a poisonous action. In the use of all drugs idiosyncrasy occasionally turns up, and for this we must be prepared, but the doses I have indicated are those suitable for by far the larger number of people. When we have to do with small, but especially with anæmic, patients, we must reduce the dose of all cumulative drugs to a minimum, and even then there may be intolerance in a few cases, and it may be needful to vary the drug. Thus, in cases in which we would by preference have employed digitalis, or even a combination of digitalis with strychnine, we may be able only to use strychnine, and even that in almost infinitesimal doses. But these are very exceptional cases. The reverse by no means holds good; it would never do to give a patient a larger dose than usual because he happens to be bulkier or more full-blooded than usual; a larger dose may be tolerated, but it must be only rarely necessary, and we must feel our way towards it with considerable caution.

In spite of the old dictum of our school, I have advised and used for many years a combination of digitalis and nux vomica, each tablet containing two drops of the tincture of each; also, a tablet of digitalis and strychnine, containing one-hundredth of a grain of each. I have never seen any but good results from them, and I have found that the combined is better than the alternated action. In anæmic patients I give a granule of iron, digitalis, and strychnine. All fears of antidotal action is absolutely baseless. Each drug does its own work, independently of the other.

"Arsenic is another of those remedies indispensable in the treatment of the senile heart, quite as much so as digitalis. It is an excellent tonic and stomachic; it is one of the best anti-neuralgics we possess, and has been found extremely useful in many cases of angina; it is said to increase the number of the blood corpuscles, and to restore youth and vitality to old worn-out horses and men. And it does all this often in the most minute dose; one-hundredth of a grain of arsenious acid once a day is often the largest dose that can be tolerated. I well remember one old gentleman, who had been

taking one-hundredth of a grain of arsenious acid for two or three weeks, and nothing else, for a dilated and hypertrophied heart, saying to me: 'I don't know what benefit you expected from the treatment, but I know what I have received; I can go up-stairs now much easier than I used to do.' Whereupon I expounded to him the use of arsenic by the Styrian mountaineers, for the purpose of improving their wind and enabling them to climb their mountains more easily. Arsenic may be given alone, or it may be combined with digitalis or with strychnine and arsenic.

"In cases where the blood is deficient in hæmoglobin, iron is a positive necessity; it should be given along with the food, and never at the same time as digitalis, this combination being extremely apt to sicken. (This is not the opinion of Fothergill, and I never found it to do so.) The proto-salts of iron are to be preferred to the per-salts, as they are more easily decomposed by the acids of the gastric juice, and are therefore more readily assimilated. Large doses in such cases are not as a rule required. Next to strengthening the heart and improving the blood, lowering the blood-pressure is the most important object of our treatment; indeed, we cannot in many cases do anything towards strengthening the heart till we have lowered the blood-pressure, the heart resenting and rebelling against all till the obstacle to the freedom of its action is removed. In all cases of angina, also, whether vaso-motoria or not, the initial stage would seem to be a sudden rise of blood-pressure, not always, perhaps, detectible in the pulse, but always perceptible to the heart, and to be relieved by promoting the free passage of the blood through the arterioles. For prompt and immediate relief to the pain of angina, or breathlessness due to vaso-motor and bronchial spasm that so accompanies the senile heart, there are two drugs of supreme importance, nitrite of amyl and nitro-glycerine; sometimes the amyl seems to give most relief, and at other times the nitro-glycerine; of the two, the trinitrin (glonoin) has the most persistent action, and is, upon the whole, the more certain, and therefore to be preferred. Nitrite of amyl seems to lose its usefulness somewhat by keeping; it still flushes the face and unlocks the arterioles, but does not relieve the pain. Several years ago I had a patient who suffered much from angina, and who only got relief from the amyl when freshly prepared. Since then the amyl has been introduced into hermetically sealed glass cap-

sules, and this seems greatly to preserve its efficacy. All the nitrites are available for relieving spasm and lowering blood-pressure; but the nitro-glycerine seems to act most rapidly and effectively, and in the form of tabellæ, each containing 1-100th of a grain, it is easily carried about and readily available upon the slightest indication of pain or spasm. One or two of these give relief in about a minute, which lasts for one or more hours; these tabellæ may be repeated several times a day if required. The ill effects it may produce are headache, giddiness, throbbing of the cerebral arteries, and palpitation; but it is somewhat remarkable how rarely these are complained of. Most patients prefer the nitro-glycerine to the amyl, and in the form of the liquor trinitrinæ its action is even more rapid than as tabellæ, but of course it is less easily carried about. When the high intra-arterial blood-pressure is more persistent and more distinctly gouty in its character, the iodide of potash is to be preferred, as, though less rapid, its action is more permanent. The iodide does not require to be given in larger doses than two or three grains every night or every twelve hours, but it ought to be persevered with for some time. Combined with twenty grains of bicarbonate of potash it forms one of the best remedies for the relief of high blood-pressure having a gouty origin. Where there is a tendency to cardiac failure, the addition of an appropriate dose of digitalis enables the heart to rally and restores its tone, a result which digitalis alone is unable to effect as in these circumstances it is apt, apart from the iodide, to produce cardiac irritation by goading the heart to useless exertion in the face of an obstacle it is unable to overcome. Larger doses of the iodide than two or three grains twice or three times a day are quite unnecessary and they may even do harm by destroying the albuminates in the blood, and so interfering with the nutrition of the heart, that organ being the most sensitive of all in regard to its metabolism. Throughout the literature of cardiac disease there are many cases recorded of extreme and distressing cardiac irregularity at once relieved by a fit of gout; all of these would no doubt have been just as well and as speedily cured by the use of colchicum; this is a matter not to be lost sight of. A mild course of anti-arthritic medication is often of the utmost service, and it may very readily be combined with other remedies, especially with digitalis.

Where a thorough alkalizing of the contents of the primæ viæ

is desired, two or three bottles of Vichy water are very effectual, taken one small tumblerful before breakfast on first rising, and another about an hour before dinner.

Flatulence is occasionally in itself a most distressing part of the ailments accompanying the senile heart, and even when it exists to but a limited extent it often distresses and alarms by its action on the heart, producing intermission, irregularity, or even severe attacks of *tremor cordis*. Even when a flatulent stomach does not give rise reflexly to these symptoms, it often produces them directly by pressure on the heart when the patient stoops, and this is perhaps as alarming an accident as could happen to anyone. In apparently perfect health he stoops to pick up a pencil or to tie his shoe, and his heart suddenly runs off in a fit of irregularity or of tremor. If there is any time in one's life when it is permissible to take a dram, surely this is one, and we have the authority of popular experience in its favor, for "there's naething like a wee drap speerits for congealed wind"— imprisoned flatulence. Accordingly, to those subject to these attacks I permit a small flask containing about a glass and a half of brandy or whisky for the day's consumption, in occasional sips as required, and not to be exceeded. Besides this, of course, the patient must be carefully dieted, and have with each meal some pepsin. I prefer one of the acid solutions of pepsin, which combines excellently with the liquor strychninæ and arsenic, forming an admirable tonic both to stomach and heart."

Collinsonia is an excellent medicament for intestinal flatulence, affecting the heart; so, also, is lycopodium, oleum cajuputi, and asafœdita, and terebinth has given relief in severe cases.

"Such, then," says Balfour, in concluding his paper, "is the armamentarium most useful in senile heart troubles. They are all valuable remedies in suitable cases, for though some of them are interchangeable, yet each has its own peculiar mission for which it is best adapted. Each case must be carefully considered from every point of view, thoroughly individualized, and the treatment best adapted to attain the end in view carefully and firmly laid down and persistently carried out. A disease which has been gradually coming on for thirty or forty years cannot be expected to be remedied in a week or two; it often takes many months of care before irregular hearts are made regular, or the declension of a failing heart is

arrested. With time, however, all this can be done; time, however, is required, for it is not to be done by any dextrous legerdemain, but by the skillful imitation of natural processes and by the steady accumulation of trifling advantages, and our drugs must be mixed, like Opie's colors, 'with brains.'"

PAIN IN THE HEART.

"Very often," says Dr. Shrady in the "Medical Record," "pain experienced by those suffering from heart lesions is due to pleuritic trouble, to the rheumatic diathesis, or to some functional nervous disturbance. At the same time pain in the left half of the thorax always suggests a possibility that its relation to cardiac abnormity is more than coincidence. The "Lyon Medical," November 1, 1891, quoting from another journal, gives in substance Dr. Nothnagel's recent contribution upon this subject, based upon the study of 483 cases, all neuropathic, painful precordial affections and pericarditis being excluded. Cardialgia is of extreme frequence in aortic insufficiency and stenosis, and rare in mitral regurgitation. Leaving out schlerosis associated with obliteration and stenosis of the coronary vessels, the author finds that in musculo-cardiac defects pain is frequent only in arterio-schlerosis with hypertrophy of the heart. The clinical aspect in this case is identical with symptomatic cardialgia associated with valvular disease. The pathogenesis of this pain is not discussed, our knowledge of the heart's nervous mechanism being as yet too circumscribed for the establishment of any theory. The extreme frequence of cardialgia in aortic affections seems to indicate that its origin lies in the artery itself. Diseases of the arteries are always extremely painful. This accords with the fact that in cardiopathics in general there are frequent lesions of the coronary vessels."

But recent autopsies of persons dying from angina pectoris have shown that no abnormal condition appreciable to the eye existed in the coronary vessels.

Writing again of "Heart Pain," the same writer in an editorial says:

"The statement is often made to patients who complain of pain about the heart that it is due to the pressure of the stomach when dis-

tended with food or gas. It is unquestionably true that many who think they have heart disease are in reality dyspeptics, but it is equally well known that many conditions produce painful sensations of various kinds in the heart itself, and when intercostal neuralgia, myalgia, or muscular rheumatism of the chest-wall, cutaneous hyperalgesia, and localized pleuritis have been eliminated, there still remains a considerable number of causes for pain in the heart region.

"Nothnagel has recently made the attempt to show the causal relation between cardiac pain and actual disease of the organ, and has tabulated nearly five hundred cases of valvular disease with this object in view, excluding neuroses with precordial pain as well as instances of pericarditis. The result of his study of the question, which is published in the "Zeitschrift für Klin. Med.," shows cardialgia to be frequent in cases of insufficiency and stenosis of the aortic orifice, while it is extremely rare in insufficiency of the mitral. Sixty per cent of regurgitation in the former were found to be accompanied by pain, while only seven and a half of the latter cases had painful sensations. Hyperalgesia of the skin localized over the region of the heart, even in the absence of spontaneous pains, was observed in a number of subjects. Attention is also called to the frequency of pain in disease of heart muscle, without concomitant valvular implication as in simple myocarditis, fatty heart, cardiac hypertrophy, etc.; but the cardialgia in these special cases has nothing especially characteristic about it, and is only frequent in instances of arteriosclerosis with hypertrophy. The obscurity which involves the whole subject of the heart's nervous system prevents the author from entering upon a discussion of the pathology of these various pains, but he regards them as of much importance in the diagnosis of obscure cases.

" Dr. Liegeois has recently reported to the ' Société de Thérapeutique ' several observations on the effect of the tincture of piscidia erythrina in certain heart pains, and has been led by his own experience with the drug to regard it as a good analgesic in the more or less permanent pains of vascular cardiopathies. The effect of the remedy is said to be more analgesic than hypnotic, and it produces no gastric disturbances. It is said that its active principle, piscidine, slows the heart's action and lowers the arterial pressure. It is very necessary to have a tincture prepared properly and not too long before-

hand, as it does not keep well. The formula which the writer especially recommends is as follows:

℞ Tinct. piscidæ erythrinæ . . . . . gm. 60.
Tinct. verat. virid., ... —. —.
Ext. aconiti rad. alc. . . . . aa. gm. 15.
S.: Thirty drops morning and night.

It is greatly to be hoped that piscidia may prove a more valuable remedy for the relief of pain about the heart than many others which have been recommended for this purpose. Some of these painful sensations are very distressing to the patient's mind as well as to his body, and are not usually relieved by the remedies which influence beneficially the action of the organ."

It always has appeared singular to me that a physician could have the effrontery to combine such drugs as the above—all known to relieve heart-pain—and then boldly declare that one of them, and that one of doubtful value, to be *the* drug which was efficacious. Such testimony is of no value.

Dr. Samuel C. Chew, of Baltimore, recently read a paper before the Association of American Physicians on "Different Forms of Cardiac Pain." He opened his paper with the remark that cardiac pains were due to several affections which differed from one another both in nature and pathology. They were situated apparently, or actually, in the heart. We had no proper term by which to designate cardiac pain. The three divisions which he considered were true angina pectoris, which occurred in paroxysms, at first, at least, was accompanied by increased arterial tension, and was usually associated with aortic or coronary disease, or fatty degeneration of the heart. The pain was a peculiar one, being really something in addition to a pain, a feeling of impending death. Of two pathological conditions, coronary obstruction and fatty degeneration, we could only suspect their existence during life. Hence, the prognosis might be equally grave, whether an organic lesion of the heart was or was not recognized. Like in the other forms, it was difficult to determine the exact relation between the symptoms and the lesion. The immediate cause seemed neurotic. In this form he had obtained the greatest relief from the paroxysms by the nitrites, especially nitrite of amyl. Closely allied with this type was the cardiac pain associated with Bright's disease. Here the iodide of potassium in large doses might sometimes ultimately prove beneficial by lessening the arterial

sclerosis. Nitrite of amyl again might relieve the pain. The third form considered occurred in dilatation of the heart, and it was attributed to stretching and pressure upon the nerves. One of the best tonics was arsenic.

Dr. A. M. Starr, of New York, in the discussion of this paper, mentioned two other cases of cardiac pain, namely, that occurring in connection with paroxysmal tachycardia, and the other in what he had termed the vaso-motor type of neurasthenia. He also referred to Nothnagel's article showing that the statement usually made, that cardiac disease was unaccompanied by pain, was an error.

Dr. Musser, of Philadelphia, insisted upon rest and careful attention to diet.

Dr. McPhedran had found nitro-glycerine preferable to nitrite of amyl, and said its effects were more lasting.

Dr. Stockton had often found cardiac dilatation at autopsy in which there had been no history of cardiac pain.

Dr. Chew thought that nitro-glycerine was useful for preventing attacks, but not for relieving them after they had come on.

Dr. Stockton related a case in which large doses of nitro-glycerine (half grain) relieved the paroxysm, while nitrite of amyl failed.

Patients are frightened by pain in the left side in the region of the heart, when they are indifferent to pain in the right side.

Our school, which selects our medicines symptomatically, is much more successful in relieving supposed cardiac pain. We have in arnica, cimicifuga, cactus, bryonia, rhus tox., spigelia, ranunculus, senega, and other drugs, excellent remedies for these pains. Phenacetin will cure more cases of cardiac pain than any other drug. If the pain is a chronic neurosis no drug equals arsenic, long continued, for weeks or months.

ANGINA PECTORIS.

This affection is sometimes called steno-cardia and breast-pang. It is not an independent affection, but a symptom connected with several diseases of the heart and blood-vessels, especially with changes in the coronary arteries and sclerosis of the roots of the aorta. True angina is a rare disease. It is characterized by paroxysms of excru-

ciating pain in the region of the heart extending into the arms and neck, and occurs almost exclusively in men of adult age. The real pathology is yet uncertain. In most cases there is present aortic insufficiency, increased arterial tension, hypertrophy of the heart, or arterio-sclerosis. The immediate causes of an attack are generally sudden exertion, or emotional excitement. The paroxysms often occur at night, but may appear in the daytime. I have seen two cases where it invariably occurred after smoking a strong cigar.

Several theories have been advanced as to the nature of the affection, namely: (1) Neuralgia of the cardiac nerves. (2) Heart cramp. (3) Extreme distension of the ventricular walls. (4) Sclerosis with narrowing of the coronary arteries. (5) Vaso-motor spasm of the coronary or the peripheral arteries.

I believe it may be caused by each of the above conditions, and perhaps others not yet mentioned.

Symptoms.— In true angina the patient is suddenly seized with an agonizing pain in the region of the heart, and a feeling of constriction as if the heart was seized in a vise. Then pains radiate up the neck and down the arms—generally the left—and there may be numbness in the fingers or in the cardiac region. The face becomes cold, pallid, ashy gray, covered with a cold sweat which may extend all over the body. Actual dyspnœa is not usually present in true angina. The paroxysm may last several seconds or a minute or two, during which the patient feels as if death was impending. The patient may drop dead at the height of the attack, or pass away in syncope. The condition of the heart during the attack is variable. Strange to say its beats may be uniform and regular, and even the character of the pulse may be normal. After the attack the patient feels exhausted and suffers as after a severe fright. Eructations and passage of large quantities of clear watery urine are common. He may rally in an hour or two and feel quite like himself, or be confined to his bed for several days. The attacks may occur every few weeks, or not for years, and during the intervals the patient may feel quite well.

It is sometimes difficult to diagnose true from false angina pectoris. The subjective symptoms do not afford a trustworthy guide. We must rely upon an examination of the circulatory system. Even in mild forms of true angina signs of arterio-sclerosis are usually

present. If on auscultation the aortic second sound is clear, not ringing, the pulse tension is low, the peripheral arteries soft, and the pulse compressible, the case is not one of true angina.

False angina is a common affection in nervous women. It is generally hysterical and the vaso-motor symptoms clearly present. Hysteria simulates true angina as it does many other severe disorders. Dr. Huchard has given us the following concise points of diagnoses between the true and false angina.

"True Angina.	Pseudo-Angina.
Most common between the ages of forty and fifty years.	At every age, even six years.
Most common in men. Attacks brought on by exertion.	Most common in women. Attacks spontaneous.
Attacks rarely periodical or nocturnal.	Often periodical and nocturnal.
Not associated with other symptoms.	Associated with nervous symptoms.
Vaso-motor form rare. Agonizing pain and sensation of compression by a vise.	Vaso-motor form common. Pain less severe; sensation of distension.
Pain of short duration. Attitude: silence, immobility.	Pain lasts one or two hours.
Lesions: sclerosis of coronary artery.	Agitation and activity.
Prognosis grave, often fatal.	Neuralgia of nerves (?) and cardio-plexus. Never fatal.
Arterial medication.	Antineuralgic medications."

The pain in the left side in the region of the apex of the heart from which nervous and hysterical women suffer is often so severe as to simulate true angina, but the location of the pain and the fact that the patient is capable of agitated movements during the paroxysm shows the real nature of the paroxysm.

Prognosis. — If the patient has arterio-sclerosis or aortic insufficiency the prognosis is bad, for sooner or later death will occur in one of the paroxysms. Sometimes, however, with judicious treatment between and during the attacks a complete recovery may be obtained. Neuralgic angina may prove fatal in delicate persons with weak heart. Pseudo-angina never kills although it may make life a burden.

Treatment of the Paroxysm. — In true angina the duration of the attack is usually so brief that no medicine except amyl nitrite acts quickly enough to give relief. One to five drops of this volatile liquid, inhaled from a handkerchief or a vial, will give prompt relief. The subjects of this disease should carry with them the

perles containing a few drops of amyl. These are crushed in the hand or in a handkerchief and rapidly inhaled. In one case under my care the patient absolutely refused to have anything come near his mouth, it "suffocated him." I injected three drops mixed with ten of water under the skin and the relief was almost instantaneous. Glonoine can be administered in the same manner and will act quicker than when given by the mouth. Chloroform does not act quickly enough to arrest a paroxysm of true angina, which rarely lasts longer than a fraction of a minute. In pseudo and hysterical angina in strong girls chloroform may be given, and often arrests the paroxysm quickly.

Morphine is of no value in real heart-cramp, but is of value in pseudo-angina. I have met with several instances in women in which the pain was in the right side near the axillary line, but I am sure it was of the same nature as the pain in the left side from ovarian irritation, yet it simulated angina very closely. Some of these cases yielded in a short time to cimicifuga; others were so severe that hypodermic injection of one-eighth of a grain of morphine had to be used.

In the various forms of angina, if the heart is weak I would not advise the use of phenacetin. In all other instances I value it highly as a safe and efficient remedy. In mild cases a grain every half-hour will suffice. In severe cases one or two doses of five grains rarely fails to relieve. It is unfortunate that this useful medicine cannot be given hypodermatically on account of its insolubility. (For further treatment consult article on arterio-sclerosis.)

General Treatment. — In all forms of angina the patient should lead a quiet life, avoiding all mental excitement and sudden severe physical exertion. If arterio-sclerosis is present the diet and regimen should be regulated (see article on arterio-sclerosis). There are a few medicines which appear to have an influence in arresting or retarding the progress of degeneration going on in the arteries. Dr. Huchard, of Paris, France, finds that the iodides have this power if their use is prolonged. He prescribes twenty grains three times a day for several years, omitting the medicines for ten days in each month. He cites the cases of two men both with arterio-sclerosis, ringing accentuated second sound, and attacks of true angina, who under its use remained practically free from attacks, one case for

nearly three and the other for fully four years. In one case of my own the patient was made nearly free from attacks by the use of ten grains of iodide of sodium thrice daily for two years. Not all patients are tolerant of the drug nor does it always bring about improvement. Osler says he has had several patients who were not at all improved by the iodides. Some patients may be intolerant of one iodide and tolerate another. Iodide of potassium acts best in persons of strong muscular development. If the muscles are weak, iodide of sodium acts better. The iodide of strontium acts well in patients with delicate stomachs, and possesses the advantage of not causing acne.

Aurum is an excellent remedy in arterio-sclerosis in which there is an element of vaso-motor constriction. The chloride of gold and sodium or the iodide of gold has in several cases given me good results. The dose is three to five grains of the 2x (1-100th to 1-30th of a grain) three times a day. It should be continued for many months, with intervals, especially if pathogenetic symptoms appear.

Glonoine (nitro-glycerine) is not only a valuable palliative in angina, but is of great value during the interval. I refer to its physiological action. In doses of 1-100th or 1-50th of a grain it relaxes the arteries even in arterio-sclerosis. In doing this it relaxes the heart-muscle and prevents heart-cramp. The dose should be sufficient to give a soft large pulse, without causing disagreeable headache. In some patients this result can be obtained with 1-200th of a grain every four or six hours. Others require one-fiftieth of a grain, and several cases are reported requiring and tolerating one-half of a grain. It can be given with other medicines and does not seem to antagonize them. If these medicines fail to cure or cannot be taken there are several possible remedies which should be tried according to the law of *similia*.

The poison of lachesis, naja, the scorpion, latrodestus, and some other venomous reptiles, cause attacks similar to angina pectoris. The sting of apis and some other insects have also caused pain and constriction in the region of the heart.

The provings of latrodestus give some very characteristic symptoms. Dr. E. H. Linnell, of Norwich, Conn., reports the following case treated with it:

"S. L. G., a man fifty years old, of bilious temperament, a dentist by profession, had slight attacks of angina after severe exposure

and over-exertion during the 'blizzard' in March, 1888. He did not consider them of sufficient importance to consult a physician about them, but some months later, he had a suppurative prostatitis, which was followed by considerable prostration, and the attacks of angina became very severe. I never could get a satisfactory description of the character of the pain, and I never saw him during a paroxysm. The pain was brought on by exertion of any kind, and was especially frequent soon after dinner. The pain was sometimes felt in the left arm, but was usually confined to the cardiac region. I once or twice detected a slight aortic obstruction sound, but aside from this failed to find any evidence of organic disease. The usual remedies gave no relief, but latrodestus 3c. was of great benefit. Under its use the attacks gradually became less frequent and less severe. He has taken no medicine now for at least six months, and he tells me that although he occasionally has a little reminder of his former trouble, the attacks are so slight that he pays no attention to them. I have given the remedy in another similar case, with even more gratifying success. The attacks were very promptly arrested and have not returned, although nearly a year has elapsed."

Cactus grandiflorus takes the front rank as a homeopathic remedy in angina pectoris. It may not influence well-developed sclerosis of the arteries, but is perfectly indicated in vaso-motor, neuralgic, and pseudo-angina. The characteristic symptoms are the constriction of the heart, "as if with an iron band," and a tenseness of the pulse with narrowing of the arteries. All the cacti which have been proven show this symptom in a greater or less degree. Anhalonium, probably the most poisonous of all, ought to be equal to cactus. The dose should not exceed the 1x dilution (one-tenth of a drop) every four or six hours in the intervals; during an attack every five minutes. Arnica is indicated when the attack arises from sudden strain, as in lifting. If the patient will keep quiet for a few days arnica will prevent further attacks.

Rhus tox. ought to be useful under the same circumstances.

Coca and cocaine have produced symptoms similar to angina pectoris. Several persons have died under its toxic effects, presenting such symptoms. Struggling for breath, with cold, clammy extremities indicate its use.

A few drops of the tincture of coca every ten minutes, or the 2x trituration of cocaine, is the proper dose.

Quebracho or its alkaloid aspidiospermine is indicated for the same symptoms, and in the same or somewhat larger doses. It is especially useful when walking brings on the intense dyspnœa and constriction of the whole thorax.

The old school unanimously assert that all the cardiac tonics — digitalis, convallaria, adonis, nux vomica, strychnine, oleander, and others are not to be given in the treatment of angina pectoris. They declare rightly that they are dangerous. The reason lies in the fact which they are cognizant of, that all such medicines produce similar symptoms by causing vaso-motor constriction and violent contraction of the heart-muscle.

Now if any of these cardiac medicines are indicated by the symptoms they will be useful in all forms of angina pectoris except in advanced arterio-sclerosis. The dose should be small, never exceeding a drop of the 1x dilution. Several other medicines have been recommended for angina, among them aconite, iodide of arsenic, asafœtida (hysterical), cimicifuga, cuprum, lilium, moschus, kalmia, spigelia, tobaccum, and veratrum album. Of these cimicifuga is useful in spurious angina from a reflex of uterine or ovarian disorders. Lilium ought to be of value in the same conditions, but I have serious doubts of the trustworthiness of its provings.

The phosphide of iron, of magnesium and of potassium are recommended by Shüssler for angina pectoris, but there is nothing in their provings that warrants their use, and his so-called biological indications are purely theoretical. No clinical verifications have yet appeared that would warrant their use in this disease.

Some empirical remedies have been recommended. Dr. Henning says he gave œnothra biennis to an old man with angina; "twenty drop doses gave him prompt relief."

Piscidia (Jamaica dogwood). — Several reports of its successful use in angina have appeared. It is recommended as a substitute for glonoine. The dose is from ten to thirty drops. I doubt its value in true angina, but it may be of value in pseudo or hysterical cases. Belladonna, hyoscyamus, solanun, lobelia, or iberis may be useful in some instances.

THE HEART IN PNEUMONIA.

In all acute pulmonary affections, the condition of the heart should be closely watched and studied, for it is a matter of the highest importance, and much of our success in the treatment of these diseases depends upon the condition of the heart.

In the beginning of acute pneumonia, the heart may be sound and strong, but as the disease progresses, we soon observe symptoms of obstruction of the pulmonary circulation. Those who are familiar with the pathology of inflammation of the lungs are aware of the causes of this obstruction, and I need not enumerate them.

If the heart has been previously diseased, with valvular lesions or their consequences, or if there is fatty degeneration, or thinning with dilatation, then the pulmonary obstruction affects the whole heart, and comes on much sooner than if the patient had a sound heart to begin with.

This is the reason why pneumonia is so much more severe in persons who have heart lesions, or disorders characterized by weakness of the myocardium, and a neglect of this fact is the cause of much fatality which could be prevented.

So soon as obstruction of the pulmonary circulation occurs in patients with a previously sound heart, the *right* heart is the side that suffers, for its labor is greatly increased. In proportion to its inability to overcome the obstruction, there will be an accumulation of blood in the venous system. Excess of blood in the veins implies deficiency in the arteries, and hence all acute pulmonary inflammations are characterized by an unequal division of the blood between the venous circulation and the arterial.

"This condition," writes Dr. A. H. Smith ("Amer. Jour. Med. Sciences"), "has extremely important consequences, especially in acute pulmonary affections. In these we study the pulse with the greatest solicitude to judge how the heart, as we say, is supporting the struggle. But the arterial pulse gives no indication of the immediate peril, for it is not the left heart that is bearing the brunt of the battle. The pulse tells its story only at second hand. It may be small and weak, but it is chiefly because the left heart does not receive enough blood from the lungs to fill its chambers and to distend the arteries.

"The trouble is not in lack of propelling power so much as in deficiency of blood to be propelled. But if, instead of feeling the radial pulse, we could lay our finger upon the pulmonary artery we should obtain information vastly more to the point. We should then be able to appreciate the degree of pulmonary obstruction by the fulness of the vessel, and to rate the power of the right ventricle by the force of the arterial beat. And in the relation of these two factors one to the other is involved the issue of the case. Increasing obstruction with decreasing right heart power means death; decreasing obstruction with sustained right heart power gives promise of recovery. It is a question with which the left heart, and, therefore, the radial pulse, has almost nothing to do. For the peril is not from general exhaustion, as, for example, in fever, nor from failure of the heart as a whole, as in some cases of infection, but specifically from tiring out of the *right* heart in its effort to unload the venous circulation through the obstructed vessels of the lungs.

"Now, while we cannot place our finger upon the pulmonary artery, we can obtain nearly the same information by applying the stethoscope over the pulmonary valve. Owing to anatomical conditions which it is not necessary to describe, it is entirely practicable to separate the pulmonary valve sounds from the aortic, and by means of auscultation to study the peculiarities of the former as indicating the conditions of the pulmonary circulation. Unfortunately, however, in some cases the valve sounds are masked by bronchial râles, so that it may be impossible to appreciate them accurately. But even in the most rapid breathing there are brief intervals, during which the practiced ear may nearly always gather the required information. Now, if we note carefully the sound of the pulmonary valve in, for example, a case of pneumonia, we shall find that at the outset, while the right ventricle is still in vigorous action, this sound is especially clear and sharp, indicating a quick and strong recoil of the pulmonary artery following the ventricular systole. This sharp recoil is due to unusual distension of the vessel, and this in turn is due to the resistance which the blood meets in passing through the lungs. If the case is to terminate favorably, this accentuation of the pulmonary sound will probably continue through the whole course of the disease, becoming less marked as the obstruction in the lung deceases.

"But in cases of increasing severity, and with an unfavorable tendency, a time soon comes when not only this accentuation is lost, but the normal intensity of the valve sound is lessened, the sound becoming weaker and weaker, until it ceases to be heard. This means, not that the obstruction has become less, but simply that the muscular power of the right ventricle has become exhausted with the labor exacted of it. The blood is no longer driven into the artery with sufficient force to distend it, and there is not enough recoil to bring the valve cusps together with an audible sound. When this point is reached, the end is not far off. The weakened right heart favors still greater pulmonary obstruction, and this in turn adds to the burden of the right ventricle, thus completing the vicious circle. The struggles of the ventricle become feebler and feebler, while the tension within its cavity constantly increases, as the blood presses into it from behind. At last there comes a moment when the overtaxed muscle cannot summon the energy for another contraction, and its action ceases in diastole.

"The steps which lead up to this result are in a great degree traceable by symptoms and by physical signs. First of all, there are auscultatory and other signs of pulmonary obstruction; then come signs of general venous congestion. The distended right auricle may be traceable by percussion, or even may be seen pulsating at the right of the sternum. An increased area of cardiac dulness extending toward the xiphoid cartilage indicates the repletion of the right ventricle, and, in spare subjects the labored beating of this may be felt by pressing the finger under the costal cartilages. The tense hard pulse of inflammation is replaced by the small, creeping pulse of arterial depletion. The superficial veins are seen to be unusually prominent and the liver is enlarged. The spleen also is increased in size, and evidence of intestinal congestion may be afforded by copious diarrhœa. Proof of passive hyperæmia of the kidneys is found in lessened excretion and albuminuria. Thus, all things combine to indicate a general preponderance of blood in the venous side of circulation, the result which we should naturally expect from a retardation of the blood in the pulmonary vessels."

Dr. A. H. Smith, whom I have just quoted, discusses the method of treatment of this accumulation of blood in the venous system. "Manifestly," he says, "it is to diminish in every safe and proper

way the disparity between the venous and the arterial supply." He admits that the former method of venesection only resulted in temporary relief. Withdrawing a large amount of blood from the venous system would naturally give relief to the congested lungs and give a brief respite to the overworked right ventricle. He believes that the beneficial effects of bleeding can be obtained by other and less objectionable means. He dwells upon the importance of regulating the quantity and quality of the diet in reference to the changed conditions of congestion and hæmatosis. He believes more food is usually given than is beneficial or necessary. An excess of food increases the venous congestion. It gives rise to flatulent distension, rendering respiration more difficult, and there is also the risk of loading the blood with more nutritive material than the imperfect respiration can act upon in the process of sanguinefication. I believe he is right, for I have observed that under a diet of beef-tea and albuminous foods the respiration became more oppressed, and the action of the heart more labored. I would suggest that those substances be banished from the dietary, until convalescence is fully established. Milk may be given, but not in large quantities. It should be mixed with half its bulk of Vichy, seltzer or some alkaline water, and well shaken before swallowed. If we have the slightest doubt of its purity, it should be sterilized. Pure soft water should be allowed *ad libitum*. If diarrhœa is present, mix the milk with lime-water or rice-water. If there is constipation, with farina gruel. These foods are all-sufficient until the right heart has ceased to be overworked. Dr. Smith is in favor of the use of alcohol, which he declares is a *food* when given in a reasonable quantity; not after the method once so much in vogue with English physicians, who often gave it to the verge of intoxication, but only enough to "*relax the arterial system.*" In this respect, I believe he is right. It does not require more than a few fluid drachms a day to get this effect. But instead of using brandy, whisky, or the heavy wines, which are rarely pure, I prefer the purified alcohol. Of the above, good old whisky is doubtless the best. Nor would I give sweet wines; the dry wines are far more readily assimilable. I prefer a good *sauterne*, and I can recall many cases of pneumonia in delicate women and children, to whom I allowed a pint daily of this wine, mixed with equal parts of pure water or Vichy, with the happiest results. In

children and delicate women, wine-whey, made with sauterne or hock, acts admirably. When the nervous system is greatly depressed and there is delirium, with trembling, we can use alcohol liberally, with the greatest benefit.

But there are some of the newer medicines which act similarly to alcohol on the vaso-motor system, and I have used them for years when I desired to get rapid relaxation of the arterial system. I refer to amyl nitrite, nitroglycerine (glonoine), and the nitrites of sodium and potassium. When any of these drugs are given in minute doses, by their specific effects, either upon the vaso-motor system, or directly upon the muscular fibres of the arteries, they cause a relaxation, and consequent dilatation of the whole arterial system. This gives great relief to the over-distended venous system.

In conditions of sudden collapse from over-distension of the right heart, I am certain I have saved the patient's life by a few inhalations of amyl, or a hypodermatic injection of glonoine, one-fiftieth of a drop.

The effect is startling. The blue and cold lips, face, and hands in less than a minute become suffused with red blood, and the fluttering or absent pulse becomes full and strong. The effects of these two agents are evanescent, and we must repeat them often. Amyl should be used only in cases of great emergency, and should be followed in a few minutes by glonoine, whose effects last an hour or two. The action of the nitrites of soda, potash, and ammonia last longer, for hours, and can be given in doses ranging from one-tenth to one grain. Probably the nitrite of ammonia is the best, for it remains stable in an aqueous or dilute alcoholic solution in which there is one per cent of free ammonia. The one per cent solution, in doses of ten drops up to one drachm, can be given with signal advantage.

But there are other drugs, which have long had a deserved popularity in pneumonia, which act in a matter similar to the nitrites. Aconite and veratrum viride are the most potent of these. But they do not act alike. Aconite is indicated when the action of the heart is rapid and its contractions short, sharp, and labored. Veratrum, when the heart beats powerfully, with heavy, bounding impulse. Aconite is indicated when the pulse is quick, hard, and small, the artery vibrating like steel wire under the pressure of the finger. Veratrum,

when the pulse is large, hard, and vibrating, denoting violent, forcible impulse of the heart against a powerful vaso-motor spasm of the arteries.

I am sure that in the hands of those who know how to use these powerful drugs, pneumonia has been averted in its first stages. I believe I have used them with that result many times, but I do not believe the attenuations can be used with such results. However successfully they may be used in ephemeral and catarrhal fevers, when given in attenuated doses they are useless in the onset of pneumonia. Tessier did not shorten the average duration of a single case under the administration of the 15th dilution of aconite. The curative dose in acute pneumonia lies in the first decimal dilution, in one to ten drop doses, of either drug, repeated every hour or two. There is not the slightest danger, even in children, from the use of these doses. I once gave veratrum viride to a child of two years with acute lobar pneumonia, with the characteristic pulse, and a temperature of 104° F., in doses of one drop of the tincture every hour, with the result of bringing the pulse to normal (96), and the temperature to 99° in twelve hours. Phosphorus and tartar emetic completed the cure in five days.

There is another effect belonging to the action of aconite and veratrum viride, which is of great value in pulmonary inflammations. Their sedative effect on the heart itself is undoubted. When the proper dose is given, the heart's pulsations are always rendered slower and weaker. Here I will call attention to the antagonistic properties of aconite and veratrum, as compared with digitalis and ergot. The latter *contract* the arterioles, *slow* the action of the heart, but *increase its force.* If we were obliged to select drugs which are primarily homeopathic to the stage of obstruction and venous stasis in pneumonia, we should select digitalis and ergot, and use them in the high attenuations; but I am not aware that this has ever been done, nor do I believe the result would be to remove the obstruction.

There are some facts which seem to prove that the secondary effects of aconite and veratrum would be to cause a condition of the heart and arteries simulating obstruction, but I prefer to believe that their action in dilating the arteries and in decreasing the force of the heart to be purely physiological. I believe that by this action, when carried only far enough to relax the arterioles, decrease the force of

the heart and lower the temperature, we are able to prevent the obstructive state.

But suppose we are not able to do this, and we find the patient presenting the signs and symptoms of obstruction mentioned by Dr. Smith? Then, we should not give aconite or veratrum, but resort to medicines which will dilate the arterioles, and allow the arterial blood to pour into them, taking off the excess of blood in the right heart.

In this stage we must rely, in addition, on those medicines which are homeopathic to the inflammatory process going on in the lungs. Phosphorus, tartar emetic, and sanguinaria are a powerful trio in such cases, when given according to the indications so well known to our school.

Phosphorus is of the greatest importance when the *right* heart is almost paralyzed and collapse threatens. Given in alternation with glonoine, its power is heroic in saving the patient from dissolution.

The question as to the use of digitalis and its analogues, strophanthus and strychnine, in the stage of pneumonia with threatened heart-failure, is open to discussion. Dr. A. H. Smith advises against their use, which he declares to be unsafe. They act chiefly on the *left* side of the heart, which is not the side which fails. Bristowe mentions that in many cases of death in pneumonia the left ventricle was found firmly contracted, while the right was distended by a clot which extended into the pulmonary artery.

Why are not the arseniate and the iodide of antimony more used in acute and chronic pulmonary troubles? In the obstructive stage, when the respiration is labored and the left heart is weak, with coarse râles and inability to expectorate, the arseniate is admirably indicated. In the stage of gray hepatization, when the bronchi are filled and obstructed and the dyspnœa great, the iodide should be used.

Chloroform has a close analogy to the glonoine and the nitrites. The "sweet spirits of nitre" is a nitrous ether, and acts like a nitrite. Hahnemann recommended this preparation in about the same condition for which we use glonoine. I have always got the best results from phosphorus in pneumonia and typhoid fever when the tincture

was prepared with chloroform. In pneumonia, in the obstructive stage, give the 3d dil. in chloroform, two to five drops in a spoonful of water, and you will be pleased with the effect.

Sanguinaria is a rival of tartar emetic in the severest cases of pneumonia, and in chronic cases no remedy equals it. Chelidonium is a near botanical relative, and it contains some of the constituents of sanguinaria. Moreover, there is a close similarity in their symptoms.

Certainly in the condition described by Dr. Smith, quoted above, digitalis could not safely be given. Yet many physicians of both schools assert that when the heart flags and the pulse becomes weak and irregular, they use digitalis with decided benefit. Many of late praise strophanthus highly in similar conditions, especially in the inflammatory affections of the lungs in children. Others praise strychnine when paralysis of respiration threatens, and the breathing becomes shallow and labored. There must be conditions in pneumonia when the typical obstructive stage does not obtain; conditions where the whole heart becomes weak and failure of both sides is impending. I know that I have had good results from all three drugs in many cases, and I would not like to give up their use.

Probably we shall be able to select those cases where the nitrites, glonoine, amyl, and chloroform should be given by the indications laid down by Smith. I refer to the condition of the pulmonary valve, as shown by the stethoscope, namely: when the normal *intensity of the pulmonary valve sound becomes weak or imperceptible.* If we do not find this indication, but find the pulse feeble, irregular, or intermittent, the surface of the body cool, the extremities cold and damp, and the general heart-sounds feeble, then we may safely give digitalis or strophanthus, with phosphorus or arsenic, or arseniate of antimony. In addition to their cough, chest, and febrile symptoms, the state of the heart is often a guide to their administration.

Sanguinaria is indicated when the heart's action is low and labored, the pulse slow and full, and generally irregular; or in severe cases when the pulse is slow, small, and feeble.

Chelidonium is indicated when the heart's action is labored and its action is felt through the clothing. If jaundice sets in the pulse becomes slower, and possibly feeble.

Phosphorus has a small, feeble, and irregular pulse, like one in collapse. Tartar emetic has about the same indications. Both are useful when the right heart is overtaxed.

Turpentine has many points of resemblance to phosphorus. In cases of poisoning by both, the pathological conditions of all the important organs are similar. Tympanites and diarrhœa are arrested by both, but I prefer turpentine for these symptoms. When given by the mouth, or by enema, or applied to the abdomen, it generally gives quick relief. In many cases of collapse in pneumonia, when the respiration and heart's action seem on the point of failing, large doses of turpentine have had an undoubted effect in stimulating both to renewed functional activity. Especially in children does this remedy act well; they are often killed by the mechanical result of a tympanitic abdomen pressing up the diaphragm and arresting the action of the overtaxed heart.

Recently Dr. J. West Roosevelt read a paper before the Practitioners' Society of New York on "The Use of Heart Stimulants," particularly strychnine, in the treatment of acute lobar pneumonia. He said:

"That death in a large number of cases of acute lobar pneumonia is directly caused by the exhaustion of the heart which the disease-process produces is generally admitted. It is well known that patients suffering from this malady are very prone to syncope upon slight exertion; indeed, a number of cases are on record in which sudden death has followed the effort to sit up in bed for the purpose of facilitating the physical examination of the chest. In a considerable number of cases death takes place very suddenly, as it sometimes does in pleurisy with effusion, from syncope not caused by muscular exertion. In still others œdema of the lungs precedes the fatal issue. In all these cases it is the heart failure which kills. With the causes of this failure we have but little to do in the present paper. It is my desire to speak only of certain clinical phenomena, not to discuss theories.

"Acute lobar pneumonia is a self-limited disease, which usually terminates by crisis within ten days. In very many cases, sooner or later the heart becomes weak, and in fatal cases death often results from heart failure. Sometimes the heart weakness is manifest at the beginning of the disorder, but more often it only becomes evi-

dent after the illess has lasted several days. It is very apt to be pronounced about the time the crisis is generally to be expected, and death is very common at this time (*i. e.*, between the sixth and tenth days). The disease is of short duration; if the heart can be forced to act for a few days recovery may be expected, and there is reason to believe that judicious treatment with cardiac stimulants can save many lives. The principal stimulants commonly used in pneumonia are alcohol in some form, digitalis, convallaria, and strophanthus, either singly or in combination, caffeine, ammonium carbonate, some of the nitrites, opium, musk, or nux vomica. There are, of course, a number of other heart stimulants; but the ones mentioned are the most important.

"*The Indications for Stimulation.* — There is, it seems to me, a good deal of difference of opinion as to the indications for exhibiting stimulants. On the whole, are we not apt to use them before the patient's condition demands them? (It will be understood that I speak of the drugs named only as they are employed for the purpose of "stimulation" in the clinical meaning of the word.) There is an idea which has been often set forth, and which is often applied to-day, that it is right to stimulate in all cases where there is reason to expect weakness of the heart to result from some acute disease long before such weakness becomes manifest. Syllogistically expressed in regard to pneumonia, it is: "Heart-weakness may be expected to result from the disease within from twenty-four hours to ten days; therefore, let us forestall it by immediately giving stimulants, regardless of the present condition of the heart." This is the actual practice of many. It would be as rational to say to an athlete, "You are to be submitted to a severe strain in a short time; you had better take a good deal of liquor." The athlete knows that to take stimulants in order to prepare for some strain upon his muscles which is not imminent, is folly. The heart is a muscle, and to stimulate it needlessly is to exhaust it. The need for stimulation is determined by the actually existing condition of the circulatory system, not by some condition which may obtain in the future. If a patient with pneumonia has a good pulse and shows no evidence of imperfect circulation, it is worse than folly to stimulate.

"*Concerning some of the Cardiac Stimulants.*—Alcohol administered in wine, liquor, or some other solution, is of the greatest value.

It is needless to say more about it than has already been said, viz: that it is not well to give it without definite reason. In regard to digitalis, strophanthus, and convallaria, I can only say that I have never seen a single case of pneumonia in which benefit seemed to result from their use. This may be because of my limited experience, but it is a fact. Opium and morphine have both seemed to be of distinct value as stimulants in a number of my cases. Passing over the other drugs, I wish to call attention to strychnine as a cardiac stimulant.

"Strychnine has been in use for this purpose for a long time; I have not been able to learn who first recommended it. Its value does not seem to have been appreciated by the majority of the profession. While I do not pretend that it is capable of producing marvellous effects, I think it has a value which should not be overlooked. Especially is this so in patients in whom alcohol is powerless, as in old drunkards. It has seemed to me to increase the heart's strength in a remarkable way in a number of such cases. It has also seemed a most valuable drug when given in addition to alcohol in suitable cases, since it appears to increase the stimulating effects of the latter.

"*Administration and Dose of Strychnine.*—It must be given in large doses. By far the safest mode of administration is the hypodermic. Given in this way each dose exerts its influence promptly, and there is no tendency to cause the so-called "cumulative action." From one-thirtieth to one-twentieth grain may be given at a time, and the same or a smaller dose repeated every half-hour, if necessary, until the heart becomes stronger or toxic symptoms begin to appear. The limit of safety may be assumed to have been reached as soon as a distinct exaggeration of the deep reflexes appears. The way I have adopted for demonstrating such an exaggeration is very simple. It is to lift the patient's forearm, the hand being allowed to hang with the extensors relaxed, and to strike the tendon of the supinator longus. If a marked contraction of this muscle occur, it is fair to assume that the reflexes are exaggerated. Strychnine is what might be called an honest drug, for it gives warning of toxic symptoms long before the latter appear, provided it is used hypodermically.

"I repeat that I do not wish to claim for it more than a limited

range of utility, though I think that it may prove as valuable as alcohol for heart stimulation."

In the discussion which followed this paper Dr. Beverley Robinson expressed some surprise that strychnine could be given in such large doses without producing toxic phenomena, for in some patients much smaller doses had seemed to do harm by interfering with sleep and causing irritability.

Dr. George L. Peabody thought the author's experience very valuable, and that it ought to be tested by others. He fully agreed with him with regard to the impropriety of giving stimulants, especially alcohol, to a patient because his heart might become enfeebled, but was not yet so. He could not believe that such was a general practice, unless by medical tyros. He had frequently to curtail the amount of alcoholic stimulants prescribed by the house staff in hospitals.

Dr. Andrew H. Smith had been much surprised at the amount of strychnine which Dr. Roosevelt had been able to give. Such experience illustrated the fact that many powerful drugs could be given in much larger doses than had been supposed. For example, who without experience would not be startled at the amount of arsenic given by Dr. Osler, especially in pernicious anæmia: half a drachm of Fowler's solution three times a day. In giving alkaloids it should be borne in mind that they did not, as far as he knew, add anything to the nutrition of the heart-fibre. Their action was simply that of applying the whip, which might be useful in carrying the patient over a critical period, as it would be in urging a horse over a weak bridge before it could collapse. If the stimulants were used long, forcing the heart into unnatural activity, it was at the expense of molecular action and loss of strength, and was liable to bring on bankruptcy. Digitalis has never given much satisfaction in pneumonia except when the heart was becoming intermittent, when it might restore the rhythm. There was a distinction to be made between failure of the heart as a whole and failure of the right side of the heart. Right-heart failure, as distinguished from heart failure, was liable to take place when there was much obstruction to the circulation in the lungs, and ought to be managed differently from the cases in which the primary danger was to the heart as a whole. For instance, raising the patient with pneumonia, in bed, incurred risk

to the entire heart, because of its participation with the rest of the muscle in the general weakness induced by the disease. That was very different from the inefficiency of the right heart due to sluggishness of the pulmonary circulation.

Dr. F. P. Kinnicutt said he had given very large doses of strychnine hypodermically in pneumonia, with very satisfactory results. He had not, however, carried it up to one-thirtieth of a grain. If compelled to rely upon only one drug as a cardiac stimulant in pneumonia, he would choose strychnine.

I agree, in the main, with the views of the above physicians. The remedies they recommend are physiological tonics, but they act homeopathically by their similar secondary action. In some cases we will find veratrum album and veratrum viride, aconite, and cactus, equally valuable, acting homeopathically by virtue of their primary action.

ARTERIAL TENSION.

The following concerning high and low arterial tension is made up from the writings of Broadbent and others whom I have mentioned further on. I have followed Broadbent, who is the highest living authority.

HIGH ARTERIAL TENSION.

Unduly high pressure in the arterial system or high tension of the pulse is a condition worthy of careful study and attention. It explains many of the forms of failing health at and after middle age, and is often the means of shortening life through lesions of the brain and heart. It points out tendencies which later result in serious illness or fatal disease, and its recognition often directs us to measures by which ailments may be relieved, and enables us to foresee and sometimes to avert premature death.

Characteristic of High Tension Pulse.—High arterial tension is not to be measured by a certain number of grammes or ounces of pressure employed to elicit a characteristic sphygmographic trace; it is a relative, not an absolute, term. Ultimately, the measure of the tension in the arteries is the force of the systole or the heart, but modifying influences of extreme importance are introduced by the

peripheral circulation. Under normal conditions the relation between the force of the heart and the outflow by the capillaries is such that the artery gradually subsides under the pressure of the fingers in the intervals between the pulse-waves; and the chief characteristic of unduly high tension is that the vessel remains full between the beats. For our present purpose, then, it may be taken that high tension exists whenever the artery is full between the beats, so that it can be rolled under the fingers like a tendon in the wrist. To appreciate this condition, three fingers should be placed on the vessel, when it will be found to stand out not only during the wave of the pulse, but in the intervals; and, as has just been said, it can be rolled transversely under the fingers, and can often be followed for some distance up the fore-arm.

The force of the pulse-beat and the degree of actual pressure in the blood column may vary. This will be approximately estimated by the pressure of the fingers required to flatten the artery and arrest the wave, one, two, and all three fingers being employed, and the pressure being varied several times. Very frequently the force needed is unexpectedly great and a pulse which at first seems to be weak may really be extremely powerful. Not unfrequently, especially when the skin is thin, the artery can be seen to form a distinct cord-like projection along the line of its course, but no pulsation will be visible in it, unless it is thrown into a curve, when this will be seen to be accentuated at each beat. The artery may be either large or small; sometimes it is distended and dilated to its full capacity, but so long as its coats are sound and not worn out, it will usually be contracted and small. The pulsation is not very marked, and to the fingers lightly applied seems weak, since, as has already been stated, when the mean blood pressure is high, the fluctuations are comparatively small. The onset of the wave is gradual; it is felt for an appreciable and relatively long period under the fingers, and it subsides slowly.

While there is no apparent vehemence of the beat, when the strength of the pulsations comes to be tested by an attempt to arrest the wave it is found to have an unexpected degree of force, and very often the greater the pressure of the fingers the stronger it seems to become. This is especially the case when the artery is much contracted and the pulse therefore small, the pulse under these condi-

tions often being supposed to be weak from the inconspicuous character of the pulsatile movement.

Virtual Tension. — An important deviation from the form of pulse just described may, however, be met with when the essential cause of high arterial tension obstruction in the peripheral circulation exists. This is usually at a late stage in the history of the case, when the arteries are worn out and dilated by old standing high pressure of the blood within them; when, also, the heart has yielded to the resistance by which it has opposed and dilation of the left ventricle has taken place. The artery then is large and full between the beats, but when moderate pressure is employed it allows itself to be flattened, and the pulse is sudden in onset and as sudden in its ending, the pressure in the vessel is abruptly raised, remains high for a brief period, and then falls abruptly. The ventricle, in fact, cannot go through with its systole in the face of the resistance in front. This may be called the pulse of virtual as distinguished from actual tension; the peripheral condition for the production of tension exists, but the sustained central force required for "actual" tension is wanting.

Causes of High Arterial Tension.— The causes of high arterial tension are many and various, namely:

Increase in the Volume of Blood. — A constant repletion of the entire vascular system is present in the condition called plethora. This, of itself, would give rise to high pressure in the arteries; but in plethora elimination is rarely efficient, and the blood is charged with waste products, which provoke resistance in the capillaries, so that an additional cause of arterial tension is present. Another instance in which an increase in the volume of the blood contributes to the production of high tension is afforded by the early stage of acute desquamative nephritis, where the retained urinary waters at the same time dilutes the blood and augments its volume.

Frequent and Powerful Action of the Heart. — This occurs in excitement and on exertion; but high tension produced in this way is usually fugitive. The increase of pressure may, however, last long enough to do mischief.

Arteriole Contraction.— The most simple example of this is the increased arterial tension which is produced by external cold. But, although a normal process, the increase of intra-arterial pressure is

often the exciting cause of cerebral hemorrhage when predisposition exists in atheroma of the cerebral arteries. Every winter the first spell of cold weather is attended with a number of cases of apoplexy, as is each succeeding one. The cramp which proves fatal to swimmers is almost certainly a general arterial spasm provoked by the chill of immersion, the resistance to the circulation being aided by the pressure of the water, while the heart is usually also weakened by exertion. It is not only after prolonged exertion in swimming that the so-called cramp occurs. I have known one instance in which a vigorous young man plunged into a pool and was seen by his companion to go straight to the bottom and lie there dead. One of the factors in the causation of angina pectoris, or, at any rate, in one form of this affection, appears to be general arteriole spasm. The prominent phenomenon of rigor is general arterial spasm; and in the cold stage of malarial fevers this may be carried to such a degree as to bring the heart to a standstill by the resistance produced. It is from this cause that the cold stage of malignant intermittent or remittent fevers is attended with danger of fatal syncope or serious nervous complications.

Cases are sometimes met with, independently of malarial poisoning, in which general arterial spasm becomes a source of danger, as in some forms of angina pectoris.

In hysteria, arteriole spasm is a highly characteristic feature, especially during a hysterical fit. The copious, limpid, watery urine is, no doubt, an effect of the high arterial tension so induced. Nervous excitement of certain kinds is attended with contraction of the arteries; and this is the explanation of the diuresis of nervousness. In migraine, again, there is general arteriole spasm, and the attack itself has been attributed to contraction of the cerebral arteries. The early stage of meningitis is attended with arterial tension from contraction of the arterial walls.

Resistance in the Capillaries. — This is the most frequent and important of the causes of arterial tension. That certain substances, present in the blood in very minute proportions, give rise to obstruction in the capillaries is clearly demonstrated by Drs. Ringer's and Saintsbury's experiments with digitalin, ergotin, etc., which show also that the effect is independent of reflex nervous influence, since it occurs when all the nerves are divided. The special material

which plays this part is almost certainly nitrogenized waste which has not undergone the complete oxidation necessary for elimination.

The diseases, gout and renal disease, in which high arterial tension is most marked, are exactly those in which there is the greatest certainty of the existence in the blood of the products of imperfect metabolism. High arterial tension produced by arterio-capillary obstruction occurs under the following conditions:

(1) *Age.*—There is a tendency to the development of resistance in the peripheral circulation and of arterial tension with advancing years; it is one of the ways in which the tissues show that they are growing old. This is most marked when high tension exists from other causes.

(2) *Heredity.* — Inherited tendency must in many cases be assumed as the only explanation of undue tension in the arterial system. No condition, indeed, runs more strongly in families than high arterial tension, and it is the explanation of a family liability to apoplexy and paralysis, or to death from heart disease.

(3) *Renal Disease.* — Renal disease of whatever kind, except acute suppurative pyelitis and nephritis, and perhaps tuberculosis and amyloid degeneration, is attended with high arterial tension, due to the imperfect elimination of urinary constituents.

(4) *Gout.* — Gout, again, is so constantly accompanied by high pulse tension that the term "gouty pulse" has passed into currency.

(5) *Diabetes.*—In connection with gout may be mentioned diabetes, one form of which is accompanied by high pulse tension and is closely associated with gout.

(6) *Lead Poisoning.*—Lead-poisoning is another cause of high arterial tension.

(7) *Pregnancy.* — Pregnancy is invariably accompanied by increase of tension in the arteries. Whether this arises from a general augmentation of the volume of the blood or from the presence in the blood of effete matters derived from the fœtus, is perhaps not altogether settled.

(8) *Anæmia.*— It is not easy to understand how anæmia can give rise to high tension in the pulse. One would have expected the watery blood to pass readily through the capillaries and the *vis a tergo* supplied by the heart to be deficient; but it is a matter of daily observation that the artery is full between the beats, and that

the pulse, if more abrupt than in renal disease, is long. The occurrence of dilatation of the left ventricle and mitral regurgitation, which is very common as an effect of anæmia, is at once understood when the resistance in the peripheral circulation is taken into account; it is not merely the innutrition of the walls of the heart, due to anæmia, which causes them to give way, but the increased work thrown upon the left ventricle by this resistance.

(9) *Emphysema.*— In cases of emphysema and chronic bronchitis, and sometimes even in phthisis, the systemic arteries present the signs of increased tension; in emphysema they are specially marked.

The etiology of high arterial tension will require very few words. The remote causes are just those which conduce to the imperfect oxidation and elimination of nitrogenized waste.

(1) *Food.*— A high proportion of animal food, and especially of butchers' meat, stands first on the list. There is no such great difference between fowls of all kinds or game and red meat as is popularly supposed, but perhaps meats contain more extractive matters. Soups, beef-tea, and animal juices, meat extracts, and the like, however valuable, contain a maximum of potential waste in comparison with matters available for tissue nutrition.

(2) *Alcoholic Drinks.*— Any form of alcoholic fluid in excess, spirits, wine, or beer, will interfere with the normal metabolic processes and lead to the retention of impurities within the system.

(3) *Sedentary Habits.*— Inadequate amount of exercise in the open air, especially when a great part of the day is passed in offices lighted by gas and imperfectly ventilated, intensifies greatly the effects of excessive food and alcoholic drink, and will of itself conduce to imperfect oxidation.

(4) *Constipation.*— This is a very important cause of high arterial tension, and it acts in at least two ways. The undue retention of fæcal matters in the large intestine leads to resorption of the fluid parts, and these constitute impurities in the blood likely of themselves to provoke resistance in the capillaries and calculated also to interfere with digestion and with metabolism in the liver and tissues generally, which would add to the impurities. The foul tongue and offensive breath, and sallow complexion attending habitual constipation are sufficiently suggestive. But constipation has a

direct influence on arterial tension, probably through the effect on the abdominal veins. This is patent to every-day observation if the pulse is examined before and after defecation. Many weakly persons are greatly depressed after even an ordinary evacuation, and come to dread it, and syncope is not uncommon after an unusually large motion. It is easily understood, then, how constipation becomes a source of danger and injury. It promotes high arterial tension both directly and indirectly, and a further danger arises from straining at stool, which not infrequently determines the rupture of a cerebral vessel, or breaks down the *modus vivendi* of a weak heart. Constipation is the special danger of old age, and the indirect cause of death to numberless old people. It is not inconsistent with a daily action of the bowels, the relief being incomplete; so that gradual accumulation of fæcal matters takes place, and so-called diarrhœa in old people is very often a symptom of such accumulation. The presence of scybala gives rise to frequent calls to the stool, and all that escapes is a little liquid consisting of secretion from the mucous membrane of the rectum stained by *débris* washed from the surface of the hard masses.

Pathological Effects of High Tension.—The pathological changes resulting from unduly high tension must now be traced in the arterioles, arteries, and heart.

Hypertrophy of Muscular Coat of Arteries and Fibroid Change.

Rupture of Vessels.— The most common and serious effect on arterioles of the smallest size is cerebral hemorrhage from rupture of terminal branches of cerebral arteries.

Atheroma and Degeneration of Small Arteries.— Atheroma of aorta and its consequences. The constant stress on their walls sets up a chronic inflammatory process; degenerative changes follow; the lining membrane of the vessels gives way, and the excluded matter is gradually carried off by the blood. Another secondary effect of aortic atheroma is narrowing of the orifices of the coronary arteries. This, with extension of atheromatous disease into these arteries from the aorta, is the most common cause of fatty degeneration of the heart, which must thus be set down as one of the consequences of high arterial tension.

Diseases of Valves of the Heart.— Valvular disease, properly speaking, is also set up by high arterial tension.

Hypertrophy of Heart Walls.— On the heart walls the first and most constant effect is the production of hypertrophy.

Dilatation of the Heart.— Dilatation is another common result, either preceding hypertrophy, or associated with it from the beginning, or supervening at a later period.

Glaucoma.— The characteristic feature of which is intra-ocular tension, under which the globe of the eye becomes bullet-hard and the optic disc cupped.

"*Cheyne-Stokes' Respiration,*" says Broadbent, "has, in my experience, been so constantly associated with high arterial tension that I feel justified in looking upon it as an effect of this condition of the circulation, not indeed, perhaps, simple and direct, but in the sense that high pressure in the arterial system is, if not a necessary, yet the most constant recognizable factor."

Symptoms Attending High Arterial Tension.—Among the more frequent and important of these symptoms are headache, sleeplessness, breathlessness, depression; loss of energy, resolution, memory, and nerve; giddiness, a sense of fulness in the head, pain and oppression in the chest, and neuralgia. Headache may vary in seat, character, and duration. It may be frontal, occipital, or vertical. It is sometimes a morning headache, which disappears after the bath and breakfast; at others it comes on after mental work or towards the end of the day. Headache is very common in the subject of high arterial tension, but high tension has no specific form of headache. Migraine, or sick headache, again, is, according to my experience, almost always associated with high tension, not only during the attacks, but as an habitual condition, and the liability runs in high tension families.

"Neuralgia, not of migraine character, is one of the less common effects of high tension, and it is only mentioned because we should not under ordinary circumstances think of resorting to the treatment suggested. I have, however, seen neuralgia cured by a dose of calomel when all other remedies, including change of air, had failed to give relief. The patients were pale and weakly ladies, and were not suffering from constipation. Calomel, therefore, appeared to be contra-indicated, and was only at length given because of the high arterial tension which had been noted throughout." Depression of spirits, loss of the power of concentrating the attention, impairment of

the memory, painful irresolution, irritability of temper, and loss of nerve are other symptoms commonly met with in association with high arterial tension. Breathlessness on exertion, as severe as in advanced heart disease, may be simply the result of high tension; the resistance in the peripheral vessels may have an effect on the circulation equivalent to that of valvular disease or dilatation of the heart. I have seen several cases in which the patient has been compelled to stop and sit down or support himself by railings, gasping for breath, two or three times in the course of a few hundred yards of level walking at a slow pace, no cause for this being recognizable in the heart, and complete and permanent relief being afforded when extremely high tension was reduced.

Treatment.—It would not be good practice to prescribe for high tension alone, unless there was such an absence of concomitant symptoms as to warrant it. Such a condition is fortunately rare, but when it does occur we should not hesitate to prescribe for the one symptom. We will then have to decide whether the high tension is due to vaso-motor irritation or atheroma. If the former, aconite, glonoine, mercury, veratrum viride, and gelsemium are the physiological remedies. There are a few of our school who object to the use of the word physiological as applied to the effects of medicines, and insist that the word pathogenetic should be used. I cannot agree with them. The word pathogenetic means disease-causing. I use the word physiological in the sense that a medicine is capable of changing an abnormal process to a normal one by exerting its primary action with the effect of restoring normal physiological action. For example: a patient has a hard incompressible pulse; the artery feels like a cord between the beats. If the artery is at the same time narrowed give aconite 1x, a drop every hour, and in less than twenty-four hours the pulse is normal. Then suspend the medicine and the condition does not return. Other remedies for new symptoms may be needed, but we have perhaps arrested a condition which might have proved serious. If the pulse is full, hard, and forcible, veratrum viride 1x is the remedy. Neither of these remedies require the presence of fever to make them fully indicated in a condition of high arterial tension.

When high tension is caused by some toxic material in the blood

there is no drug equal to mercury to aid in its elimination, when this toxic material is generated in the liver or intestines.

Broadbent gives the following indications for mercury, and I have often verified his experience.

"An attack of apoplexy may be staved off by a timely dose of calomel, and by the same means a laboring heart, unable to cope with the resistance in the arterioles and capillaries, may be at once relieved. The great remedy for mischief of any kind impending as a result of high blood-pressure is a mercurial purge. The effect of mercury employed as an aperient upon abnormal tension in the arteries is a matter of observation. The method by which the effect is produced is a question of hypothesis, but there can be no doubt that it is by elimination, and there need be little hesitation in concluding that the seat of the accelerated metabolism — of which the elimination is a resultant — is the liver. Such, at any rate, is the working hypothesis by which I am guided. It may be added, perhaps, that I entered upon the independent study of medicine fully impressed with the view of teachers held in high respect and confidence, who considered that the action of mercury on the liver had been entirely disproved, and that mercury, indeed, had practically no useful place in medicine, and that it has been from my experience of its effects on blood-pressure that I have come to value it as one of our most important remedies. Full doses of calomel being reserved for emergencies, the less serious symptoms may be met by the administration of a single grain of pil. hydrarg. with ipecac, and rhubarb or colocynth twice or three times a week, with which may be combined from time to time a three-weeks' course of mild salines. To intermediate degrees of urgency may be adapted suitable doses and combinations."

The rhubarb and colocynth can be left out. I like the combination of mercurius dulcis and ipecac — one-tenth of a grain of each in a tablet; dose, one to five. One every hour will often act as an active laxative in a few hours.

If high tension is persistent and there is reason to believe that degeneration of the arterial coats has commenced, the patient should be put upon the use of iodide of potassium or the iodide of sodium in material doses—one to five grains three times daily. This should

be continued for weeks, or until the condition is ameliorated. In cases where rheumatism is present, iodide of lithium is superior.

Phytolacca is an excellent medicine in high arterial tension. It resembles very closely iodide of potassium, and will often relieve when the iodides have failed.

Glonoine is indicated in cases of acute, sudden, and intense vaso-motor spasm such as occurs in plethoric, apoplectic, and neurotic persons, and chronic cases due to atheroma, or persistent contraction of the arteries. As a rule a drop of the 1c. (one per cent solution) is sufficiently strong in acute cases, but we should not hesitate to increase the dose until the arteries relax. Cases are on record where the dose had to be increased until one-tenth and even one-fourth of a grain had been given before relief was obtained, and these doses were given every four to six hours without unpleasant symptoms, but with decided benefit, and continued for weeks. The reader may ask, why do you not recommend the medicines whose primary action is to cause high arterial tension? I answer that I have tried them in high and medium attenuations, and they have disappointed me. I have given digitalis, ergot, hydrastis, cactus, nux vomica, and others which primarily contract the arteries and increase the blood-pressure; and I have prescribed them in the 6th, 12th, and 30th, but I have never seen them modify this condition. I make no attempt to explain this apparent failure of the law of *similia*.

In anæmia with high tension, glonoine has been combined with some preparation of iron with excellent results, when iron alone failed to produce benefit. Ferro-cyanuret of potassium will give the same results, for the hydrocyanic acid is a relaxant of arterial tension.

Constipation is a common cause of high tension due to the generation in retained fæcal matter of poisonous ptomaines and leucomaines. In such cases mechanical means like the colon-douche or active purgatives are imperatively demanded. The physician who allows fæcal poisons to accumulate in the system is guilty of malpractice, as much as if he allowed a foreign substance to remain in a wound, or septic material to remain in the uterus. The high tension of Bright's disease should be treated with glonoine, muriate of gold, sweet spirits of niter, hot sitz baths, vapor baths, diuretin, and other medicines which relax the tension of the renal arteries and

allow the urinary poisons to be carried off. If this is not promptly done uræmia will result. Hysteria and some forms of neuralgia are perhaps due to high tension. At any rate I have observed that when the pulse is rendered full and soft by gelsemium, lobelia, asafœtida, castoreum, and moschus, the hysterical manifestation subsided. As Dunham pointed out, platina is the true similimum of hysteria with spasm of the arterioles. In some cases it will cure, but its failures are many.

Camphor will primarily cause high arterial and capillary tension with apparent collapse and convulsions, and secondarily the opposite condition of low tension with fainting and cramps. This was observed by Hahnemann who considered them "alternating" symptoms. Nux-moschata has similar effects. If ferrum phos. is indicated by the symptoms (and not according to Shuessler's baseless theory) it will prove in minute doses an excellent remedy in the high tension of plethora, but its action should be aided (in plethora) by a light non-nitrogenous diet, copious libations of pure soft water, the use of saline laxatives and a good deal of active exercise or labor. With this regimen, and the administration of phytolacca, veratrum viride, and iodide of sodium, I have seen dangerous plethora with impending apoplexy improve rapidly in a few weeks.

Angina pectoris, and what is called angio-spastic neuralgia and headache, is but a manifestation of intense arterial tension combined with spasm. They may have their origin in irritation of the medulla, or be caused by morbific substances in the blood. These painful affections require promptly acting remedies, and it has been found that moist heat (not over 100° F.) applied locally is one of the best means of relief. If too hot, the heat will aggravate the spasm. In acute cases amyl or ether will give immediate relief, and glonoine 1c, belladonna 1x, veratrum album 3x, spigelia 3x, phenacetin 1x, caffeine 1x, and antipyrine 1x, will often relieve quickly.

LOW ARTERIAL TENSION.

This is not a disease but the consequence of many abnormal states. Dr. Broadbent, in discussing this condition of the pulse, says:

"Whether the freedom of flow through the peripheral vessels is determined entirely by changes in the size of the arterioles, or is

influenced primarily by the degree of obstruction in the capillaries, it must be admitted at once that the muscular walls of the minute arteries respond more promptly and energetically to nervous stimuli than the capilaries; and in emotional and reflex influences upon the peripheral circulation there can be little doubt that spasm or relaxation of the arterioles is the mechanism employed. When, for example, there is from nervousness sudden and fugitive high arterial tension, it is in part due to tightening up of the minute arteries, and not solely to the hurried and forcible action of the heart; and in blushing, it is relaxation of the arterioles of the affected region which allows the skin of the face and neck to be flooded with blood. Such relaxation may be partial, as is frequently seen on exposing the chest in young women for the purpose of stethoscopic examination, when it is found to be covered with large bright-red blotches. But while the arterioles are competent to influence the supply of blood to different parts and organs of the body, and undoubtedly play an important part in regulating this, in doing which they will produce corresponding effects on the arterial tension by opposing or facilitating the flow in the capillaries, it is probable that the capillaries themselves are the seat of the principal obstruction to the onward movement of the blood, and of those variations in the degree of obstruction which are most influential in modifying the blood-pressure. It is indeed certain that it is in the capillary network that the normal physiological resistance in the peripheral circulation takes place, and it is only here that the resulting pressure could have the effect which it subserves, of promoting the transudation through the capillary walls of nutrient material for the use of the tissues. Up to the very edge of this network the blood-pressure in the arteries and arterioles is maintained; beyond it there is only just sufficient to carry the blood back to the heart in the veins. We might reasonably expect, then, that where the resistance which gives rise to the pressure in the arterial system is originally situated, there would arise those differences in the degree of resistance which affect arterial tension. Evidences in favor of this view are not wanting.

The relaxation and contraction of the arterioles are reflex, or, at any rate, take place in response to stimulation of their muscular walls by the vaso-motor sympathetic nerves; but experiments with a variety of drugs have shown that variations in the rate of flow through

the capillaries and in the arterial tension can be induced when the spinal cord and sympathetic ganglia and nerves are destroyed, *i. e.*, when the vaso-motor nervous apparatus is abolished. Drs. Ringer and Saintsbury have described such experiments made with the digitalis group of remedies ("Med. Chir. Trans.," lxvii.), and corresponding results have been obtained with amyl nitrite and other relaxants of the peripheral vessels by Dr. Lauder Brunton.

"Although it appears from the preceding considerations that the starting point of the physiological resistance in the peripheral circulation and of the variations in this resistance is the capillary network, the arterioles are not without an important share in the process. The contraction of the capillaries is continued backwards along the arterioles to arteries of the size of the radial, and the narrowing of the afferent channels thus produced at the same time contributes to the production of the arterial tension, and protects the capillaries from the afflux and pressure of blood; in like manner when the capillaries are relaxed, the arterioles and arteries are large. The arteries and capillaries, in fact, form part of one system, and the expression 'arterio-capillary resistance' is more exact than when an obstruction is qualified as either arterial or capillary alone. The capacity of the arterial system, as has already been stated, increases with the subdivision of the arteries, and the capillary channels are collectively much larger than the arterioles which supply them; it is conceivable, then, that the outflow might be so free, in spite of the friction between the blood and the walls of the containing vessels, that it would pass onward into the veins as it was injected by the heart into the aorta. Of course the same amount of blood does pass through the capillary network generally at each pulsation as is propelled by the corresponding ventricular systole, but the systole is effected in one-third of the time occupied by the entire cardiac revolution, so that the blood is three times as long in escaping by the capillaries, and there are accumulated in the arteries, distending them and bringing into play the elasticity of their coats, a considerable number of charges of the ventricle. In proportion as the flow through the capillaries is free, the number of heart-beats stored up in the arteries will be diminished, the mean of continual blood-pressure within them and the degree of tension of their coats will be lowered, and, most important of all, the smaller will be the amount of

nutrient material passing through the capillary wall for the use of the structures. Low arterial tension, which is now to be considered, then, implies a diminished arterial reserve and a lessened supply of nourishment to the tissues.

"*Characters of Low-Tension Pulse.*—The essential characters of the low-tension pulse are, that the artery is so readily effaced by moderate pressure that it cannot be felt at all between the beats. It seems to start into existence with each pulsation, and to disappear as the wave passes.

"*Varieties of Low-Tension Pulse.*— There are many varieties of low-tension pulse, according to the frequency and force of the heart-beats. When the heart is acting forcibly the pulse is large, sudden, and vehement (full and bounding), the size of the dilated artery and the shortness of the wave intensifying the impression of force conveyed to the fingers. The force and frequency of the systolic discharge of blood into the aorta may be such as to maintain a degree of fulness of the arterial system in spite of the free outflow by the capillaries, and the radial can then be felt between the beats when only moderate pressure is employed. It can, however, be flattened without difficulty. Dicrotism is, of course, distinct.

"When the heart acts feebly, or sends out a diminished amount of blood at each systole, the diminished amount of blood in the arterial system allows the arteries to contract, and the pulse will be small and very easily suppressed.

"*Causes of Low-Tension.*— As with the time of the heart so with the tone of the arteries; there are variations on each side of the normal average without apparent effect on the health and vigor, and a low-tension pulse may be congenital, or it may run in a family. It is sometimes important to bear this in mind; absence of a proper degree of tension is one of the signs of fatty degeneration of the heart, and when present after middle age, together with symptoms of cardiac debility, it might lead to an erroneous diagnosis of this disease. A medical man who knew the family pulse to be soft would be in no danger of making this mistake. Obesity is usually associated with low-pulse tension, the arteries also being small and the action of the heart weak. It is not unlikely that the languid movement indicated by these conditions may favor the deposition of fat.

Warmth, especially combined with moisture, relaxes the arterioles and capillaries, and lowers the arterial tension; a hot bath will do this very effectually. Food, particularly when taken warm; hot drinks, sustained exertion, fatigue, and exhaustion, bodily or mental, are other physiological causes of relaxation of the peripheral vessels. As regards the effect of a meal in lowering the pulse tension at the wrist, it might be attributed to the large diversion of blood to the abdominal viscera during digestion, but this will be compensated in some degree by the increased volume of the blood by rapid absorption from the gastro-intestinal mucous surfaces. It is, moreover, evident from the character of the pulse that the arteries are relaxed and large, and not simply unfilled. We see, too, in the flushed face and red nose of certain forms of dyspepsia, especially in women and young girls, a local exaggeration of the general arterial relaxation. Anxiety, worry, and the depressing emotions; inadequate food or deficiency in the nitrogenized constituents of food, occasionally excessive indulgence in alcohol, and various unfavorable hygienic influences, may give rise to low arterial tension. Debility of certain kinds is attended with low blood-pressure, but anæmia, especially when associated with chlorosis, often has a high-tension pulse.

Certain states of the nervous system are associated with low-pulse tension. Sometimes it is the affection of the nervous system which causes the low tension, sometimes it is absence of due intra-arterial pressure, which gives rise to the morbid condition of the nerve centres. This subject will be discussed later. The most common cause of relaxation of the arterioles and capillaries and of low tension in the pulse, however, is pyrexia.

Effects of Low Arterial Tension. — Deficient resistance in the peripheral circulation, and consequent abnormally low pressure, are not likely to affect injuriously the heart or arteries directly, and no morbid change in either has been traced to low-pulse tension. The nutrition of the tissues generally will not, however, be maintained at a high point, and the heart will share in the imperfect renewal of structures, especially as the blood-pressure in the coronary arteries will be low, and the movement of blood in the walls of the heart languid. Moreover, the heart is not called upon to exercise full normal energy; and just as overwork in consequence of high arte-

rial tension gives rise to hypertrophy, underwork will tend to atrophy. It is possible, then, that low-pulse tension may predispose to cardiac degeneration.

Symptoms. — The symptoms associated with a pulse of low tension are extremely varied, and they are, for the most part, not the result of the weak pulse, but concomitant effects of an underlying cause. Many of them are equally common when the pulse tension is high, and the question is not what symptoms arise out of low or high pressure in the arteries, but, given certain symptoms, what is the state of arterial tension, since this is an important guide in the treatment. It has appeared to me that undue relaxation of the small arteries is sometimes a cause of weakness and depression by permitting undue loss of heat. It is the duty, so to speak, of the arterioles to shut off the blood from the surface of the body on exposure to cold, and thus to protect it from being cooled down. When this function is imperfectly performed the skin and the extremities may be warm in spite of very low external temperature, but the body must lose heat rapidly from exposure to cold of successive portions of blood distributed freely to the skin, and either the temperature of the body generally will fall, or increased oxidation and tissue change will be required in order to keep it at normal level. In either case the tax on the system will be heavy, and only a vigorous constitution can support it with impunity. A sufferer from the depression produced in the way just described will often exhibit his warm hands and boast of his warm feet as proofs of his excellent circulation.

Abnormally low pulse tension may be associated with a great variety of functional derangements, as well as of symptoms; dyspepsia, constipation, sleeplessness, headache, and a multiplicity of pains and sensations in the head, or about the heart, or in the back; and when flatulent dyspepsia and constipation are present it is sometimes a defensible hypothesis that the depression and other nervous symptoms may be due to the gastro-hepatic or intestinal derangement, and the rectification of all recognized departures from functional efficiency and regularity would be one of the first objects of treatment. It is worthy of note, however, that when the pulse tension is low the patient often feels better while the bowels are confined, and depressed and faint for some time after any action, either

spontaneous or however induced. Such patients bear purgatives of all kinds badly, especially when mercury in any form enters into their composition. Low arterial tension in diseases usually attended with high tension is prognostic of evil. This is especially the case in kidney disease.

Treatment. — "In speaking of treatment," says Dr. Broadbent, "it is scarcely necessary to say that it is not treatment of low tension as such, but of cases in which low arterial tension is a prominent symptom. The first point to be considered will be whether the imperfect resistance in the arterio-capillary system of vessels is due to the state of the blood and tissues, or to deranged nervous influence. It is not easy to establish such a distinction, for under the influence of mental shock, or grief, or anxiety, anæmia may supervene with extraordinary rapidity; and, on the other hand, deterioration of the blood and tissues may react upon the nervous system. Iron, the mineral acids, arsenic, phosphorus, nux vomica, or strychnine, quinine, bark, are among the medicaments most generally useful; digitalis, again, the special tonic of the heart and arterioles, may be of service."

There is no particular objection to the medicines mentioned if they are given according to their secondary symptoms. Their primary effects, when given in physiological doses, are just the opposite of low arterial tension, but in poisonous doses they cause collapse of pulse from heart failure or tetanic systole. Low arterial tension or weak pulse is generally only a symptom of failing vital force. To prescribe for this symptom alone, except in sudden shock, is not good practice. We should try to ascertain the causes which have led to that condition. If from mental shock, like grief, or disappointment, phosphoric acid and ignatia are potent remedies. I well remember several cases where disappointed affection in young girls caused rapid anæmia with extreme low tension, which continued long after the shock, and I remember how rapidly they recovered under the use of the two potent remedies mentioned.

If the low tension is due to impoverished blood, one of the preparations of iron should be given, but we should remember that iron alone will not cure anæmia. The patient must have the revivifying influence of open air, change of climate, and properly selected

food. Cinchona, helonias, aletris, hydrastia, nux vomica, ignatia, and arsenic are great aids to the action of iron, and in some cases will cure anæmia without the use of iron.

We must discriminate between acute and chronic low arterial tension. The former simply requires rest, good food, mild stimulants, and a little medicine. If the result of diarrhœa, or a brief fever, china, veratrum album, ipecac, or iris will be the most useful medicines. When arterial low tension has lasted sometime, the nutritive processes suffer. There will be as a result emaciation, debility, atony of all the muscular structures, and torpidity of the assimilative organs. Medicines which arouse the nutritive functions must be given. Generally the drugs which cause primary low tension are not indicated, but such medicines as arsenic, phosphorus, phosphoric acid, sulphur, nitric and muriatic acid. Nux vomica, strychnia, helonias, sepia, graphites, calcarea phos., picric acid, hydrastis, and cinchona are appropriate. All the above, except sepia, graphites, calcarea, and picric acid (which act best at the 6th trit.) should be given in the lower attenuations. If the emaciation is extreme, cod-liver oil is of great service. If this is repulsive, give morrhual, which contains all the inorganic constituents of the oil, and will restore the assimilative functions in a surprising manner. Stearn's wine of cod-liver oil is a more pleasant preparation than the sugar-coated pills of morrhual, and will be readily taken by children. An excellent tonic to the nutritive functions is a syrup of hypophosphites with saw palmetto.

When the heart remains weak and does not fill the arterioles, notwithstanding the medicines above named, special cardiac tonics should be associated with them. A few drops of the tincture of digitalis, cactus, strophanthus, oleander, coronilla, or kola, given three times a day, will greatly aid the restorative action of food and medicines. Whatever treatment we adopt, it should be faithfully continued for weeks or even months.

The question of rest, or work, is of great importance. Often the surest way to bring about recovery is the adoption of the Weir Mitchel treatment of absolute rest and feeding. In other cases a life of physical activity in the pure open air is the *sine qua non*.

The food will, of course, be simple, nourishing, and digestible. Alcohol will be given with caution at meal-times only, and in the

form of red wine or beer. Change is often of the greatest service, the most powerful climatic influence being sea or mountain air, one or the other being selected, according to the previous experience of the patient.

While absence of resistance in the peripheral vessels is the normal cause of low tension in the arteries, it is obvious that, since the blood-pressure is ultimately due to and dependent upon the ventricular systole, the tension must be low when the propulsion of blood into the arterial system is feeble or deficient in amount. In the latter case, however, the arteries contract upon their contents, still remaining full between the beats, and the pulse becomes small without necessarily being short. Usually, relaxed arteries and capillaries and weak action of the heart go together, or the circulation would come to a standstill.

Bathing is an important agent in low arterial tension, especially when the capillary system is at fault. Prolonged warm or hot baths are injurious, but cold or hot sponging when rapidly done is beneficial; so also is the momentary rain or shower bath.

Charcot, of Paris, uses the cold douche thrown from a small nozzle with considerable force, but only for a minute.

After the baths brisk friction should be used until the skin is aglow.

THE PULSE.

No work on the diseases of the heart and blood-vessels can be said to be complete unless it has as an introduction a chapter on the Pulse.

No correct idea of the significance of the pulse and its relation to the condition of the heart was possible until the discovery of the circulation of the blood by Harvey in 1628. In Dr. Ozanam's work "On the Circulation and the Pulse" he gives the best historical account of the history of the pulse.

The earliest idea of the pulse was that the arteries were filled, not with blood, but with a vital air or spirit. It was supposed that the veins carried the blood to every part of the body and that they had their origin in the liver. It was a great discovery when Galen proved that the heart and arteries contained blood. But he still

believed that the liver was the manufactory of the blood, and that the heart drew the blood to itself from both veins and arteries.

The first treatise on the pulse was written by Herophilus 344 years before the time of Christ. Since that time there have been many, and some of them very voluminous, but his observations are very instructive even at this day. The recent writers on the pulse and the most thorough investigators are Volkman, Ludwig, Chaveau, Marey, the brothers Weber, Henle, Stilling, Claude Bernard, and Brown-Sequard. The latest and most practical of all the treatises on this subject is that of Dr. W. H. Broadbent, of London, which should be in the hands of every practitioner of medicine. It is invaluable as a means of diagnosis and prognosis.

In the following chapter on the Pulse I shall quote extensively from his work,* for quotations give clearer information than any synopsis I could make.

WHAT THE PULSE REALLY IS.

"Now it is not," writes Dr. Broadbent, "as is commonly understood, an expansion of the artery. This at any rate is not what we feel or what is recorded by the sphygmograph. A moment's reflection as to the volume of blood discharged by the left ventricle into the aorta, and a comparison of this with the capacity of the entire arterial system, will convince us that it is altogether inadequate to produce any such expansion of the smaller arteries as will be appreciable to the touch. The aorta and its primary branches are, it is true, dilated somewhat by the injected blood; but even in a vessel of the size of the carotid it is difficult to measure the increase of diameter, so minute is it; whereas in the radial, in which it must be much less, the sphygmograph, if its trace were taken to indicate actual enlargement of the artery, would show the expansion to be considerable. Nor is the pulse a sinuous movement of the artery in its bed from elongation which throws it into curves. To feel the pulsation in an artery, or to take a sphygmographic trace, a certain degree of pressure must be applied to the vessel, and, as is well known, there must be a bone behind it against which it can be compressed.

*The Pulse. By W. H. Broadbent, M.D. Pp. 306. Philadelphia: Lea Brothers & Co., 1892.

What happens then is as follows: in the intervals between the pulsations, when the resistance by the contained blood is at its lowest, the tube of the artery is more or less flattened by the pressure of the finger upon it; then comes the so-called wave of blood propelled by the systole of the left ventricle, or, to speak more accurately, the fluid pressure in the vessel is increased, and this forces the artery back into the circular form. It is this change of shape from the flattened condition impressed upon the vessel by the finger, or by the sphygmographic lever, to the round cylindrical shape which it assumes under the distending force of the blood within it which constitutes for us the pulse. Such a pulsation can be felt on a large scale by placing the foot on the inelastic leather hose of a fire engine in action, in which there can be no expansion, or shown in a scheme of the circulation with inelastic vessels. It is not, then, an increase in the diameter of the vessel, but an increase of the blood-pressure within it, created by the systole of the ventricle of the heart, which constitutes the pulse. Another common misconception must be cleared up, namely, that the pulse necessarily signifies onward movement of the blood in the artery. Since a certain amount of blood is normally injected into the aorta at each systole, it would seem, at first sight, that there must be a corresponding propulsion of blood along the vessel which is under the finger, and misapprehension has been carried so far that the pulse-wave has been understood to mean the actual transport of the blood, and even to indicate the rapidity of such motion. Short of this, it is more commonly taken for granted that the rate of movement of the blood in the vessels is directly proportionate to the strength of the pulse — that a good strong pulse implies a vigorous rush through the capillaries, and a weak pulse a languid flow. The stream which issues from a divided artery is compressed close to the hand, the pulsation above is not extinguished, but exaggerated; and when an artery is tied, the pulsation up to the ligatured point is more vehement than before. Pulsation is thus no evidence of onward movement of the blood. Now, resistance in the arteries and capillaries will have, *pro tanto*, the effect of a ligature, hindering or even arresting the onward current. And there can be no doubt that peripheral obstruction does at times reach a point which almost stops the flow from the arteries to the veins, the pulse appearing to be all the stronger on this account. The heart

acts with increasing energy in order to combat the obstruction, but may fail so far to overcome it as to propel an average amount of blood into the aorta, although it raises the pressure throughout the arterial system. This is a consideration which, it seems to me, is not adequately borne in mind. I think it enters into the explanation of dropsy, and especially of the varying amount of dropsical effusion under apparently similar conditions, and that it also helps to clear up obscurities in the relation between circulatory conditions and head symptoms.

The pulse, then, indicates simply the degree and duration of increased pressure in the arterial system caused by the ventricular systole. There is a certain mean blood-pressure maintained by the elasticity of the large arteries, varying greatly in different individuals, which keeps up the flow through the capillaries, and the level of which is determined by the resistance in the capillaries and the amount of force received from the heart and stored up by the elastic walls of the large arteries. This pressure is lowered during the diastole of the heart by the outflow through the capillaries into the veins, and is reinforced by the successive contractions of the left ventricle, and the pulse marks and indicates the minimum and maximum pressures, with the gradation from one to the other. The term "tension," as applied to the pulse, means simply the degree of fluid pressure within the artery, putting its walls on the stretch.

Arterial tension and blood-pressure mean exactly the same thing. Distension might perhaps be more expressive than tension, if less exact and technical. There are three factors in the production of the pulse, and the influence of each on the variations observed in it must be understood. The three factors are:

(1) The action of the heart.
(2) The elasticity of the great vessels.
(3) The resistance in the arterioles and capillaries.

The heart determines unconditionally the frequency and regularity or irregularity of the pulse, and, with certain qualifications, its force or strength. The great vessels, acting as an elastic reservoir, convert the intermittent jet issuing from the ventricle into a more or less continuous stream, impressing at the same time certain characters upon the pulse according as the elasticity of their walls is perfect or impaired, and according as they are kept fully distended or

only slightly on the stretch. The capillaries and arterioles, by the varying resistance which they offer to the passage of blood through them, determine the mean pressure maintained in the arterial system and the character of the pulse, and influence materially the action of the heart. Each of these must be considered in some detail."

Dr. Broadbent then goes on to explain the relations and influence of the heart on the various conditions of the pulse, as follows:

THE ACTION OF THE HEART.

"*Frequency.*—The heart determines absolutely the frequency of the pulse; and this is true in so far that the number of heart-beats, except when a certain proportion of the latter are too weak to reach the wrist, or when very little blood enters the ventricle during its diastole.

"*Rhythm.*—The rhythm, as well as the rate, of the pulse is determined by the heart, and the pulse, generally speaking, is regular or irregular according as the action of the heart is regular or irregular. The pulse, however, may be made irregular when the heart is acting regularly by beats failing to reach the wrist, and irregularity of the heart's action may be greatly exaggerated in the pulse.

"*Force.*—With regard to the strength or force of the pulse, again, this must be directly dependent upon the strength of the ventricular systole. The pulse cannot be strong or forcible when the heart's action is weak, and it will not, as a rule, be weak when the heart's action is vigorous. But the volume of blood discharged by the ventricle into the aorta is another element in the production of the pulse. If from any cause the ventricle is not properly filled, as may be the case when the total volume of the blood has been reduced by hemorrhages or other cause, or when there is obstruction in the pulmonary circulation, from disease of the lungs or extreme constriction of the mitral orifice, or when the ventricle has not time to dilate, as may happen in palpitation, the systole, however forcible, will have little effect in increasing the pressure in the arterial system; and there may, under such circumstances, be powerful action of the heart with a feeble pulse. It will also be seen, when the influences of peripheral resistance is discussed, that the apparent strength of the pulse may not correspond with the energy of the ventricular contraction,

even when the amount of blood propelled is normal; and the blood-pressure or arterial tension, *i. e.*, the degree of distension of the arteries while it is maintained by the heart, and is dependent upon the degree of pressure supplied by the ventricular systole, is by no means necessarily proportionate to its vigor."

Of the functions of the great arteries Dr. Broadbent says: "The principal effect of the large arteries is to act as an elastic reservoir, which converts the intermittent jet of blood which issues from the ventricle into a continuous stream. They are kept by the resistance to the outflow through the capillaries in a state of continual distension, which is increased momentarily by each ventricular systole, and runs down to some extent in the intervals, but never during life to a point at which the elastic coats of the vessel cease to exercise some compression on its contained blood. The force of the heart is thus stored up and delivered out gradually in the form of a steady pressure, which keeps up an almost uniform flow through the vessels of the periphery. The regular current of blood sustained in this way is essential to the functional activity of the central nervous system.

The Sphygmograph.—"In recent teachings with regard to the circulation and the pulse, the constant reference to the sphygmograph has been an obstacle to the application of the newly-obtained knowledge to clinical work, and especially to everyday practice.

"The sphygmograph has been invaluable in research; it has given precision to our ideas, and in the hands of Marey and others has made clear and comprehensible many intricate and doubtful problems of the circulation. It is capable, too, of rendering important aid in clinical investigation, especially where demonstration and records of changes in the circulation are required.

"It is not, therefore, from ignorance of or want of familiarity with the sphygmograph that I have come to the conclusion that it is not specially useful in practice, that in any form known to me it is not a clinical instrument for everyday work. It is rarely necessary for diagnosis, and scarcely ever to be trusted in prognosis. The indications obtained from it are not, like those of the thermometer, independent of the observer."

The above remarks by Dr. Broadbent confirm my opinion as to the practical value of the sphygmograph. He is well qualified to express an opinion on its merits, for no man has had larger oppor-

tunities of testing its usefulness. He shared the enthusiasm of Anstie, Sanderson, and Sibson, when the instrument first appeared. He admits its value in physiological investigations, and some pathological changes, but such is the amount of skill and precision necessary to its use, that few can perfect themselves in it.

MODE OF FEELING THE PULSE.

"In examining the pulse," says Dr. Broadbent, "our object is to obtain the most complete and exact knowledge attainable as to the circulation and to interpret accurately the facts we observe; the method to be followed must therefore be carefully described. Three fingers should be placed on the artery, and it will not be amiss to observe the old-fashioned rule of letting the index always be nearest the heart; the different points with regard to the pulse should then be ascertained, each by a distinct and separate act of attention. The point first to be noted is the frequency, the number of beats per minute, the regularity or irregularity of the beats as to time, and their equality or inequality in force. This is simple and easy.

"We should naturally wish, in the next place, to estimate the force or strength of the pulse, but considerations which modify the idea derived from the impression made on the fingers may first be conveniently discussed. It will be well, therefore, after counting the pulse to give attention to the size of the artery. This varies greatly in different individuals, and may differ in the two wrists of the same person. It varies, again, greatly according as the muscular coat is relaxed or contracted. We have, then, as a preliminary to any further inference, to distinguish between congenital differences in the diameter of the vessels and variations induced by physiological or pathological influences. Now, a large artery will communicate a more perceptible impression to the fingers placed lightly upon it than a small one, and the beat will seem more forcible. On the other hand, the pulse-wave in a large artery can usually be arrested more readily by pressure, and the pulse is more compressible; one mode of examination thus controls or corrects the other. When the artery is small, and especially when it is rendered small by contraction of its muscular coat, there appears to be little pulsation in it, and the pulse may easily be set down as weak, but let an attempt

be made to obliterate it by compression, and it often seems as if the pulse grew stronger as the pressure on the vessel increased. An important point to be investigated is the degree of constant pressure prevailing in the arteries. The constant intra-arterial pressure or pulse tension is manifested by the degree of fulness of the artery between the beats. To determine this, the artery must first be rolled transversely under the three fingers, or the attempt must be made to do so. In a pulse of average tension the vessel only stands out, so as to be felt distinctly, during the actual beat, and subsides gradually or rapidly in the interval; it cannot, therefore, be rolled by the fingers at all periods, though it may generally be distinguished with care between the beats, especially when the skin is thin and flexible. In a pulse of low tension the vessel can scarcely be said to be felt as such at all; it starts up with the beat, and is at once lost again when the brief wave has passed. In a pulse of high tension, on the other hand, the artery stands out among the structures of the wrist like another tendon, and can be rolled like a cord under the fingers, and followed for some distance up the forearm. While the vessel is thus being rolled about, the pulsation in it may scarcely make itself felt, and the artery can often be seen distinctly, if the skin is thin, projecting on the surface, without any appearance of pulsation, except where it is thrown into curves. Pressure, however, brings out the pulsation and develops its force.

The character of the beat is another matter for study; and brief as is the period occupied by it, each pulse-wave presents a rise, duration, and fall. It may strike the finger suddenly or lift it deliberately; the distension of the artery may be momentary only, or it may persist for a time; the fall of pressure finally may be abrupt or gradual. For the most part, a sudden rise, brief duration, and abrupt fall go together, and constitute the short pulse of large arteries and low tension; while a gradual rise, persistent fullness, and slow decline are usually associated, and give the long pulse of contracted arteries and high tension. Exceptions, however, occur, and they are often of great significance. There may be a large vessel and sudden pulse, when the tension is relatively high, in cases of dilatation of the left ventricle; and a small artery, slowly and feebly filled, in extreme low tension with cardiac weakness. We are now prepared to estimate the strength of the pulse. Three fingers are placed on the vessel, as is supposed to be the case from first to last. With that

nearest to the heart, pressure is made till the wave is arrested, so as not to be felt by the other fingers, or, if necessary, two fingers are employed to distinguish the pulsation. In this way, by the degree of pressure required, and by varying the pressure with one, two, or all three fingers, an idea is obtained of the force with which the heart is propelling the blood onwards.

I have spoken of the manœuvre of rolling the vessel transversely under the fingers as a means of estimating the pressure and tension by which it is maintained in the cylindrical form. Another manœuvre, by which the state of the coats of the artery is ascertained, is to carry the skin along it longitudinally, with varying pressure; curves in its course and bulging in its walls are thus detected, and when the compression is carried so far as to exclude the blood, any inequalities of thickness and density in the coats which may exist are felt, sometimes mere thickening and hardening, at others actual patches of rigidity and calcareous deposit; or the entire vessel may be found to have a thick, leathery, inelastic feel, or may be converted into an irregular, hard, calcareous tube, or may feel like a string of beads under the finger.

"Here a word must be said as to the terminology to be employed in speaking of the pulse; the words quick and slow are capable of two applications: either to the rate at which the beats follow each other, or to the character of the individual beats. This ambiguity may be avoided by the use of frequent and infrequent to indicate the number of beats, and of long and short to describe the individual pulsations, as was the practice with old writers on the pulse. A pulsation is long when the increased pressure due to the cardiac systole can be felt by the fingers to last for an appreciable time; it is short when the pressure is quickly gone. The words strong and weak are even more vague when applied to the pulse than the words quick and slow; they are apt to be used at one time in reference to the mean pressure in the artery, at another in reference to the pulse-wave, the significance being totally different in the two cases. The terms compressible and incompressible are scarcely more definite unless it is stated whether they apply to the artery between the beats or to the pulsations themselves. We must have terms which are incapable of this indiscriminate application. We might speak of the pulse being hard or firm without much risk of this being understood to apply otherwise than to the general feel of the artery, and

therefore to the state of fulness and degree of resistance to pressure in the intervals between the beats. It would scarcely, however, be accurate to say that the pulse was firm, although this would be justified by the example of the ancients, who were very exact in their employment of terms, and it is well to avoid as far as possible all latitude of expression. If it is well understood that by tension we mean pressure, and that this is estimated by the fulness of the artery and the degree of resistance to pressure between the beats, there can be no better term for conveying an idea of this mean pressure than high, moderate, or low tension. We may then describe the beat as vehement or sluggish, or as forcible or weak, always bearing in mind that the wave may be abrupt or gradual. The standard or typical pulse of the adult male may now be described. It will have a frequency of seventy-two beats per minute, will be perfectly regular in time, and the beats will be of equal force. The artery will be of medium size; with care it can be distinguished among the surrounding structures between the beats, but it yields to pressure, does not give the idea of a cord, and cannot be rolled as such under the fingers; it is flattened by moderate force, and does not then feel thick or hard. The individual pulse-waves reach the finger nearest the heart with a definite stroke, which can scarcely be described as sudden, still less as sharp; they have sufficient vehemence to be felt by all three fingers, unless decided pressure is made on the vessel, but they can be arrested without difficulty by one finger, the beat then feeling both more sudden and more vehement. The wave, or expansion, or distension of the artery does not instantly drop, but subsides gently and without perceptible dicrotism.

"The following is a tabular view of the variations from the normal pulse referred to the heart and arteries respectively:

Heart.	Frequency.	Pulse.	Frequent.
			Infrequent.
	Rhythm.		Irregular.
			Intermittent.
	Force.		Excessive.
			Defective.
Arteries.	Relaxed.		Large.
			Short.
			Low-tension.
	Contracted.		Small.
			Long.
			High-tension.

"This classification of the deviations from the normal pulse will serve as a guide in their consideration, but it would be impossible, even if it were convenient, to discuss quite separately and independently the variations due to the heart and those due to the vessels. The heart and arteries are, after all, only parts of the same system correlated throughout by mutual interdependence and by the vasomotor nerves, and abnormal frequency of the heart's action is usually associated with relaxation of the peripheral vessels, and contracted arteries with deliberate heart-beats. Some of the more common combinations may, indeed, with advantage, be enumerated. Frequency and force of the heart's action, with dilated arteries, give the pulse of sthenic fever, and of violent but not excessive muscular exertion, which is frequent, sudden, vehement, large, short, and dicrotus.

Frequency and force, with arteries moderately contracted, give the pulse of excitement, of an early stage of effort, and of the pyrexia attending some forms of inflammation, with extreme contraction of the arteries, the pulse of peritonitis, and of severe rigor. Frequency, with deficient force on the part of the heart and relaxed arteries, gives the pulse of asthenic fever and of exhaustion, which, while frequent and sudden and short, has no vehemence; the dicrotic wave is sometimes so marked that it is almost as distinct as the primary wave. The artery is large, except when the cardiac weakness is extreme.

A normal and slightly slowed heart-rate, with diminished force and relaxed arteries, gives the pulse of fatigue and of convalescence from acute disease, both force of heart and arterial tone increasing as convalescence advances. Normal or slightly diminished frequency and increased force of the cardiac systole, with contraction of the arterioles, constitutes the so-called renal pulse, of which much will be said hereafter, but it is common to kidney disease and to a variety of other conditions with which high tension of the pulse is associated."

The pulse of infants presents an interesting study. Dr. Edwards, in the "Medical and Surgical Reporter," says that "the most marked characteristic of the infant's pulse is irregularity, which occurs whether the child is asleep or awake, at rest or in active movement. Conditions which will hardly perceptibly affect the pulse of the adult will derange the rhythm of the infant's pulse to a marked

degree; disorders of digestion, so common in infancy, show marked effect upon the pulse rhythm. Irregularity is also seen during constipation, or diarrhœa, and is associated with intestinal worms and with dentition. An important, and as yet unrecorded, difference between the infant's pulse and that of the adult is the fact that in the former there is an entire absence of dicrotism, and it does not appear until the child has reached the tenth to the fourteenth year; the infant's pulse has not the same recoil as the adult's; it has furthermore been demonstrated that blood-pressure in the young is very low, and that dicrotism in the adult pulse is produced by conditions that do not exist in the infant. It is also well known, since Marey demonstrated the fact, that the longer the vessel the greater the dicrotism. Infants present great variability in the size of their arteries. On the other hand, the arterial system may be unduly small. The character of the pulse in infants is difficult to describe; it yields readily to the finger of the observer, is small, irregular, and does not present any marked difference between systole and diastole. One observer aptly remarks that the pulse of the infant is deprived of sense, rules, or proportion. It is affected by the most trivial departures from health. Even a slight accumulation of flatus, for instance, will so alter the pulse that judging from it alone, one could not avoid concluding that the little patient was the subject of a grave disease. While irregularity in rhythm may be considered one of the normal features of the pulse, it is not so, however, with persistent frequency, which is always a manifestation of cardiac overstrain, no matter how young the child may be; it also occurs in association with anæmia, leukæmia, and malarial intoxication in babes. The frequent action may be constant or paroxysmal in its appearance. Occasionally in infants we meet with exactly the opposite condition, namely, infrequent pulse, which is usually congenital, although the author has several times observed an infrequent pulse associated with the jaundice that is common during the early months of life, and also with renal disorders. The congenital cases are liable to present also evidences of cerebral disturbances, great mental excitement, or epileptiform attacks."

It is said by the best authorities that the pulse of infants at birth varies from 130 to 150 per minute, and decreases in rate with every year of life. At five years it may be normal at 120; at ten years,

100; at fifteen, 75 to 85. A female infant's pulse is a few beats more per minute than the male.

My experience is that an intermittent pulse in infants who have no heart disease almost invariably points toward some form of cerebral disease, either basilar meningitis, or tubercular meningitis.

THE IRREGULAR PULSE.

Arythmia, when applied to irregular pulse, means that the pulse-beats follow each other at irregular intervals and are unequal in force. An irregular pulse varies greatly in degree, and it is probable that each variety may have a different significance. When the irregularity is extreme there is a rapid succession of small, weak beats, followed by a few large and distinct; or, there may be no method whatever in the irregularity, no two beats being alike either in time or force. Irregularity of the pulse may be either habitual or occasional. When occasional it may be induced by reflex disturbance of the cardiac rhythm, gastric irritation, flatulence, and other functional disturbance of the abdominal viscera. In flatulence, dyspepsia, hysteria, or typhoid fever, if there is distension of the abdomen, irregularity of the heart's action is common. Tobacco oftener causes irregularity than intermittence. So, also, with tea and coffee. A kind of quivering palpitation is usually caused by tea and tobacco. Green tea, and the best tobacco strong in nicotine, oftener causes irregularity than black tea or mild cigars. It should be remembered that irregularity of the pulse may be caused by diseases of the respiratory organs. Obstruction of the respiratory passages by bronchitis, emphysema, phthisis, and pneumonia may all induce irregularity. Habitual irregularity of the pulse is a common result of mitral insufficiency and is the characteristic pulse of this form of valvular disease. "It is so frequent in mitral regurgitation, and so rare in other forms of valvular disease, that it can scarcely be put down to any secondary alternations of the cavities or walls of the heart." (Broadbent.)

When extreme and habitual irregularity of the pulse cannot be traced to any other cause, we must attribute it to the nervous system. As in habitual intermittence, the general health, vigor, and endurance

of the persons may be excellent. They may attain old age without showing any other sign of cardiac trouble.

Generally I consider irregularity more important than intermittence. In children whose hearts are sound it may arise from worms in the intestines, but often it is the first and ominous symptom of tubercular meningitis or basilar meningitis.

Allen ("Encyc. Mat. Med.") gives more than one hundred drugs causing irregular pulse. Snader ("Repertory in Hale's Diseases of the Heart") gives fifty, and this is the most trustworthy.

Treatment.—It need not be repeated that the cause of the irregularity must be ascertained before any medicine can be properly selected. If it be due to mitral insufficiency, it means that compensation of the auricular muscles should be favored by the primarily homeopathic remedies, aconite, bryonia, kali cyanuretum, gelsemium, veratrum album, veratrum viride, colchicum, arsenic, etc., or by those secondarily indicated (heart tonics), apocynum cann., digitalis, adonis, strophanthus, cactus, anhalonium, prunus virginiana, sparteine, etc. If worms be the cause, santonine, salol, cina, silica, teucrium, kousso, pumpkin seeds, naphthaline, kameela, granatum, etc., are indicated.

Sexual neuræsthenia is a potent cause of irregular pulse and should be treated by phosphate of strychnine 3x, cactus 1x or mother tincture, sabal 1x or mother tincture. When the arythmia arises from uterine or ovarian irritation, bromide of camphor, bromide of strontium, or any other bromide will usually control it, but in special cases lilium, sepia, scutellaria, palladium, murex, cimicifuga, or viburnum may be indicated.

In purely neurotic cases special medicines in affinity with the nervous system must be selected. I have had the best results from zinc, phosphate of iron, arsenic, aurum, argentum, and the bromides.

I have known an irregular pulse, which had persisted for weeks, disappear under lycopodium, asafœtida, and salol, given for flatulence. A change in the diet to foods which will not cause flatulence is also necessary. I have also known extreme irregularity of the heart's action to cease when the bowels were unloaded by a good thorough laxative. No strictly homeopathic medicine will thoroughly empty the intestines and clear out the ptomaines which poison the blood and nervous system as well as the heart.

THE INTERMITTENT PULSE.

By intermittent pulse is meant the omission of a beat from time to time. The rhythm of the pulse will generally vary with that of the heart, but not always, for a heart may beat regularly while the pulse intermits. The explanation is that when the pulse intermits, it does so because the contraction of the heart during the intermission is not complete enough to send the pulse wave to the radial artery. Dr. Broadbent says this variety of pulse is the least explainable of any, and is not, so far as he is aware, producible by experiments. There are several drugs, however, which cause intermittent pulse. When found in patients it is generally due to some perverted nervous influence. It is very rarely due to any structural disease of the heart. The intermission may happen at regular and definite periods, every six or up to twenty beats, or the number of intervening pulsations may vary. The interval produced by the missing beat is not usually quite equal to two beats, and the succeeding beat feels stronger from the pressure in the arteries having run down. The heart-beat, again, which immediately follows the intermission is usually more powerful than the others. The intermittent pulse may be constitutional, constant, and due to congenital causes. This constant habitual pulse appears to have no significance either in relation to the heart, or to the nervous system, or to the vital power generally. It is common in men who retain vigorous health to a good old age, and Broadbent knew of a case at the age of eighty in whom it had existed for forty years.

It may occur occasionally from some disturbing cause, as flatulence, indigestion, or the abuse of tea, coffee, tobacco. It is common in chronic gout, neuræsthenia, hypochondria, congestion of the liver or jaundice.

It is among the signs of fatty degeneration of the heart. If it is caused by that condition, a brisk walk for a minute or so will aggravate the intermittence; if not, the exercise will regulate the pulse. If the intermittence comes on when sitting or lying, and is removed by exercise, it is probably due to hepatic disorders.

If caused by tea, coffee, or tobacco, it will disappear in a few days after ceasing to use them. If the intermittence is purely neurotic, exercise, excitement, and fever will regulate the pulse. It will

become regular during the administration of ether, and sometimes during chloroform. I have known many cases when the patient was not conscious of the intermittency. It is more likely to be felt when it is symptomatic or functional than when it is habitual. There may be felt a vague sense of discomfort in the cardiac region, or a sudden sinking feeling in the epigastrium during the intermission, or the "bump" of the stronger beat after the intermission may be felt. If we auscultate the heart we may find that during the intermission it does not actually cease to beat, but an imperfect contraction takes place, which is felt as a kind of vibration. In some cases, however, no sound is heard, and the heart evidently stands still. Broadbent says intermittence is worse after meals. My experience is to the contrary, for my patients are worse before meals and eating, and a little wine or liquor regulates the pulse.

Treatment.—If the intermittent pulse is hereditary, or habitual, or has lasted several years, and the general health is good, with normal heart-sound, no treatment is necessary, and the use of medicines in large doses to regulate the heart will be injurious.

When caused by tea, coffee, or tobacco, if a suspension of these stimulants does not arrest it, digitalis and strychnine, or ignatia, in small doses, will bring about regularity. If due to indigestion, treat that condition. An intermittent pulse is an early symptom of basilar or tubercular meningitis, and medicines for that condition and not for the heart should be used.

Allen, in his "Index of Symptoms," gives eighty-eight medicines as causing intermittent pulse. Now it is not to be supposed that all of them could by any possibility cause such a condition. When we consider that the majority of provers did not know the difference between an intermittent and an irregular pulse we see how unreliable this symptom is in our pathogenesis. From the eighty-eight medicines I would select a few as most useful; namely, aconite, apocynum cann., digitalis, ferrum, glonoine, nux vomica, oleander, strychnine, veratrum album, and veratrum viride. To these may be added adonis, strophanthus, convallaria, cactus, spartiene, or coronilla which we know from clinical experience will regulate an intermittent heart. If we find the intermittent pulse is caused by hepatic disorders, then mercurius, euonymin, chelidonium, carduus, agaricus, ammon. mur., podophyllum, iris ver., chionanthus, and lyco-

podium will be useful. If due to meningeal irritation, gelsemium, belladonna, agaricus, hyoscyamus, or strammonium. If there is high arterial tension, use glonoine, veratrum viride, or kali iod. If due to a weak heart from fatty degeneration or dilatation, phosphorus, strychnine, and digitalis are the three chief remedies.

DISEASES OF THE VEINS.

I. — PHLEBITIS.

" *Causation and Morbid Anatomy.*— Inflammation of a vein is generally due either to the formation of a clot within it, in which case the process commences at the inner surface and travels outward, or to the involvement of the vein in inflammatory processes which are going on round about it, in which case its walls are invaded from without inwards. Phlebitis, indeed, is almost always secondary. Exceptions to this rule are furnished by inflammation of the uterine veins after parturition, and by the comparatively rare thickening of the inner coat of veins which correspond to the much more frequent thickening of the inner coat of arteries issuing in atheromatous and calcareous degenerations. The presence of clots may be regarded as an essential accompaniment to all forms of phlebitis, with the exception of the chronic form last adverted to. Inflammation of veins is characterized by thickening of their walls, connected with proliferation of the protoplasmic elements of their several laminæ. The latter process is generally especially active in the outer coat, which not infrequently acquires considerable thickness and blends with the surrounding similarly affected connective tissues ; and scattered abscesses are apt to appear here and there in its course. The inner coat tends to become rough, and even to give rise to granulations. The contained clot, whether it be formed primarily or secondarily, soon fills the channel of the vein and adheres more or less firmly to its communication with a trunk vein, below into the tributary branches. The further changes which such clots undergo will be considered under the head of Thrombosis.

The *symptoms* of venous inflammation are, if the vein be within reach of direct observation, pain and tenderness in its course, with cylindrical thickening and hardening, and sometimes superficial red-

ness. Abscesses in the course of the vessel, communicating or not with its interior, are not infrequent. There is necessarily febrile disturbance. The remote effects of phlebitis are on the whole much more important than the local effects. They embrace, on the one hand, those due to venous obstruction, dilatation of the distal veins, congestion, and anasarca; on the other, those dependent on the discharge of fragments of a thrombus, or of inflammatory or other hurtful matters into the circulating blood." (Bristowe.)

Treatment. — If there is a temperature over 100° F., with hardness and tenderness of the veins — aconite 1x, and glonoine 2c, internally. An efficient and soothing external application is a distilled extract of hamamelis, with tincture of arnica, eight parts of the former to one of the latter. Cloths or lint, kept constantly wet with this mixture, should be applied and renewed as often as they become dry. This treatment seems to favor the absorption of the clots and remove the thickening of the coats of the vessels. Belladonna is sometimes useful when the phlebitis assumes an œdematous erysipelatous character. Apis has also been of value.

THROMBOSIS AND EMBOLISM.

Definition.—"The term thrombosis has been conveniently applied to the coagulation of blood during life in the heart, arteries, or veins, and includes within its meaning nearly all those cases which were formerly regarded as phlebitic. The term embolism has been introduced to designate those cases in which an artery or vein gets plugged by the impaction in it of a clot or solid mass conveyed to it from a distance by the blood-stream. The morbid phenomena and symptoms which thrombocis and embolism induces are referrable partly to local inflammation, but principally to arterial or venous obstruction." (Bristowe.)

THROMBOSIS OF VEINS.

"In the systemic veins the coagulation of blood during life is common enough. When the venous circulation is simply enfeebled, as in the later stages of heart-disease, and towards the close of phthisis, carcinoma, and other chronic wasting affections, venous thrombosis is of frequent occurrence. It then takes place more par-

ticularly in the trunk veins of the lower extremities, and in those of the pelvis or at its brim. So, again, when some impediment exists to the passage of blood along a vein, the distal portion of the vessel, and in a greater or less degree its tributary branches, fill with clot. When veins are involved in inflammation which is taking place round them, this, as has been pointed out, tends soon to pervade the entire thickness of the walls, and then to induce coagulation of the blood within them, and their complete obstruction, and occasionally, indeed, by perforation of a vein or some other process, pus or other inflammatory products find their way into its interior or into the substance of the thrombus. Thrombosis, secondarily to inflammation, is common in erysipelas, diffuse cellular inflammation, carbuncle, and the like; in puerperal pelvic cellulitis; in inflammation involving the cancellous structure of bones, or the walls of the parturient uterus; and in the venous sinuses of the interior of the skull in connection with disease of the internal ear.

"Whenever a thrombus forms or an embolus becomes fixed, inflammation of the implicated vascular walls, if it did not previously exist, speedily ensues; and hence pain and tenderness soon mark the course of the vessel if it be within reach of investigation, and febrile disturbances generally arise. In either case complete obstruction to the passage of blood through the affected vessel takes place very soon if not quite suddenly.

"The results of venous thrombosis are stagnation of blood in the tributary veins with dilatation, soon followed by œdema and compensatory enlargement of the anastomotic veins. These conditions are not secondary to thrombosis only, but attend all cases in which veins from whatever cause are obstructed. The consequences of arterial thrombosis or embolism, on the other hand, are impairment of nutrition of the region which the artery supplies, and, following on this, congestion, hemorrhage, inflammation, degeneration, or gangrene, together with special symptoms due to the organ or part whose integrity is compromised. Similar phenomena necessarily ensue upon all forms of arterial obstruction, no matter how they are produced. The special effects of thrombosis and embolism will, for the most part, be best discussed in connection with the other morbid conditions of the several organs in which they occur. There are two or three cases, however, which may be most conveniently considered

now. They are phlegmasia alba dolens, thrombosis and embolism of the heart and pulmonary artery, obstruction of the larger arteries of the limbs, and multiple embolism of the smaller systemic arteries.

"*Phlegmasia alba dolens.*—This term is generally applied to the painful and œdematous condition of leg which often follows upon parturition. An almost exactly similar condition may, however, occur independently of parturition, and even in males, and is not infrequently developed in the course of phthisis and carcinoma. The arms also may be affected in like manner as the lower extremities. Phlegmasia alba dolens is due to thrombosis of the trunk veins of the limbs, or of the larger veins to which these converge, which becomes converted into painful rigid cords. When it follows parturition it generally begins from a week to a month after that event, and almost always in the left lower limb. And even if the right become affected it is usually affected in company with the left but at a later period. The commencement of this disease is generally sudden, and indicated by the concurrence of diffused pain throughout the affected member, and œdema. The pain varies in character and intensity, and is generally attended with soreness or tenderness, sometimes with distinct hyperæsthesia, sometimes with loss of sensation; and not infrequently the patient is unable, either from pain or from loss of power, to move the limb or any of its parts. The œdema gradually increases until the member gets large and smooth, and of a peculiar pale, waxy aspect; it does not generally pit distinctly on pressure, and often presents a mottled, retiform character, owing to the rupture, as in pregnancy, of the deeper layers of the cutis. There is not, as a rule, any manifest change of temperature in the affected limb; but general febrile disturbance is usually present. If there be no serious complication, the patient probably recovers at the end of three or four weeks. For the most part, however, the veins primarily obstructed remain impervious; and sometimes there is permanence of œdema." (Bristowe.)

Treatment. — One of the most complete articles ever written on the etiology and pathology of phlegmasia alba dolens can be found in Leavitt's "Obstetrics" and was written by Dr. L. L. Danforth and Dr. C. G. Higbee. From the researches of various investigators, there would seem to be three varieties of this disease: (1) a true phlebitis from traumatism, (2) thrombosis in the veins of the leg,

and (3) septic infection. Sometimes two or all of these conditions may be present to complicate the case.

The prophylaxis of this affection consists in strict asepsis and antisepsis during and after labor; and attention to the general health of the patient. As soon as pain, heat, and swelling appear the leg should be closely enveloped in compresses composed of distilled extract of hamamelis one quart and tincture of arnica one ounce. Over the compress place a thick covering of cotton batting. This is all the local treatment necessary. The leg should not be rubbed while it is hard. Wait until it begins to grow soft, then rub gently twice a day with oil of arnica eight ounces, spirits of ammonia half an ounce. In the septic variety half an ounce of oil of turpentine, ichthiol, or lysol can be added to the above mixture. Judging from the excellent effect of ichthiol in other affections of a similar nature ichthiol may be of great value in all varieties of this disease. A ten per cent solution can be applied.

Internally for the fever, aconite, baptisia, or veratrum viride. For the pain, phenacetin, or piscidia in suitable doses. Arnica, hamamelis, apis, and belladonna, will be indicated in many cases.

Constipation should not be allowed, and a good action of the kidneys should be obtained.

2. — VARIX (Dilatation of the Veins.)

Causation. — Dilatation of veins is much more common than that of arteries, but its causes are a good deal more obscure. It occurs, no doubt generally, in obstructive diseases of the right side of the heart, and when a vein is obstructed, throughout the venous system which is tributary to it, as well as in those collateral veins which take on, or divide between them, the duties of defaulting vessel. But in a large number of cases veins get dilated and varicose independently of all obstruction, independently of overwork, and independently also of obvious degeneration or weakening of the walls.

Morbid Anatomy.—When veins dilate they become at the same time elongated and consequently tortuous. The dilatation usually commences, and is always most marked, immediately above the valves; and the affected veins assume, therefore, an irregular moniliform aspect. The walls, for the most part, thicken considerably,

although presenting occasional attenuations, especially over the convexities of the dilated portions. The thickening is principally due to hypertrophy of the middle coat, the attenuation to its atrophy or disappearance. With the progress of dilatation the valves become inefficient, and often shrivel up; calcareous plates not unfrequently form in the middle coat; the connective tissues around gets thickened and indurated, and blended with the outer coat of the veins; phlebolites are often developed into the pouch-like protrusions of ulceration from without or by laceration.

Dilatation may occur either in veins of medium or large size, or in those which are ordinarily mere capillary tubes. The former occurrence is exemplified by the ordinary varicose veins of the lower extremities, and by varicocele, the latter by the tuft-like groups so common in the lower limbs of pregnant women. Dilatation and varicosity of veins rarely require treatment at the hands of the physician. For him they serve mainly as important aids to diagnosis. Varicose veins in the lower extremities, varicocele, and hemorrhoids are surgical disorders. Dilated or varicose veins of internal organs no doubt occur, and aid in the production of functional disturbances; they may even rupture and cause death by hemorrhage. We have witnessed this accident in the case of varicose veins of the œsophagus. But their presence can rarely, if ever, be recognized during life. The importance of the dilatation of certain groups of superficial veins in enabling us to judge of the seat and character of internal diseases involving the obstruction of deep-seated veins is obvious." (Bristowe.)

In direct opposition to the dictum of the above quoted author, Burnett, in his "Diseases of the Veins," says: "Atonic, dilated veins may, in many instances, be made to shrink to their original size by the proper use of medicines administered internally—in other words, varicosis, hemorrhoids, varicocele, and varices are amenable to drug treatment, and therefore, surgery, in this department of diseases of the veins is to be superseded by medicines."

In another place he says: "General varicosis eludes the surgeon entirely, for surgery must necessarily be local." He hits the truth, also, when he says "a *merely* surgical cure is no real cure at all, and in its very nature cannot be radical — better than nothing, no doubt,

and often nearly as good as a cure, still, not a healing in its true sense."

Even E. H. Pratt's method of extirpating the whole "pile-bearing inch," will not cure permanently when the dilated veins are due to causes within the liver or portal system.

Burnett's assertion is borne out by thousands of homeopathic physicians, and also by many eminent practitioners of the old school — such men as Tripier of France, and N. S. Davis of this country. In my experience and studies of our therapeutics the real remedies for diseases of the veins of a primary origin appear to be hamamelis, collinsonia, aurum, arnica, aloe, ferrum, baryta, pulsatilla, carduus, æsculus, hydrastis, nitric and muriatic acid, nux vomica, and sulphur.

When varices are due to disease of the liver, carduus, chelidonium, mercury, euonymin, podophyllin, chionanthus, nitro-muriatic acid, æsculus, and agaricus are indicated. When they are due to a feeble heart — causing venous stasis — cactus, collinsonia, digitalis, strophanthus, convallaria, viscum album, and nux vomica or strychnine will be found most efficient. When varices of the legs and vulva occur in pregnant women, it is due to pressure preventing the return of venous blood. Medicines will do little good unless the abdomen be suspended by an abdominal bandage; then hamamelis, collinsonia, and arnica may be of great value.

Varicocele, when not of too long standing, can be cured by collinsonia. Burnett reports a remarkable case of varicocele, with general varicosis and varicose veins, which greatly improved under the long-continued use of ferrum phos. 6. Incidentally he says "ferrum phos. is most useful in the varicoses of the old; fluoric acid in the young." He reports a case of varicocele which was nearly cured by fluoric acid 6.

I once reported a case of varicose veins of the legs cured by hamamelis. When I began to treat the case I prescribed in doses of a few drops of the tincture three times a day. But little improvement was noticed after several weeks. The patient was a man who had a history of constitutional varicosis inherited from his mother. I was about to abandon hamamelis when I saw in an old school journal a cure of an extreme case, by teaspoonful doses of the fluid extract. Feeling it my duty to test it, I prescribed that dose three

times a day; to my gratification and surprise the condition began to improve in less than a week, and in three weeks hardly an enlarged vein could be seen. Neither during the time the patient was taking these large doses, nor after, did there appear a single pathogenetic symptom; on the contrary his digestion and general health improved all the time. This should teach everyone, as it did myself, that we too often have an unfounded fear of material doses.

I cannot omit to quote in this place the surprising curative effects of carduus, as reported by Dr. A. Tripier of France, and which I have often verified in my own practice. In the "Bulletin General de Therapeutique," he writes of visceral varices:

"Varices of the superficial veins of the limbs or the trunk are easily perceived. In the deeper veins of the members their diagnosis is more obscure, and we know that they exist and give rise to painful œdemas which have thus far been treated by the merely palliative measure of compression. Other localization of varices we recognize as hemorrhoids and varicocele. I was once satisfied with these summary notions of varix. Clinical observation, however, led me to ask if the veins of all the organs might not be exposed to this trouble, and if certain obscure objective phenomena might not be properly referred to such congestions. In the spring of 1867 I was consulted by a friend who, while in excellent health, had been attacked by hematuria, with weight and painful tension of the pelvis. There was not much loss of blood, and clear urine was often promptly passed after a free injection of liquids. The patient's doctors had prescribed astringents, ending with perchloride of iron. But these caused an aggravation of the symptoms and I asked myself if a varicose condition of the rectum, though it did not there cause hemorrhage, might not have extended to the lower portion of the bladder and have brought on the symptom. In this belief I prescribed tincture of carduus marianus twenty-five drops twice daily in a tumbler of water. There was an immediate amelioration of perineal tenesmus, and the hematuria ceased in a few days. The trouble appeared once again during the lifetime of the patient (he died of typhus five years after I first treated him), and the immediate use of carduus marianus arrested the hematuria from the start. My choice of car-

duus marianus (chardon Marie) arose from my observing the use made of it by Dr. Worms. Since then, my gynecological practice has offered a large number of examples of these painful œdemas arising from varicose stasis. They are often found in the urethra or meatus of women—alone or in conjunction with anal hemorrhoids — and, though rarely causing sanguineous discharge, gives rise to very painful dysuria. In some cases the pain is extreme and continuous in paroxysms for several days. For all of these patients I prescribe, first, twenty drops of the tincture of carduus marianus in a tumbler of water night and morning. In cases in which this is not sufficient, I practice rapid dilatation of the urethra with Blanchet's "auri-bivalve speculum," whose plates I elongate to seven centimeters. One dilatation is usually sufficient; sometimes a second, six months afterward, is needed; in one case which I have lost sight of, two dilatations were sufficient; in a certain number of cases I have kept track of, the cure remained permanent for ten or twelve years."

The veins may become sclerotic. According to Osler "sclerosis of the veins — phlebo-sclerosis — is not at all an uncommon accompaniment of arterio-sclerosis, and is a condition to which of late a good deal of attention has been paid. It is seen in conditions of heightened blood-pressure, as in the portal system in cirrhosis of the liver and in the pulmonary veins in mitral stenosis. The affected vessels are usually dilated, and the intima shows, as in arteries, a compensatory thickening, which is particularly marked in those regions in which the media is thinned. The new-formed tissue in the endophlebitis may undergo hyaline degeneration, and is sometimes extensively calcified. In a case of fibroid obliteration of the portal vein of long standing, I found the intima of the greatly dilated gastric, splenic, and mesenteric extensively calcified. In ordinary diffuse arterio-sclerosis the veins may also be involved, but rarely to a marked degree."

Treatment.—We have no clinical records upon which to base any treatment. Theoretically iodide of barium, iodide of potassium, phytolacca, and phosphorus ought to arrest or modify the degeneration process. A cure is probably not possible.

EMBOLISM.

Causation and Morbid Anatomy. — The sources of emboli are mainly venous thrombi, cardiac vegetations, and disintegrating calcareous, atheromatous, or inflamed surfaces. Additional sources are softening clots in the interior of the heart, and morbid growths or other adventitious bodies. The detached solid mass, whatever its nature, is carried along by the blood stream until it reaches a vessel which is too small to allow of its further progress. The point at which it becomes finally arrested usually corresponds to the bifurcation of a vessel or to the giving off of a comparatively large branch. Here it gets wedged, sometimes blocking up the channel completely, but more frequently forming at first a partial impediment only. In the latter case the constant pressure from behind tends to drive it farther and farther onwards, in consequence of which, or of the gradual coagulation of blood around it, the vessel becomes at length, as in the former case, completely occluded. Subsequently thrombosis takes place on both sides of the embolus; the artery and its distal branches get filled with clot which, gradually undergoing changes blends on the one hand with the arterial parietes, and on the other with the embolus. So that although the embolus may, at first, be readily recognized as an independent body, it often becomes undistinguishable from the thrombus to which its presence has given rise.

Emboli, taking their origin in the systemic venous system, or right side of the heart, necessarily become fixed in the pulmonary arteries. Those which originate in the pulmonary veins, left side of the heart, or larger systemic arteries, are conveyed to the periphery of the systemic arterial circulation. And those, lastly, which are yielded by the veins of the chylopoietic viscera find their resting-place in the branches of the vena portæ. Owing to the infrequency of disease of the valves of the right of the heart, embolism involving the lungs is almost invariably due to the detachment of venous clots or fragments of them. In some cases entire systems of thrombi become free, and a complete cast, some inches long, of a venous tree may be carried into the pulmonary artery and impacted in a convoluted form within it. More frequently shorter lengths get successively separated and successively lodged in different branches of that vessel. It is much more common, however, for venous clots to

crumble, as it were, gradually away; and for minute fragments to get impacted from time to time in the pulmonic arterioles.

It is rare for thrombosis to take place in the pulmonary veins; and hence embolism is seldom due to this cause. The most common source of embolism of the systemic arteries is undoubtedly the detachment of the granulations from the diseased aortic or mitral valve; but another frequent cause is the separation of atheromatous or calcareous particles, or other detritus, either from the valves or inner surface of the heart, or from the large arteries. It is obvious, therefore, that embolism of the systemic arteries must in a very large proportion of cases depend on valvular disease, and is to be regarded as one of the common risks of that affection.

Emboli from the various sources just indicated are carried along the aorta and thence into some of the smaller branches of the systemic arteries; whither is in some degree a matter of accident; but there are certain parts, namely, the brain, liver, spleen, and kidneys, and, it may be added, the lower extremities, which are specially prone to suffer. It is probable, however, that their arteries are not so much specially liable to obstruction, as that their obstruction produces particularly serious and obvious ill effects. The cerebral arteries chiefly liable to occlusion are the middle cerebral branches of the internal carotids; and it is curious that the stoppage generally occurs in the middle cerebral of the left side." (Bristowe.)

Treatment.— There are no specific remedies for embolism. The indications are to combat inflammation followed by local œdema. The most appropriate medicines are arsenicum, apis, bryonia, phosphorus, hamamelis, rhus tox., and a few others.

THROMBOSIS OF THE HEART AND ARTERIES.

"In the heart, after death, the blood which was contained within its cavities at the moment of death is generally found coagulated, moulded to the form of cavities, and continuous with cylindrical clots occupying the trunk veins, and often with similar clots extending into the trunk arteries. These clots are sometimes black-currant-jelly-like, sometimes partly discolorized; and the portions prolonged into the arteries are usually more or less purely fibrinous, while

those seated in the veins are usually soft and black. But not unfrequently the clots contained in the heart's cavities, and more especially those occupying the ventricles, are almost entirely fibrinous, opaque, and buff-colored, close in texture, and even indistinctly laminated. Arterial thrombosis is due in a large number of cases to simple stagnation of blood. Thus the arteries leading to a district, in which (owing to morbid processes going on in it) the blood has ceased to circulate, get filled secondarily with coagulum. And in precisely the same way, if an artery be ligatured, or obliterated at any point by the pressure of a tumor or tourniquet, the proximal portions of the vessel up to the nearest branch becomes the seat of thrombosis. Not unfrequently also, when the circulation is simply feeble, obliteration of an artery by coagulation of its contents takes place. This occurrence in the smaller branches of the pulmonary artery is a common cause of pulmonary apoplexy. It is occasionally also observed in the arteries of the extremities and even in the aorta itself. Diseases of the inner coat of arteries (atheroma, calcification, arteritis, and syphilis), are all of them liable to induce thrombosis and consequent obliteration. Among arteries especially liable to suffer thus are those of the base of the brain and of the extremities. The varieties of the arterial clots and the changes which take place in them are identical with those already described in connection with veins." (Bristowe.)

Treatment.—(See remarks upon Embolism and phlegmasia alba dolens.)

ARTERIO-SCLEROSIS.

(Arterio-capillary Fibrosis.)

"*Definition.*—A condition of thickening, diffuse or circumscribed, of the intima, consequent upon primary changes in the media and adventitia. The process leads, in the larger arteries, to what is known as atheroma or endarteritis deformans.

"*Etiology.*—As an involution process arterio-sclerosis is an accompaniment of old age, and is the expression of the natural wear and tear to which the tubes are subjected. Longevity is a vascular question, and has been well expressed in the axiom that 'a man is only as old as his arteries.' To a majority of men death comes

primarily or secondarily through this portal. The onset of what may be called physiological arterio-sclerosis depends, in the first place, upon the quality of arterial tissue (vital rubber) which the individual has inherited, and secondly, upon the amount of wear and tear to which he has subjected it. That the former plays the most important role is shown in the cases in which arterio-sclerosis sets in early in life in individuals in whom none of the recognized etiological factors can be found. Thus, for instance, a man of twenty-eight or twenty-nine may have arteries of sixty, and a man of forty may present vessels as much degenerated as they should be at eighty. Entire families sometimes show this tendency to early arterio-sclerosis, a tendency which cannot be explained in any other way than that in the make-up of the machine bad material was used for the tubing." (Osler "Practice of Medicine.")

The chief causes of arterio-sclerosis are alcohol, gout, and syphilis. It is supposed that plumbum and barium can cause it. Overeating may cause it by overfilling the blood-vessels, particularly in sedentary persons who take but little exercise. Overwork, which taxes the muscular strength, may cause it, by raising the blood-pressure in the arteries. Renal diseases, especially Bright's disease, may cause sclerosis, but it has not been proved whether the sclerosis is a primary or secondary affection. It is a fact, however, that the two diseases are generally found in the same persons. The main subjective symptoms of arterio-sclerosis are, (1) Increased tension in the vessels. (2) Hypertrophy of the heart due to this tension. (3) When the coronary arteries are involved there occurs thrombosis of the heart with sudden death, aneurism, rupture, and, most common of all, angina pectoris (although angina may occur when the coronary arteries are healthy). (4) The patient may suffer from all the symptoms of cardiac weakness, dyspnœa, scanty urine, and dropsy. The cerebral symptoms of arterio-sclerosis are cerebral hemorrhages, miliary aneurism resulting in apoplexy, hemiplegia, monoplegia, or aphasia. From these attacks partial or complete recovery may follow. The vertigo of arterio-sclerosis is often laid to other causes, as Manniere's disease, indigestion or billiousness. This vertigo has been well described by Prof. Archibald Church, of Chicago. He says:

"When a man past the prime of life, without any previous seri-

ous illness, becomes suddenly faint, has a swimming in the head, a feeling of giddiness of distinct gyration, of darkness, and impending death, or several of these sensations, he usually at once seeks advice in grave apprehension (sometimes well founded) of approaching cerebral hemorrhage, and usually gets a cholagogue cathartic, or is told that his stomach is wrong, and sometimes is told rightly. But cases are constantly presenting themselves in which such vertiginous attacks are happening at shortening intervals; the patient gives up his tobacco, his spirits (if he is a drinker), cuts down his meat, takes to some of the many waters recommended, has Turkish baths, and gains only moderate relief or none at all. If he is carefully examined he will probably present a well-defined tortuous frontal artery, a distinct arcus senilis, a strong, even a clanging, second sound of the heart, sometimes reduplicated, and yield a sphygmogram indicative of increased arterial tension. The pulse may be abnormally slow or arhythmic, the urine scant, and a trace of albumin is not rare. He finds that exertion of a moderate degree precipitates the attack, that he cannot endure a temperature at all above the usual, and often a change of position from recumbency to the upright is the occasion of a "blur" or of giddiness.

The attack itself is, as already indicated, widely variable in different patients. A fulness and throbbing in the head, a feeling of heat in the scalp, and a blur before the eyes are usually mentioned, and at such times marked paleness is noticed, followed, as a rule, by considerable redness of the face. There is a desire to get in the open air, and badly-ventilated or close apartments are unendurable. An habitual smoker will sometimes find tobacco smoke repugnant. In more severe forms, the patient may stagger, fall, or gradually sink to the ground; he cannot speak for a few seconds, though consciousness is rarely completely lost. The recumbent position is usually sought, or the patient clings to some object, and after a period of from five to twenty minutes the feeling passes away, leaving him rather languid, with an inclination to sleep, and usually mentally depressed and apprehensive. At first, he attributes the attack to anything and everything that in his estimation can cause a departure from health, and usually establishes a close watch upon his diet, habits, and mode of life; is inclined to avoid exercise or exertion of any sort, fearing to precipitate an attack, or to go by himself on the

streets — in short, becomes an invalid with hypochondriacal tendencies."

In a remarkable monograph on this subject, Professor J. Grasset, of Montpellier, divides the vertigo of arterio-sclerosis into three forms: (1) simple vertigo; (2) vertigo with epileptiform crises; (3) vertigo with slow pulse and syncopal or epileptiform attacks.

Osler says there are three forms of this disease, namely:

(a) "Nodular form," of which he says, "the affection is really a mesarteritis and a periarteritis, and which may lead to rapid dilatation or to production of an aneurism, particularly in the early stage. (For a complete description of the degenerative changes refer to Osler's "Practice.")

(b) "Senile Arterio-sclerosis.—The larger arteries are dilated and tortuous, the walls thin but stiff, and often converted into rigid tubes. The subendothelial tissue undergoes degeneration and in spots breaks down, forming the so-called atheromatous abscesses, the contents of which consists of a molecular debris. They may open into the lumen, when they are known as atheromatous ulcers. The greater portions of the intima may be occupied by rough calcareous plates, with here and there fissures and loss of substance, upon which not infrequently white thrombi are deposited. Microscopically there is extreme degeneration of the coats, particularly of the media. Senile atrophy of the liver and kidneys usually accompanies these changes. Senile changes are common in other organs. The heart may be small and is not necessarily hypertrophied. In seven of fourteen cases of Councilman's series there was no enlargement. Brown atrophy is common. (Osler.)

(c) "Diffuse Arterio-sclerosis. — The process is widespread throughout the aorta and its branches, in the former usually, but not necessarily, associated with the nodular form. The subjects of this variety are usually middle-aged men, but it may occur early." (Ib.)

Treatment. — In the early stages of sclerosis before any local symptoms are manifested, the patient should be frankly informed of his condition and the nature of the disease. He should be advised to abstain from the habitual use of alcohol, from large eating, especially of animal food, from drinking calcareous or iron waters, from extreme physical exertion, and if the patient is over forty from violent athletics of all kind. The urine should be kept free and abund-

ant by the use of pure or sodic waters and the bowels kept open by laxative food or laxative waters. I have already treated of the high tension pulse not due to sclerosis. This condition should not be confounded with the former. The remedies for sclerosis are mainly physiological, *i. e.*, those drugs which taken into the circulation act upon the coats of the arteries in such a manner as to prevent the hardening and degenerative process.

The principal remedies are the iodides of potassium, sodium, lithium, aurum, barium, and argentum. The old school all over the world seem to prefer the iodide of potassium, and their reported experience is on the whole very favorable. If the patient is strong and muscular the potassium salt is well borne, and capable of arresting and holding the disease in check. If the muscles of the patient, particularly of his heart shows any weakness the sodium salt is to be preferred. Potassium sometimes increases arterial tension, while sodium does not. The dose in general use is five to fifteen grains daily: patients require varying doses; I have found the dose most useful is from two to five grains three times a day. Under its use the tension, vertigo, dyspnœa, cardiac disturbances, etc., will soon show improvement in severity. It should be continued until the pulse is soft, even if it requires months. The other iodides can be chosen from the symptoms of the drug which is combined with iodine, as the iodide of gold for the senile melancholia, which is often a prominent symptom. Other medicines are phytolacca, veratrum viride, phosphorus, mercurius plumbum, (which is closely homeopathic), aurum mur. et sodii, and ergot (in case of gangrene).

The palliatives are (as in vaso-motor arterio tension, which sometimes complicates sclerosis) amyl, glonoine, nitrite of sodium, cobaltonitrite of potassium, gelsemium, and in rare cases aconite and piscidia. (This last drug in twenty to fifty drops has been found useful in angina pectoris.) Daily warm (not hot) baths by sponging, the rain-bath, or whole bath, are useful, for they relax the arterial coats.

The vertigo of arterio-sclerosis cannot be treated entirely symptomatically. Unless a medicine has a physiological or homeopathic relationship to the pathological condition it will not even palliate. The remedy which has given me the best results is zincum-phosphide in the 3x trituration. Both phosphorus and zinc are strictly homeo-

pathic to sclerosis of the arteries. The phosphide of lead should be equally efficacious, but I have never used it. Dr. Church recommends iodide of potassium. In some cases silica, calcarea, salicylate of soda, nickel, picric acid, and picrate of zinc are indicated.

There is a pulse just the opposite to that in arterio-sclerosis. Dr. C. L. Dana describes it as follows in a paper entitled "The Apoplectic Pulse and its Treatment." "There are many conditions of the heart, blood-vessels, and blood, underlying attacks of cerebral hemorrhage. I refer to a class of cases in which the blood-vessels become gradually dilated and tortuous. The pulse at the wrist is very full and not very hard; the temporal arteries are very prominent. The patients do not usually have much kidney or heart disease, though the latter organ is a little dilated. Between the ages of forty-five and sixty-five, *i. e.*, at the apoplectic period of life, these patients without warning, and usually while feeling physically, particularly well, have a more or less severe attack of hemiplegia. After the hemiplegia they suffer a long time, not so much from the paralysis which may be slight, as from mental and cerebral disturbances; they are greatly depressed and sleep badly, have vertigo, confusion of thought, cannot read or work, feel very weak, and are very nervous and emotional. They seem to be quite wrecked physically and mentally, and this is all out of proportion often to their paralysis or the brain lesion. This varies much in intensity in different individuals. They gradually improve under proper conditions; but may have another attack one to five years later.

A study of the pulse in these cases shows quite a different state of affairs from that formed in ordinary apoplectics. It is of extremely great amplitude; the pre-dicrotic notch is very deep and close to the percussion wave. The dicrotic notch is very deep and the dicrotic wave is short, so that the lever may fall to the respiratory line and make a horizontal line before it starts up on the next beat. The total area of the wave is small. All this means that these patients have had, for many years, an extreme peripheral resistance in the small arteries and capillaries. The heart pounds for years against the resistance, dilates the arteries, and becomes itself hypertrophied. The blood, driven with a quick stroke through the enlarged vessels, causes finally a rupture. The shock, or some other cause, then leads to a weakening of the heart. We have, as a result, a

sphygmograph showing a weak heart, large arteries imperfectly filled, a pulse that has relatively a low tension, and an abnormal peripheral resistance still present. This condition calls for a different treatment from that in apoplexy, where the arteries are greatly thickened, rigid, and the tension continues high. In the cases to which I call your attention nitro-glycerin, and arterial relaxers generally, do no good, except for a short time. They simply make the walls more flabby, but do not cause the vessels to be more filled. Strophanthus, and in some cases digitalis, however, strengthen the heart, tighten the vessels, and fill them better. But the essential thing still remains. These patients have all along had too great a peripheral resistance, which, as Broadbent shows, lies mainly in the capillaries. This is due to impoverished conditions of the blood or to diathetic irritations such as rheumatism, gout or lithæmia, or to other conditions causing atrophic kidneys. The physician, therefore, must, above all, attend to these points, and pay relatively little attention to the heart and arteries. I find that these patients improve most rapidly under the use of tincture of iron and salicylate of soda. These remedies, with spartiene, strophanthus, or digitalis, given occasionally are of enormous service, producing their effects at times almost magically. It is important to place these patients also on a diet of vegetables, fruit, a little meat and a moderate amount of milk. I believe that by watching the pulse and the urine, and by occasionally examining the blood of persons who have had one attack of hemorrhage, we can keep them from having a second seizure, at least until many years have passed. This it has always seemed to me is the true aim of the therapeutics of cerebral apoplexy. I call attention to this particular condition because I believe the treatment indicated is different from that in other types in which iodides, glonoine, mercury, and other drugs may be much more specifically indicated. I believe that it is always accompanied by cerebral hemorrhage, never by thrombosis. Cerebral hemorrhage, however, may and often does occur in persons who have rigid and atheromatous arteries which are not dilated. On the other hand, many persons with very dilated arteries do not have hemorrhage, though they are liable to it. The pulse is essentially one of hemorrhage, and its presence may forewarn, and may help in diagnosis and treatment. The serious and important feature in these pulse curves is the depth of the predi-

crotic notch. This, with the vertical line of ascent, shows a much dilated artery whose walls have lost resistance. The deep dicrotic notch indicates a weak heart and imperfectly filled arteries. While this condition is one free from risk of hemorrhage, it indicates a badly nourished brain, and the patients with it complain much of insomnia, vertigo, mental confusion, and depression."

RESUMÉ.

(1) There is a class of cases in which the arteries are extremely dilated and their walls thin and soft, giving a characteristic sphygmogram showing so-called virtual tension.

(2) Persons with this pulse, if they have apoplexy, have hemorrhage, not thrombosis.

(3) The treatment is different from that indicated for persons who have rigid arteries and actual high tension.

(4) The treatment is essentially directed to strengthening the vascular system and lessening peripheral resistance as specifically indicated above.

(5) Careful watching of these cases enables one to protect them against other attacks."

The medicines homeopathic to the above condition are secale, hydrastis, ustilago, millefoil, trillium, zinc phosphide, and ferrum phosphate. They are most appropriate in the third attenuation. As for physiological remedies I should prefer coronilla or convallaria to digitalis. Salicylate of soda should not be given in larger doses than one or three grains 1x or crude every four or six hours.

THE GEOGRAPHY OF HEART DISEASE.

After considerable investigation of this subject I have arrived at the conclusion that any attempt to define the geographical limits of all heart diseases is almost an impossibility. Idiopathic inflammatory cardiac diseases are very rare, and when they do occur may arise in any climate and in any country. Inflammatory diseases of the heart are generally secondary, or are caused by some constitutional disease. Therefore, we are obliged to ascertain the geographical limits of those diseases which cause them. This we can do with

considerable accuracy. The constitutional diseases which are most likely to cause cardiac disorders are: (1) Rheumatism, and (2) Bright's disease, to which may be added as occasional causes, la grippe, scarlet fever, and diabetes.

In comparing the mortality statistics of rheumatism, Bright's disease, and diabetes, I find that the same climatic influences induce them all. The statistics collected by Dr. C. W. Purdy are very instructive. He found that Bright's disease was most common in the following states—I give them here with the ratio of deaths from Bright's disease per 1000 deaths from all other causes.

New Jersey	28·55	California	7·02
New York	20·13	Michigan	5·06
Connecticut	14·48	Minnesota	3·86
Massachusetts	13·00	Ohio	6·00
New Hampshire	12·70	Pennsylvania	7·68
Maryland	11·52	Wisconsin	4·99
Vermont	10·33	Illinois	4·73
Maine	9·34	West Virginia	4·46

It will be observed that all these states lie north of "Mason and Dixon line." It is in these states that statistics show that rheumatism and Bright's disease is most prevalent.

The climatic condition of these states consist of coldness and dampness mainly, and often of high altitude. We will now glance at those states where Bright's disease is less frequent.

Arkansas, percentage to 1000	1·95	Missouri	2·89
Georgia	1·67	Nebraska	1·68
Indiana	3·46	North Carolina	1·85
Iowa	3·45	South Carolina	2·47
Kansas	2·50	Tennessee	1·11
Kentucky	3·28	Texas	2·14
Mississippi	2·60	Virginia	2·95

Florida is not given, but I believe from my observations and interviews with physicians of that state that the percentage is less even than in Georgia and other Gulf states. You will observe the contrast between West Virginia, which is mountainous, very damp and cold, and East Virginia, which is warmer, lower, and less humid. The percentage in the former is double that in the latter. The statistics of rheumatism conform with that of Bright's disease in the Southern states; as in West Virginia, with its coldness, moisture, and high altitude, there rheumatism is more prevalent.

The following grouping was suggested by Mr. Gannet, the geog-

rapher of the census. It gives clearly the regional geography of Bright's disease.

"DEATHS FROM BRIGHT'S DISEASE IN EACH 1,000 DEATHS IN THE UNITED STATES FOR 1880.

IN GRAND GROUPS, SHOWING CLIMATIC FEATURES AND POPULATION.

REGION.	Ratio to 1,000.	Mean Temperature. F.	Mean Rainfall in Inches.	Elevation in Feet.
1. North Atlantic Coast region.....	17·38	40–50°	40–50	100– 500
2. Middle Atlantic Coast region....	19·73	45–60	45–55	Below 100
3. South Atlantic Coast region.....	2·59	60–65	50–60	Below 100
4. Gulf Coast region	9.41	70–75	55	Below 100
5. Northeastern hills and plateaus..	11·20	35–45	35–45	500– 2,500
6. Central Appalachian region	8·23	40–45	35–40	Above 500
7. Northern lake region	7·17	45–50	30–40	200– 300
8. The interior plateau region.....	8·32	45–50	40–45	100– 200
9. The Ohio River belt.....	5·83	45–55	45–50	300– 1,000
10. Southern Central Appalachian region.....	2·63	45–55	45–50	1,000– 2,000
11. Southern interior plateau	2·99	67–70	50–60	Below 1,000
12. South Mississippi River belt.....	3·14	60–65	50–55	100– 300
13. North Mississippi River belt	3·73	40–50	30–50	Above 500
14. Southwest central region.....	1.97	60–70	35–50	100– 500
15. Central region (plains, etc.).....	3·70	50–60	40–45	500– 1,500
16. Prairie region	3·59	50–55	25–40	About 1,000
17. The Missouri River belt.....	2·80	40–55	20–40	500– 1,000
18. The Northwestern region	5·21	40–50	30–40	Above 1,000
19. Pacific Coast region	8·72	45–65	20–60	100– 2,000
20. Region of Western plains.....	3·92	45–65	10–20	1,500– 5,000
21. The Cordilleran region.....	3·04	50–60	10–20	4,000–10,000

Turning to the statistics of diabetes (glycosuria), we find that it agrees very nearly with that of Bright's disease.

The states where it is most prevalent are:

Vermont (percentage to 1000) .	6·36	Indiana.....	2·72
Maine.....	4·41	Iowa.....	2·42
Connecticut	3·37	Michigan	2·68
Ohio.....	3·23	Wisconsin.....	2·81
New York	2·20	Massachusetts.....	1·96
Illinois	2·11	California.....	1·99

The states in which the disease is least prevalent are Alabama, Arkansas, Georgia, Kansas, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, North and South Carolina, Pennsylvania, Texas, and Virginia. In these states the death rate ranges from about .60 in Alabama, Arkansas, Minnesota, and Tennessee, to an average of 1.50 in the other states.

The regional geography of Bright's disease and rheumatism is very similar to that of diabetes. In other words, the mortality increases as we go from the Gulf and Southern Atlantic states to the Northern and Middle states, the region of the North Atlantic Coast, the shores of the Great Lakes, and the North Pacific states.

Different parts of each state are not equally causative of rheumatism or Bright's disease. I call your attention to the difference between Virginia and West Virginia. The same difference is probably found in those states which are partly flat and partly mountainous. In the regions of highest altitudes heart diseases will be more frequent than on lower ground, especially in the Southern states. Even in the Northern states, I think, the same difference will obtain. There may be some exceptions to this rule, as when the high lands are dry, as in the mountains of North Carolina, Georgia, New Mexico, and Arizona.

The geography of functional diseases of the heart, whether arising from some irritation or lesion of the cardiac nerve-centres in the brain and spinal cord, in the nerves of the heart itself, or reflexes from irritation of other and remote organs, cannot be given with much accuracy. I can only suggest that all functional affection, local or reflex, to which the heart is subject, are more common in large towns and cities than in the country and rural villages. This is due to the excitement and competition in all kinds of business, and the rush and worry of the intense social life; to which may be added the prevalence of dyspepsia, hepatic disorders, and affections of the female reproductive organs. I believe it can be substantiated that these functional disorders are more common in Northern than in Southern cities; and oftener found in the cities of high altitudes than in those on the plains.

In my studies of English and Continental authors, I find that the cold, humid and high altitudes in those countries are considered to be the chief habitat of inflammatory diseases of the heart. I cannot find any definite information as to the localities where functional disorders most prevail, but I see no reason why the chief cities of England and the north of Europe should not be as much a source of these disorders as in the United States. As for the geography of heart disease in Asia, Africa, Australia, and South America, no statistics are obtainable by me, but I believe the same

laws prevail in those countries as in North America. In a paper of this scope, I am not supposed to give any practical deductions which would apply to the treatment of cardiac disorders. Nor is it really necessary, for the inference is plain; that as an aid to treatment, the sufferer from cardiac diseases should seek those regions and climates in which Bright's disease and rheumatism are least prevalent.

A review of these investigations substantiates the following conclusions:

(1) That the chief features of climate in the United States which most strongly tend to increase the death rate from inflammatory, acute and chronic, heart-disease, are cold, moisture, and changeability of temperature.

(2) That the elements of climate which tend in the greatest degree to decrease the death rate from such diseases are warmth, dryness, and equability.

(3) That cold most markedly increases the mortality from heart-disease when associated with moisture, a comparatively low temperature being well borne if the atmosphere is a dry one.

(4) That a comparatively high degree of humidity of the atmosphere does not markedly increase the mortality from heart disease if accompanied by warmth and equability.

(5) That the most unfavorable residence localities for patients afflicted with heart disease in the United States are comprised within the Atlantic Coast region and Northeastern hills, which include the states of New Jersey, New York, Connecticut, Massachusetts, New Hampshire, and Vermont; also those regions of high altitude which comprise the states of Colorado, California, and Oregon.

(6) That the most favorable residence localities are chiefly within the Southern interior, and especially include the states of Tennessee, Georgia, North Carolina, Arkansas, Texas, Florida, Arizona, and New Mexico.

(7) Finally, a practical lesson may be learned from these investigations as follows: That, since climate so decidedly influences the mortality from heart disease, those who are afflicted with the disease or possess strong hereditary or other tendencies thereto should wear such garments as most directly tend to neutralize the evil influences of climate over the disease — viz., those combining the minimum

power of radiation of body heat with the highest hygroscopic properties; and since *wool* possesses these qualities to a degree unapproached by any other textile, all-wool garments should be worn next the skin throughout the year.

Another deduction relating to functional disorders of the heart may be stated as follows: In view of the fact that these disorders are more frequent in large towns and cities, especially in high altitudes and latitudes, it behooves physicians to order such patients whose disorders are not relieved by medicine or hygiene, to remove to the country or small villages in those regions which possess a warm equitable climate, in warm valleys and plains of low altitude. As for those diseases which are universal, namely: la grippe, scarlet fever, typhoid fever, and certain specific maladies, they have no geography. We can only say that they are more prevalent in large cities along lines of travel.

In this we may also include cases of heart-strain from undue exertion: the abuse of alcohol, and the excessive use of coffee, tea, and such drugs as quinine and the so-called antipyretics.

NON-MEDICINAL METHODS OF TREATING DISEASES OF THE HEART.

There have been several such methods practiced from time to time. Some of them have been tested and found inadequate—too much was claimed for them by their enthusiastic originators. One of the earliest methods was that of hydropathy, introduced and practiced by Priessnitz. While this method was sometimes successful in the hands of its founder and his followers, its failures were many, and the treatment often disastrous. But Priessnitz's early methods have been greatly improved upon. The latest and best application of hydrotherapy as practiced by Dr. Simon Baruch, of New York, if properly carried out, has been attended with very gratifying results. The milk-cure, so-called, has been quite successful in some desperate cases as illustrated by the following case narrated in the "St. Peterburg Med. Wohn.," No. 32. He refers to the "Carell Milk Cure Method." Dr. Koppel, the reporter, states it was a case of dilatation of the heart, which he treated first with the milk-cure and then with

digitalis. The patient was a man, twenty-nine years of age, whose father had died at fifty of heart disease, and who had a brother also with that disease. He had passed through both scarlet and typhoid fever as a child, but does not appear to have any heart trouble until much later. During a couple of years he noticed that his pulse was very frequent. He smoked a great deal and drank deeply; according to his own account, he had, however, for a year reduced his potations, only taking two bottles of beer and a half-bottle of Madeira daily. The first sign of his trouble appeared in the summer of 1890, when, on the occasion of a fire at his store, he fell fainting, after running a short distance. He soon regained consciousness, and noted no change in his health. In the winter he suffered severely from influenza, only recovering very slowly, and in the spring following he gradually lost strength. About a week after his marriage, which occurred in July, 1891, he was seized with weakness at a company, and was taken home in a carriage. Difficulty in breathing and faintness occurred often, with swelling of the feet.

When he came under Dr. Koppel's care, he showed a massive bony structure with a moderate amount of fat; his face and upper extremities were somewhat turgid and slightly cyanotic; the lower extremities were œdematous, thorax normally formed. The lungs showed vesicular breathing in front; behind, especially in the lower portions, moist râles; slight bodily exertion caused increased dyspnœa. He had a hard, frequent cough. The impulse of the heart's apex was neither visible nor perceptible to the touch, while there was a diffuse palpable arching forward of the region of the heart; epigastric pulsation plain. Diagnosis was: Dilatation of the heart, probably caused by a fatty degeneration of the heart-muscle as a result of alcoholism. The milk-cure was used during ten days with general improvement. The milk-cure is in a measure a hunger cure; but, as Hirschfeldt has noted, such a scant diet can be easily endured for a couple of weeks. It does not strengthen the heart-muscle, but aids it by lessening the demand upon it, so that they are not too great for a comparatively weak heart."

The digitalis given after the milk-cure was abandoned produced a temporary strengthening of the heart's activity. Carell gives twenty to twenty-six ounces of milk daily to begin on, increasing it to seventy-five ounces very soon; after this the deficient nourishment may be

made up by three ounces of zwieback. Koppel gives a carefully prepared table, showing the results obtained during the milk-cure."

The "grape-cure" is credited with many successes. It consists, as nearly as I can ascertain, in confining the patient to a diet of grapes almost entirely, to which is sometimes added a small quantity of bread or zwieback. Somewhat similar is the "whey-cure," practiced in some parts of Germany and Switzerland.

Oertel's system, which consisted of gymnastic exercises—principally mountain and hill climbing—was fully described in my "Lectures on Diseases of the Heart," third edition. The chief aim of this method is to develop the muscular tissue of the heart by such exercises as tend to increase its action in a methodical manner. Dr. William A. Hammond advises systematic stair-climbing as equally beneficial. But this method can only be useful in dilatation, and in certain nervous and degenerative diseases. It can by no possibility be useful in arterio-sclerosis, angina pectoris, or hypertrophy.

Massage of the heart has been advocated and practiced, but I cannot conceive how it can be used except in a very few cases. The manipulations, as advised, consist in pressure made in various directions upon the walls of the thorax in such a way as to affect the heart.

SCHOTT'S METHOD OF TREATMENT OF CHRONIC DISEASES OF THE HEART.

A novel method of treating diseases of the heart, and one that is yearly growing in favor with the medical profession of Europe, is the balneological gymnastic method of Schott. This treatment was originated and developed at Bad-Nauheim, Germany, not far from Frankfurt-on-the-Main, and has been employed by the physicians of the place for the past ten years or so. Dr. Beneke was the first to announce the beneficial effects of balneological treatment in cases of heart disease due to recent endocarditis resulting from articular rheumatism. But two brothers, Dr. August Schott, deceased, and Dr. Theodore Schott, are entitled to the credit of having applied it to chronic diseases of the heart, organic and functional, and of having brought it to its present perfection. And to them alone belongs the merit of having devised the system of light gymnastics which forms an important feature of this Schott method.

The waters of Bad-Nauheim are not only rich in chloride salts, mainly chlorides of sodium and calcium, but are highly charged with carbonic acid. At first patients are given baths that are simply saline devoid of gas, and later on, as their condition permits, effervescing baths. The temperature of the baths varies from about 32.6° C. At first to 30.5° C. or even lower in exceptional cases. Gradually as the patients learn to bear the lower degrees of temperature, the proportion of salts is increased and the duration of the baths is lengthened to eighteen or twenty minutes. But one bath is taken daily and as a rule it is omitted every fourth day, the frequency of this omission being determined by the condition of the patient. Bathers are instructed to remain motionless during the bath, and afterward to lie down warmly covered and rest for at least an hour.

The salts and carbonic acid stimulate the heart reflexly through the impression made upon the sensory nerves of the skin, the stimulus thus produced being conveyed to the nerve-centres and through them to the heart. Cardiac energy is increased and the rate of cardiac contractions is diminished. This is shown by the pulse, which becomes slow, full, strong, and regular; indeed, the quality of the pulse is so greatly improved that a pulse weak before the bath becomes almost incompressible toward the end of the bath. Still more striking evidence of the effect on the heart is obtained by percussion of the organ. If the area of deep-seated cardiac dulness be carefully outlined just prior to a bath, and this procedure repeated immediately thereafter, the field of dulness will be found to have diminished in all directions, thus showing actual lessening in the size of the organ.

Subjectively patients experience but slight discomforts. The initial sense of chillness is quickly succeeded by agreeable warmth; if some oppression of the chest or epigastrium be experienced at first, it will be found to lessen with each succeeding bath; dispœna is not occasioned, but on the contrary the respirations are rendered deeper and less rapid. Increased flow of urine after the bath betokens the diminished passive hyperæmia and improved arterial circulation.

A course of such balneological treatment averages about seven weeks, after which a month of rest is advised, followed then by a second shorter term of baths.

The second and highly important feature of this method consists of light exercises. These "gymnastics" are made up of movements

of extension, flexion, and rotation of the extremities and trunk. They are made slowly and steadily with a brief pause for rest after each movement, and carefully apportioned resistance is applied by a trained attendant. It should also be the duty of the attendant to watch the pulse and respiration, and insist on rest so soon as circulatory or respiratory embarrassment is detected.

Carried out in this manner the gymnastics exert the same favorable effect on the heart as do the baths. It is, however, not quite so pronounced or enduring, and of course is brought about through the motor nerves. These exercises are also given once a day.

According to Dr. Schott this treatment is suitable to all forms of chronic heart diseases excepting pronounced general arterial sclerosis and aneurisms of the heart or great blood-vessels, or, in other words, conditions in which heightened intra-vascular and intra-cardiac blood-pressure would be dangerous. Valvular lesions and dilatation of the heart from over-strain form official indications for this method.

Fatty degeneration and chronic myocarditis, provided the heart-muscles be not damaged beyond all possibility of repair, are also favorably influenced. Inorganic diseases, such as the so-called "curable mitral regurgitation," are cured and more speedily than any other mode of management. Neurotic hearts and the functional disturbance of Graves's disease are likewise remarkably affected for the better. Moreover, a special recommendation of this method consists in the fact that loss of compensation does not contraindicate its employment, as is the case with Oertel's system of mountain climbing. To be sure, the Schott method will not cure or even permanently benefit all cases of heart disease in which the organ is damaged beyond the possibility of repair, but the results already obtained seek to prove it to be more efficacious in this class of cases than any other known mode of management. Its chief drawback lies in the fact that the paraphernalia requisite for its employment, including a corps of trained attendants, and the possibility of harm being done by ignorant or unskillful practitioners, renders its employment by the general physician unpracticable, and that therefore it must be left to specialists in the treatment of cardiac diseases.

Finally, although natural waters are employed at Bad Nauheim, Dr. Schott advised its use by means of artificial waters, which if

properly prepared are capable of producing the same favorable results.

Accordingly there are two establishments in which the method is now carried out in this way. One is in Copenhagen, Denmark, under the charge of Dr. Israel, and the other is in Chicago.

Dr. Robert H. Babcock, who has supplied the author with this description of the Schott method, derived his information from a personal investigation of the treatment at Bad-Nauheim, whither he went for the double purpose of treatment and acquiring practical familiarity with the details of the method. He had suffered for ten years with heart disease. His trouble dated from severe and repeated over-strain, but owing to a mitral murmur had been considered a chronic endocarditis induced by the too great and repeated physical effort acting on valves already somewhat damaged by an attack of scarlatina in childhood. Upon arriving in Bad-Nauheim he presented all the signs and many of the symptoms of dilatation of both ventricles. A mitral murmur was audible. At the end of five weeks, after he had taken but twenty-seven baths and the gymnastics for four weeks, his heart had returned to a normal size and the apex murmur had been converted into a prolongation of the first sound. His heart has remained normal since, although he has stopped gymnastics and all other forms of treatment. The Doctor is so enthusiastic over this treatment that he has established bathrooms and is now employing the treatment.

CHAPTER IX.

DISEASES OF THE NERVOUS SYSTEM.

STRIDULOUS LARYNGISMUS.

(False Croup, Spasmodic Croup, Laryngismus Stridulus.))

Definition.—A spasmodic irritability of the glottis. This is often mistaken for true or membraneous croup, but it is a distinct affection, and never runs into membraneous laryngitis. It is usually caused by a cold, which primarily attacks the larynx; or a coryza which extends downward from the nose to the pharynx and larynx. It is rare under two years of age and over seven. The children are not sickly-looking, they are generally healthy and robust. The tendency seems to be hereditary, for it appears in families for several generations, which is not the case in true croup. When death does occur, which is rarely, it is caused by a violent spasm of the glottis, for post-mortem examinations show no membrane, only an excess of mucus, and the glottis and vocal cords but little altered.

The child affected with this disease may have a slight coryza during the day, or is put to bed well, when about midnight or in the early morning hours awakes with oppressed breathing, harsh croupy cough, and perhaps some huskiness of voice. The oppression and distress for a time seems very serious, but it passes off in an hour or two, when the child falls asleep and awakes the next morning feeling well. These attacks are repeated two or three nights in succession, rarely longer. During the day the child may appear perfectly well, but in many instances is hoarse, has a brassy, barking cough, and a slight fever. These symptoms often alarm both parents and physician, who fear true croup. But true croup has a prodromic stage of several days, during which the child feels ill, is hoarse, and the croupy cough and stridulous breathing increases.

Treatment.— In ordinary cases no treatment is really necessary.

The symptoms spontaneously subside after the third night, leaving the child well, or with a slight catarrhal bronchial cough. In the early days of homeopathy, all croups were thought to be the same, and absurd claims were made for cures of croup, when no such claims were admissible. Benninghausen and others, and even some members of our school in this country to this day, assert that the three medicines, aconite, hepar sulphur, and spongia, are specific against dangerous croups. With a charlatinism which should be condemned they prescribed nine powders, three of each to be taken daily (each in the 30th); and this without regard to the dictum of Hahnemann, who declares that we must prescribe by the totality of the symptoms in every case. The fact is, that aconite is rarely called for.

Gelsemium is generally indicated if there is slight fever during the day, aggravated at night, but often there is no fever day or night.

Hepar sulphur is indicated in the majority of cases, and if given during the day, will usually modify, never altogether prevent, the attacks on the second or third night.

Spongia may be useful, but only because it contains a trace of iodine and bromine, which are useful in both catarrhal and membraneous croup.

Sanguinaria was considered a valuable remedy in all croupy coughs by the early botanic and eclectic physicians, and has sustained its reputation in our school. I doubt if it will cause membraneous laryngitis; it does, however, cause a severe laryngitis, without the spasmodic element. The same may be said of hepar sulphur.

Sanguinaria nitrate, however, is more poisonous, and may cause false membranes.

When the physician is called at night, to see a child with spasmodic, croupy cough, he is expected to do something promptly. He generally, following the traditions of our school, gives hepar sulphur and spongia. These may modify the laringeal irritation, but not immediately. If continued through the day they are useful, but they do not help the spasm during the time they are given. The immediate remedies should be ipecac, belladonna, or gelsemium, as the symptoms demand. At the same time the throat should be swathed with warm water, after rubbing in vaseline, olive oil, or any oleaginous substance. During the day-time the child should be kept in the house if the

weather is cool, and the room in which the patient stays should be at a temperature of 70° or 75° day and night, until the disease has subsided.

On account ot the value of chloride of gold in spasm of the larynx (laryngismus stridulus), I have used in several cases iodide of gold for the spasmodic symptoms, when the child started up out of sleep, with a frightened expression and a crowing cough. It has acted favorably, and I recommend it in such cases in the 3x trituration. It should be kept in dark-glass bottles.

PARALYSIS AGITANS (Shaking Palsy, Tremors).

Definition.—A chronic affection of the nervous system, characterized by muscular weakness, tremors, and rigidity.

Men are said to be more frequently affected than women. It rarely occurs under forty, but I know of two cases in women who were attacked at thirty without any assignable cause. It cannot be said to be hereditary, but its victims generally belong to neurotic families. Exciting causes are, exposure to cold and wet, business worries and anxieties, severe mental shock, and traumatism. I have seen it occur after cerebro-spinal and typhoid fevers.

No constant lesions have been found, but there are certain features described by Parkinson which suggest that it may be caused by premature senility of certain regions of the brain. Certain portions of the brain may grow old before the others. Dubief says it is not a neurosis but a cerebro-spinal senility, differing from true senility only by its early onset and greater intensity. The disease begins gradually, unless due to a shock or injury. It may begin in one hand. It may be constant or intermittent. It may be associated with weakness and stiffness. It is aggravated after exertion, and is to a certain extent under the control of the will. It is readily diagnosed, and cannot be mistaken for chorea, except by the most superficial observer, but may be mistaken for insular sclerosis. Only the hands and feet may be affected; the movements of the thumb and forefinger resemble the motions made in the act of rolling a pill. The ankle and wrist joints are weak. When the whole hand shakes it is not vertical but rotary. Any emotion exaggerates the movements. The attempt at a voluntary movement may check the tremor; the patient may be

able to thread a needle. One of the greatest surgeons of this country was able to perform the most delicate operations on the eye by an effort of the will, although before the moment of operation the shaking of his hands alarmed the spectators. The tremors, as a rule, cease during sleep, but not when the muscles are in repose when awake. The writing of the patient is tremulous and zig-zag. When the head is affected, the shaking may be vertical or rotary. Some authors deny that it affects the head, others (Bristowe) say the head is often affected. I am sure I have seen several cases of head tremors not due to sclerosis.

There is always weakness and slowness of movement, but not complete loss of power. The rigidity of muscles of voluntary movement is marked. The attitude and gait are peculiar. The head is bent forward, the back is bowed, the arms held away from the body. The face is devoid of expression, and the lips move slowly. The voice is apt to be shrill and piping, and there is hesitancy in beginning a sentence, then the words are uttered rapidly, contrary to what occurs in insular sclerosis. In attempting to walk the steps are short and hurried. The patient appears to be running after his centre of gravity, but if he attempts to walk backward he falls over, after a few steps.

Abnormal sensations of heat and cold are common. The mental conditions rarely show any change. Neurologists pronounce the disease incurable, but advise arsenic, hyoscyamus and opium, as palliatives. Hydrochlorate of hyoscine will give more relief than any other medicine. Many cases have lately been reported which improved greatly under its use in doses of 1-250th and 1-100th of a grain, three times a day. Even these doses often aggravate some of the symptoms of the disease. In my cases I gave the 1-500th of a grain with decided benefit, and without causing the slightest pathogenetic symptom.

Dr. Samuel Worcestor (Arndt's "System of Practice"), says: "Plumbum and tarantula are the only two medicines from which I have seen good results." He says the cases were not cured, only benefited.

Dr. Goss ("Practice of Medicine") recommends rhus tox., stramonium, and phosphoric acid, but I fail to find any cures made by them.

Rhus may cure tremor of certain muscles and tendons when it has a rheumatic origin from exposure to cold and wet.

Baryta muriatica should be tried. It is the great remedy for general or partial premature senility. It may be found curative in recent cases.

Physostigma is recommended when no structural lesion exists, but it has been tested in European hospitals without good results.

Sparteine sulphate has lately been used with good palliative effects for tremors due to various causes, and we may find in it a good palliative in paralysis agitans, and the tremors of tachycardia (exophthalmic goitre). Dr. Potts ("Therapeutic Gazette," June, 1892) reports several cases of tremors of the hands which were greatly benefited by sparteine. One, a man of seventy-three who had fine tremors in both hands, no paralysis anywhere, knee-jerks decreased, arteries hard, marked venous congestion of the face, and loud systolic murmur at the aortic orifice. Sparteine was given to improve the condition of the heart, which it did, and the tremors almost ceased (an accidental discovery of its usefulness). Another case of violent tremors of both hands, with headache involving the entire head, had no heart disease but was easily excited or worried and had trembling of the tongue. He was greatly improved, but on taking arsenic and strychnine, the tremor returned; and improved again under sparteine. It improved three cases of tremors in neuræsthenics; two old hemiplegics, one of locomotor ataxia, and one of meningitis following sunstroke, but did not benefit an old case of paralysis agitans. I think it would benefit morphine-eaters' tremors, and the tremors due to excessive use of tobacco and tea. The dose used by Dr. Potts was one-fourth to one-half of a grain three times a day; the 1x and 2x should be tried. It may act by improving the action of a weak heart, and giving it force to supply the senile areas in the brain with a normal amount of blood.

The tremors of hysterical women are removed by scutellarin, asafœtida, and platina. If from fright, I have seen excellent results from aconite and ignatia. A patient of mine with tremors of the hands and head consulted Brown-Sequard in Paris. He prescribed a pill of the extract of cannabis indica one-eighth of a grain, phosphide of zinc one-tenth of a grain. She improved for a time under its use, but it was only a palliative.

Phosphide of zinc 2x has cured mercurial tremors; several cases are on record.

The tremor of insular sclerosis is not amenable to any treatment yet discovered. Hammond recommends chloride of barium (baryta mur.) in one-tenth of a grain doses, but no actual cures have been reported. Phosphide of zinc and argentum muriate have been recommended.

The eye tremors (rapid oscillary movements of the eyeballs, nystagmus) will be benefited by agaricus, if by any medicine.

The percenta (nerve vibration) has proved of benefit in several cases. The application should be with the small point, over the tendons on top of foot near base of each toe, over nerve behind each maleolus, over radial nerve at wrist and ulnar at elbow, of each arm. With large plate over sole of foot and along each side of spinous processes. Applications should be made daily.

CHOREA.

Definition (St. Vitus dance).—May be in general terms defined as a disease of incoördination. Whatever the primal cause is, this term expresses the symptoms. The commencement may be so slight as to attract no notice. I have often been the first to notice it in families under my observation. A slight exaggerated wink of one eyelid, a twitch in the lips, or in a single muscle on one side of the face, is often the first symptom, which may persist for months before it extends to other muscles. In fully developed chorea, the patient is a most pitiable object. He cannot exercise any voluntary movement, and the convulsive motions are so severe as to prevent walking or standing. He is violently jerked in all directions, breaking bones, and bruising the tissues. The mind is usually affected from the first, and in the worst cases an almost idiotic state is present. There is a *hemi-chorea* where the spasmodic movements are confined to one side; a *chorea paralytica*, where the paralyzed side is affected; and a *post-paralytic* chorea, when the spasmodic movements set in after a paralysis; this last resembles paralysis agitans. It has been claimed by some authorities that many, if not the majority, of cases are caused by rheumatism. Others claim that the initial irritation commences

in the eyes, an "eye-strain." I have observed that a majority of all my cases occurred just before puberty.

Fright is a common cause. Any sudden mental shock may excite the disease. It is often caused by worms in the intestines. Dr. H. C. Wood, in the "Therapeutic Gazette," 1885, mentions an intractable case that nearly destroyed life, but which ceased on the expulsion of a tape-worm. Another violent case was immediately arrested by the removal of lumbrici.

The cause may be peripheral. A case of chorea which had lasted two years was cured by removing the roots of a tooth. Another of six-months duration was cured by the removal of a neuroma from the foot.

Chorea may arise from organic disease of the brain, and is then incurable. It may arise from functional derangement of the brain, and is then curable. It may be caused by organic or functional disease of the spinal cord. It may be epidemic, or the result of irritation. In several instances I have known a school broken up by one choreic child, all the rest involuntarily imitating his spasmodic movements. It is impossible in some cases to distinguish chorea from hysteria. It occurs frequently in animals, especially in highly domesticated breeds of dogs and cats.

The diagnosis of chorea from paralysis agitans, epilepsy, locomotor ataxia, cerebral and spinal scleroses, should be studied.

A knowledge of the cause of the disease may enable us to make a quicker cure, by removing such cause. It may aid us in the selection of the remedy in some cases. But as in most diseases, our real curative agents are selected by the resemblance of their symptoms to those of the disease; a correct diagnosis of the pathological cause is not necessary.

Treatment.—The surroundings of the patient should be made favorable to quiet of body and mind. A child or young person should be taken out of school until cured; it should not be under any excitement or see anyone with the same disease. It should not be talked about, or attention called to its movements, in its presence. It occurs in both plethoric and anæmic subjects.

Of all medicines arsenic is credited with the greatest number of cures. It is singular that Hart in his "Nervous Diseases" does not mention it. It is more singular that Lilienthal does not men-

tion it. Hughes barely alludes to it. On the contrary, the old school considers it, as Hammond declares, "*almost specific.*" Other authorities are equally confident of its value. There are several proprietary nostrums which are successful in the cure of chorea. All contain arsenic, as I know by analyses, and by watching their effects when taken too long. The pathogenesis of arsenic abounds with symptoms simulating all kinds of nervous diseases. Why then have our school ignored it? I cannot answer the question. But I know that my success in the treatment of chorea was indifferent until I used it.

The only reason why arsenic is not put down in our text-books may be, that it will not cure in the dilutions above the second. But this should not be a valid reason. Homeopathy is not a matter of dose, but of law, and if a drug like arsenic cures only in material doses, it is as much homeopathic as if the cure were made by the 200th. I do not prescribe the heroic doses advised by those who direct it to be given until it causes gastric irritation and puffiness of the face. They advise for a child five drops of Fowler's solution after meals, increasing the dose one drop each day until the above symptom appears. I commence with one drop, in water, after each meal. For some reason this preparation seems to act better than any other. I increase one drop a day for ten days, then decrease for another ten days. If at the end of the twenty days no improvement appears, I think it is useless.

Dr. Radcliffe, of England, and Dr. J. Lewis Smith, of this country, introduced the method of giving it by hypodermatic injection. Dr. Hammond says he uses it in that manner in all obstinate cases. He warns against improper methods of using the injections. He says it will cause abscesses and painful cutaneous inflammation. He says the safest location is on the front of the forearm, about midway between the wrist and elbow. "Here the skin is loose and can easily be lifted up by the thumb and finger from the tissues below. The arsenic should be deposited just under the skin in the cellular tissue, and not in the substance of the muscle or skin. The point of the syringe should be carried just through the skin and then for half an inch parallel to the face of the arm, and the injection made slowly." He advises the arsenic to be diluted one-half with glycerine. He thinks the reason why this method is more successful is that the dose

can be much larger without causing arsenical poisoning. He declares that thirty-five drops can be given every day with impunity, and reports cases which had resisted all other drugs cured in a short time by these large doses, without any unpleasant arsenical symptoms. In acute cases of mild chorea, he says he has cured with three drops of Fowler's solution every other day, hypodermatically. If we fail with arsenic internally, and with other medicines, we should insist on trying this method.

The bromides were at one time very extensively used in chorea, but they have been abandoned on account of the depression they caused. Only one, the bromide of camphor, is still used. In France it is highly valued, especially in women and female children. One remarkable case quoted by Hart was cured by one grain morning and night. I have cured several cases in women who were very emotional, and when chorea was caused by mental shock.

Strychnine should be an excellent remedy in *paralytic chorea* in which the irregular movements are confined to the paralyzed side. If strychnine is indicated for the hemiplegia, it will remove the attendant chorea.

Dr. Delamater cured with phosphate of strychnine a case of general chorea in a boy. He diagnosed the case as caused by anæmia of the antero-lateral column of the spinal cord. Nux and strychnine are indicated in that condition. In a few cases when I did not get favorable results from arsenic, it occurred to me that there might be a paralytic complication. This led me to try the arsenite of strychnine 2x, and the results were all that I anticipated. This preparation has taken a high position as a cerebro-spinal remedy when there is anæmia of the motor column of the cord.

Cuprum is a typical cerebro-spinal remedy. The choreic movements are characteristic. They appear to start in the fingers and toes and spread to the muscles of the limbs. The patients are better when lying down and when asleep, although the sleep is not entirely free from choreic movements; the muscles of the throat are affected, causing dread of suffocation, and difficult deglutition. As taught by Rademacher, under certain circumstances copper appears to enrich the blood, like iron. If your cases of chorea are chlorotic, it is an additional indication for copper. If cuprum fails, try the arsenite

of copper, which in my hands has cured two cases. Tablets of the 1x or 2x; one after meals and at bedtime.

Cimicifuga has enjoyed a very extensive reputation in the treatment of chorea. Where we consider its profound sedative effect on the cerebro-spinal and sympathetic system, also its great value in rheumatism, we can account for that reputation. Any medicine which gains a purely empirical reputation among the aborigines and people of a new country must certainly have some specific virtues. From the earliest period this plant has had among the people and the early "Botanic Physicians" a reputation for the cure of chorea. From them it was taken up by the regular school. It is useful both in "fright chorea" and in many cases of chorea appearing just before or at puberty, in girls. Cimicifuga freely given will bring on the menses, after which the chorea will improve. It will cure chorea in older girls, when it appears only before and during the menses. Cases are on record in which chorea appeared only during pregnancy. Cimicifuga has benefitted many such cases.

If melancholia, sleeplessness, and a wearing pain in the left inframammary region are present, this remedy is specially indicated.

The dictum of Eclectics is, that before curative results appear, the patient must feel the effects of this drug in the head, a sense of tightness and expansive pain, but this is not necessary, although the curative dose of five to ten drops of the tincture, three times a day, often causes slight headaches. The active principle, cimicifugin, sometimes called "macrotin," is quite as efficient and more convenient, for a tablet of the 1x, containing one-tenth of a grain, is equal to five drops of the tincture.

Scutellarin has about the same influence over the motor nervous system as cimicifuga, but it acts more on the gray matter of the brain, and causes exhilaration rather than melancholy. For chorea from overstudy in children, or worry in women with obstinate insomnia, this remedy ought to be useful in the lowest triturations. (Cypripedin is useful in the same conditions.)

Gelsemium is praised by C. L. Gregory, M.D., of Yreka, Cal., in the following article.

"I would like to call the attention of the profession to the use of gelsemium in chorea. I have been using this remedy during the

past six years in these cases, and have yet to record my first failure to cure. I was led to try it in an obstinate case of this disease, which had resisted every remedy exhibited, by reading an article in some medical journal, the name of which is not now remembered, claiming that it would cure chorea. I had tried rest, the milk diet and all the more prominently mentioned drugs, including a six weeks' use of Fowler's solution, without the least benefit, and I was greatly puzzled to decide what to do next. The case was a thirteen-year-old girl; the movements were exceedingly annoying, interfering with rest and nourishment to such an extent that I feared she would not recover. Her heart was much weakened, and she was having a slow fever, tending toward the typhoid type. I put her on five-drop doses of tincture gelsemium every four hours, using it alone. In forty-eight hours there was perceptible improvement, and in ten days she was on the high road to recovery. In one month she seemed as well as ever, and has remained so, with one exception, to the present time. Three years ago she again showed symptoms of chorea, when I promptly placed her on three-drop doses of the gelsemium, and in two weeks she was again well. In her first attack, I gradually reduced the dose to one drop three times a day.

"During the past six years I have treated eighteen cases of chorea with gelsemium alone, and without a failure. Two cases were girls who have since married, and in each instance have had a second and third attack, which was promptly controlled by the gelsemium, when pregnant with the first and second child. One of them has had a fourth and severe attack but recently, which was also cured in less than two weeks by the gelsemium. I do not now insist on rest, diet, etc., but depend wholly on this one remedy. I use a strong tincture made from the green or recently dried root, and I insist that *the preparation must be good.* No muddy fluid extract or tincture made from the dried-out and stale roots will answer the purpose.

"I think it is a remedy well worth extended trial, but my experience with it has been too limited to give more than a hint of its value. Doubtless there are many cases which it will not cure, but I am inclined to think that if a first-class preparation of the green or very recently dried root is used, it will promptly cure a majority of them. I much prefer it to Fowler's solution."

Dr. Hugo Lœwenthal quotes the statement of Dujardin-Beaumetz, that exalgine is not only an anodyne, but also acts upon the cerebro-spinal nervous system, and has a favorable effect upon convulsive conditions.

Lœwenthal has tried it, and reports thirty-five choreic patients treated by him with exalgine during 1891. The doses were three grains three times a day, in some cases increased to five times a day, so that the amount given in a day never exceeded fifteen grains, nor fell below nine grains, except in the case of a three-year-old boy, who was given one and one-half grains three times a day. The powder was administered in sweetened warm water. The patients ranged from three to eighteen years of age. In some cases the chorea was light, in others quite severe. In general the result was satisfactory. Light cases were quickly cured; severe ones required a longer time. The duration of the cure varied from eight days to four months. Two boys who had slight attacks were cured in eight days. The average duration was from five to six weeks.

Improvement was noted in some cases after taking twelve powders, or thirty-six grains; but in most cases it was not until after seventy-five or ninety grains had been taken. The smallest amount given was to an eight-year-old boy, who took thirty-six grains in a week, and was dismissed cured.

Along with the good action of exalgine, unfavorable symptoms were also noted. Ringing in the ears, intoxication, motes before the eyes, vomiting, increase of existing pain, headache, and cyanosis, which had already been noted by Rabow, Heinz, Cahn and Stepp, Gaudineau, Binet, Bokenham, and Jones. The last two also noted one case in which there were symptoms of poisoning. This depends upon the size of the doses and a protracted use of exalgine. Direct symptoms of poisoning Lœwenthal did not see. In every instance, upon the appearance of an unfavorable symptom, he at once suspended the use of exalgine. The small doses given could be continued for months.

The bad results which he himself noted were nausea, once; vomiting, four times; weariness, twice; headache, twice; vertigo, once; vertigo, numbness, and vomiting, once; jaundice, three times.

As far as known, these are the first cases of jaundice following the use of exalgine to be reported. Cyanosis of the lips was noted once.

It must not be inferred from this list of bad results that the beneficial results of exalgine are cast in the shade. On the contrary, the exalgine was satisfactory in the majority of cases, although no specific action in the cure of chorea can be claimed for it. The urine was examined occasionally. Once it had a brown color, tinged with green (this was not a patient with jaundice). Albumin and sugar were not found. The blood was frequently examined under the microscope, but nothing abnormal was found.

Hyoscyamus causes disorders of coördination to a greater extent than any other drug. Body and mind both seem to suffer from irregular and involuntary motor irritability. Many cures of chorea are recorded due to this drug, but none so remarkable as the following, with the alkaloid hyoscyamine.

Da Costa described the following as the worst case of chorea that he had ever seen. The patient was a boy about eleven years old, pale and weakly, and said by his friends to have always been nervous. Four weeks before the date when he was admitted (on the 14th of December) he had an attack of acute rheumatism, which involved all the larger joints of his body. The rheumatism lasted about three weeks, but as it declined choreic symptoms began to be manifested. His hands and arms were first affected, and afterwards his legs. When admitted he was actually unable to walk; he was even unable to feed himself, and seemed in risk of starvation. He was wretchedly weak and emaciated. He could perform no coördinated movements with his arms or legs, and unless there was always somebody about to give him a drink of water or food he would have perished. This was not due to actual want of power in the muscles, but to the impossibility of performing any voluntary act requiring coördinated movements; but when food was placed in his mouth deglutition was readily accomplished. When admitted he could not articulate a word. He could not put out his tongue, although he could open his mouth and move his jaws, but he could not ask for food. His expression was that of an imbecile, and he was reduced to a mere shadow. At first his arms and legs were constantly moving, both sides being equally affected. No power of grasp existed in his hands, though sensation did not seem impaired. He complained of pain when he was pinched. The patella reflex was normal, and not exaggerated. No marked change in the electrical reaction was observed. His pupils

were very much dilated; his pulse was only fifty per minute, and rather weak; there was a systolic mitral murmur heard at the apex. These involuntary muscular movements did not continue at night, when he was asleep. His urine had been examined, but neither albumen nor sugar was detected. His bowels tended to constipation. The ordinary remedies for chorea act slowly; arsenic, though one of the best of our therapeutic agents for this disorder, acts slowly; it takes time, and the loss of time here might be fatal. Dr. Da Costa then recalled a case of tremor which he had seen rapidly influenced by hyoscyamine, the active principle of hyoscyamus niger. He concluded to try it here. He ordered him to take 1-200th of a grain to begin with, a decided dose for a boy of his age; but not finding a marked influence, he concluded that it would be advisable to increase the dose to 1-100th of a grain, given three times a day. Now the effect was admirable. From the first few days the boy began to improve, and at this time he had some dryness of the throat and wanted his mouth frequently moistened. He soon became brighter in his mind; he took more interest in what was going on; he moved voluntarily in bed, and tried to help himself to food. His voice also returned and he left his bed and began walking about the ward. After this his recovery was rapid and uninterrupted. He has had no other treatment than the hyoscyamine, and he has now so much improved, though he is still somewhat pale, that he may be looked upon as having recovered. He can sit quietly; he has power over his hands, both in coördination and in grasp, although his grasp is still a little feeble. His pupils are dilated, though not much. The systolic apex murmur persists—it is a chronic mitral regurgitant murmur. In every other respect the boy is nearly well.

For many years I have used hyoscyamine and hyoscine in mental and nervous disorders. Where they are indicated, their action is greatly superior to the tincture of the crude drug.

Strammonium, owing to its close relationship to hyoscyamus, ought to be useful in chorea, but we have no direct proof of it. Possibly its alkaloid, daturin, may prove effectual. I do not believe that either belladonna or solanum are homeopathic to chorea. Atropin has been recommended for it, but I can find no positive evidence of its value.

In relation to tarantula and mygale, I have serious doubts of

their value, notwithstanding the reports by Drs. Firmont and Goudy of cases cured by the former; and those of Dr. Spooner and Blake of cures by the latter. I have used them both when apparently indicated, but got no good effects. I am equally in doubt about the cure of a severe case of chorea with phosphoric acid reported by Hempel. The symptoms disappeared under its use, but why? Phosphoric acid produces no choreic symptoms. It could not have been homeopathic. But as Hempel gave large doses of the acid it probably acted solely as a tonic to the nerve centres. This leads me to observe that in cases of chorea in poorly nourished children, pale and emaciated, the hypophosphites greatly aid the action of specific remedies. An emulsion of cod liver oil with hypophosphites is almost indispensable when such children will not eat fatty food.

In robust plethoric girls, who often have chorea, there is no drug that equals veratrum viride. Some of the most violent cases have yielded to its influence. The spasmodic movements almost verge on tetanus and opistholonos. The heart's action is very violent and perhaps spasmodic. (Dose, one to five drops every three hours.)

Agaricus muscarius has cured many cases of chorea when accompanied by symptoms of cerebral irritation. A study of the provings will show how close a *similimum* it is to the most bizarre and violent cases.

When we are sure that the disease is caused by worms, after ascertaining if possible the species, we should expel them. For tape worms, use felix mas, naphthaline five grains three times a day, and other remedies mentioned under intestinal parasites. Silica and cina have made cures in such cases when caused by round worms. Santonine 1x is often quite efficient.

In hospitals there have been cases so violent that the main treatment has been to produce constant sleep for many days. In some cases chloral, given in doses of ten to twenty grains every two hours for a week or more, has brought about a cure.

Chloroform, used almost continuously, has been resorted to with alleged good results.

"Dr. Gross, of Regensberg, finds argentum nitricum, 2nd to 4th trituration — probably decimal — more effective in chorea than any of our ordinary remedies, and relates four cases illustrative of its powers (*All.* Hom. Zeit., vol. lxiv., No. 24.)" The cases cured by this drug were probably of spinal origin.

CARDIAC-CHOREA.

This is not a disease of itself, but a state of the heart associated with chorea. I have seen several undoubted cases in which the choreic movements were first observed in the heart. Its movements were spasmodic, irregular, and the palpitation unlike other palpitations. The beats of the heart remind one of jumps, leaps, and other choreic motions. It may be rheumatic, but is probably neurotic in most cases. In other instances it appears during an attack of rheumatism.

It may be caused by worms. In all these varieties, the principal indicated remedies are veratrum album, veratrum viride, and spigelia.

Spigelia has been ignored in chorea, but I am satisfied that it may prove useful in other than cardiac cases. For the symptoms mentioned above I consider spigelia specific (in the 3d or 6th).

Veratrum album and veratrum viride are indicated when the movements are not alone irregular, but rather forcible and spasmodic.

Cactus may prove an excellent remedy. The palpitations caused by it are singularly irregular.

Physostigma is a remedy of great value in these cases, where the action of the heart is exceedingly irregular and tumultuous, the 1x — a tablet every two hours. In some cases the 3x three times a day, and in some cases it has seemed necessary to use from one to three-drop doses from two to four hours apart.

The nutrition of the patient should always be carefully looked after in all cases of chorea.

CHOREA IN PREGNANCY.

Chorea, which is a rare complication of pregnancy, affects primiparæ by preference, particularly those possessing an hereditary predisposition. Barnes was able to collect only fifty-six, and Fehling only twelve additional cases from the whole domain of obstetrical literature.

According to Goodell, the choreic movements are of reflex nature, and are referable to impaired nutrition of the central nervous system,

incident to the hydræmia of pregnancy. The association of chorea and organic cardiac disease has been frequently observed, and the discovery in certain cases of fibrous vegetations upon the mitral and aortic valves accounts for the assumption, by some authors, of embolism as a cause of chorea. Barnes discountenances this view, and calls attention to the probable causative agency of myelitis. Terror and other intense emotions may act as exciting causes of chorea. Choreic movements occurring in pregnancy do not differ from those attending the disease in the unimpregnated state. They are usually bilateral. In most cases the muscular contractions manifest themselves in the earlier months of pregnancy, and continue until delivery is accomplished. In rare instances they are arrested at the beginning of parturition. In still more exceptional cases the contractions may either cease before delivery or persist during the post-partum state. Transitory albuminuria and diabetes mellitus are occasional unexplained complications of chorea gravidarum, and the phosphates and urates of the urine are present in abnormal abundance. Abortion and premature delivery, due to the repeated succussion of the uterus, are of very frequent occurrence.

Chorea exerts a prejudicial influence upon the course of pregnancy, having interrupted it in about one-half of the recorded cases. Death of the mother resulted in seventeen of the fifty-six cases collected by Barnes. The fatal termination was usually referable to the exhaustion consequent upon protracted muscular exertion, or to hemiplegia secondary to grave cerebral or spinal lesions. The life of the child is less frequently sacrificed, but it is itself often affected with chorea.

The following conclusions, arrived at by Dr. Lever twenty years ago, fully represent the present state of our knowledge in respect to most of the points mentioned. "In conclusion," says this writer, "I venture to submit the following propositions: (1) That pregnancy is occasionally associated with chorea or convulsive movements; with paralysis of various parts of the body, of the extremities and of the nerves of special sense; and with mania. (2) That the varying symptoms of such complications may be produced at any period of pregnancy, but when produced, although modified by treatment, are rarely removed during the existence of gravidity. (3) That the patients in whom these complications exist are women of a

highly nervous temperament, of great irritability, or whose constitutional powers have been reduced by some long-continued but serious cause of exhaustion. Lastly: That although in most instances the symptoms will continue so long as pregnancy exists, yet in a majority of cases we are not justified in inducing a premature evacuation of the uterine contents."

Treatment.—The treatment of the chorea of pregnancy requires some remedies not usually used in the non-pregnant. If we take it for granted that the choreic movements are of spinal origin, the chief remedies should be cimicifuga, ignatia, agaricus, cuprum, cuprum arseniosum, and viscum album. I believe cimicifuga to be the most potent remedy. I have cured several cases with the tincture in five-drop doses every four hours, and with macrotin in one-tenth of a grain doses every three hours. It should be continued for weeks before we suspend its use, even if we see no improvement. The mental state indicating it is one of depression and melancholy.

Ignatia is indicated in those choreic movements which resemble chorea but are due to reflex irritation, or have a mental origin, such as fright, hysteria, etc. The mental symptoms are important — the alternation of weeping moods with those of unnatural liveliness and joyousness; the jerking and twitchings do not entirely cease during sleep. (Dose, 3x to 6x.)

Agaricus has been found useful when there are illusions of sight and hearing. Gelsemium is of great value.

Hyoscyamine or hyoscine are specific when in addition to choreic movements there is a general excess of motility, a constant desire to be in motion, especially at night, when there is ungovernable mental and bodily anxiety and restlessness. The dose should begin with one grain of the 3x trituration. If no improvement is observed in a few days give two or three grains — the dose to be repeated every four hours. The maximum dose is the 1-200th of a grain three times a day. Illusions of sight, such as seeing bugs, vermin, or hideous faces when the eyes are closed, horrible dreams with waking in a fright, or morbid jealousy, are special indications. When there is hydræmia, paleness, œdema of the feet, and debility, arseniate of iron, 2x; arsenite of copper, 3x; or the arsenite of potassa, 2x, are invaluable remedies. The dose is one to five grains after meals. Viscum album is especially indicated when with the chorea there are epileptiform

paroxysms similar to uterine epilepsy. In very bad cases, when the movements are violent and convulsive, depriving the patient of rest and sleep day and night, do not hesitate to give ten grains of chloral with ten of bromide of soda every six hours until the patient is quiet. This has been known to prevent miscarriage and premature labor. In milder cases sulfonal, fifteen or twenty grains, given in hot water, will produce a restful sleep of eight or ten hours. Trional — seven to ten grains—will sometimes act favorably. Chloralamid will often act better than chloral. The patient should be kept quiet and free from all annoyance and irritation, and the use of tea, coffee, and beef be forbidden.

EPILEPSY.

Definition.—A disease characterised by paroxysms of more or less frequency and severity, during which consciousness is lost; and which may or may not be marked by slight spasm, or partial or general convulsions; or mental aberrations, or by *all* these circumstances collectively. The essential element of the epileptic paroxysm is loss of consciousness; without that there can be no true epilepsy.

Two varieties of the paroxysm itself are recognized; the *grand mal*, and *petit mal*. In the former there is always violent convulsive action. In the latter, none — but in both there is loss of consciousness, varying from a few seconds to an hour.

Hammond gives five varieties, one of which he calls thalmic, because there are simple hallucinations and loss of consciousness, and he believes the seat of irritation is in the optic thalmus. There is a variety called vaso-motor epilepsy, in which there is an arterial spasm, commencing in the fingers and toes and extending to the brain. It is like vaso-motor angina pectoris. A large proportion of cases of epilepsy belong to this variety.

There is a reflex epilepsy, originating from a wound (traumatic); or from some organ—especially one of the reproductive system—an irritation transmitted to the convulsive centre in the brain.

The "epileptic aura" is not present in all cases, and is so different in its character that an enumeration of the varieties would be difficult.

The causes of epilepsy are legion; nearly every disease of the brain has been found post-mortem, although sometimes no disease of

either brain or cord is perceptible to the naked eye or the microscope.

In these days when specialists control the treatment of all serious diseases of the nervous system, the general practitioner does not have them to deal with, but the milder and obscure forms of epilepsy often come under the physician's care. I can only relate my experience with the latter and give a brief *resumé* of the treatment adopted.

Among the mild forms of *petit mal* are those cases that arise from over-study or mental depression, in which the only symptom is a sudden, transient loss of consciousness, which may occur when talking, reading, walking, or working. There is a sudden cessation of motion, and a staring, vacant look, and whatever is in the hand drops. Many such cases have been cured by phosphoric acid, hyoscyamus, cannabis indica, and agaricus — selected according to the causes, and the similarity of the symptoms. Another form generally occurs in children, and when not hereditary may arise from worms, teething, and other causes remote from the medulla, but transmitting an irritation to it. This variety manifests itself by sudden loss of consciousness with staring, flushed face, rigidity, and (in males) erection of the penis, and passes off with deep sighing and involuntary urination. There may be some twitching and trembling. This form is sometimes caused by contracted and adherent prepuce, and requires dilation or circumcision. If from worms, naphthaline is better than santonine, in doses from one-tenth to two or five grains three times a day. It is one of the most effectual vermifuges we possess. Santonine can be used, but in small doses (not more than one-tenth of a grain), and its effects must be carefully watched, for it has caused epileptic convulsions when given in large doses. If given when worms are supposed to be the cause it often cures the epileptiform seizures, even when worms are not present. The same observation applies to cina, chenopodium, tanacetum, and other worm-medicines. In cases resulting from stomach worms, scale pepsin in capsules, five grain doses from two to four hours apart, has frequently resulted in complete and permanent cure. I have cured several cases of *petit mal* in children with calcarea and silica, when the cause was supposed to be teething or worms. "Night terrors," or "night-mare," in children are epileptiform seizures, and "grinding of the teeth" often

arises from the same cause. In a family under my care two of the children have *petit mal*, one *grand mal*, and one suffered from violent night terrors. This last, after getting some benefit from solanum and hyoscyamus, was apparently cured by the bromide of gold 8x. I once considered the bromide of camphor 1x almost specific, but gold acts very much better in many cases.

Cimicifuga 1x has often cured night attacks of *petit mal*. Cuprum aceticum is also a valuable remedy.

I have had but few cases in which I felt justified in pushing the use of the bromides to the extent of bromism. I was not satisfied with the result. It may be possible, as Hammond asserts, that he "is sure the bromic cachexia is favorable to the eradication of the epileptic tendency." He advises to produce bromism as soon as possible. Few physicians are courageous enough to do this, and few patients will submit to it. The few radical cures obtained by the use of the bromides hardly warrant us to give it to that toxic extent. There is a variety of epileptiform disease termed menstrual epilepsy, in which the bromides, especially the bromide of camphor, is almost specific. The attack has hysterical features, and is often attended with erotism. This latter condition is generally attended with an intolerable itching and irritation of the genital surfaces, clitoris, vulva, and vagina.

Such cases I have cured with bromide of potassium, ten grains every four hours, for three days before the menses; also with ten grains of the 1x and 2x trituration of the bromide of camphor given in the same manner.

Hammond lately praises the bromide of zinc in epilepsy. His formula is: zinc. brom., one drachm; simple syrup, one ounce. Dose, ten to thirty drops three times a day. This should be given largely diluted, as it often causes nausea and vomiting. He says it has succeeded in arresting the paroxysms when other bromides have failed, and that it does not produce bromism, or the cachexia, even when given six months or more. The bromide of strontium may be better than the bromide of zinc, as it causes neither bromism nor any other disagreeable symptoms. This would seem to disprove his assertion that bromism was necessary. I cured one mild case with this bromide of zinc. The paroxysm came on after dinner regularly. Only one-

tenth of a grain was prescribed, repeated before each meal. After a week there were no more attacks.

Oenanthe crocata is probably of all known drugs the most homeopathic to epilepsy. A study of the cases of poisoning, in its pathogenesis, will prove this. My prediction in the last edition of "New Remedies" has been verified in many cases, in which the 3d and 6th has cured violent attacks of *grand mal.*

The bromide of gold has lately attracted wide attention. Dr. Goulard, of Paris, was the first to use it. Ten years' experience with it convinced him that a large number of severe epilepsies may be cured by it. In typical migraine, which is a species of epilepsy, he has found it curative. He gives from one-sixth to one-twelfth of a grain three times a day. This dose will at first cause headache and irritability of temper, but is soon tolerated. I have not yet used it in *grand mal*, but have cured several cases of the mild form with the 3x trituration, two grains three times a day.

Our school claims to have cured epilepsy with belladonna, cuprum, argentum, cannabis indica, and indigo, selected according to the law of similia. *Per contra*, Hammond in his last edition says he has tried belladonna, nitrate of silver, indigo, cotyledon, digitalis, and the salts of copper, without producing the "least good effect,"—but he gives large doses.

Clinical cases of epilepsy cured by rana bufo, from Hering's Hom. Clinic. Dr. Saville was the first who used rana bufo and salamandra with success, not only in epilepsy, but also in paralysis, rabies, and somnambulism. He made his report to the Homeopathic Congress in Bordeaux, in the year 1854. Dr. Andriem and Dr. Tegdet followed his example, and also frequently used this remedy with success in epilepsy. The following short cases are given by Dr. Saville:

"(1) A young man, æt. eighteen, but of such delicate build as to look like fifteen, was afflicted with very frequent epileptic attacks. After bufo in diverse potencies, these attacks ceased and did not recur even after gross excesses.

"(2) P. B., æt. twenty-four, suffered since ten years with epilepsy. The attack of late came on about every two months. After having taken bufo in diverse potencies (from 1 to 6) he had only one slight attack.

"(3) Mrs. C., æt. twenty-eight, married since nine years, mother of three children, of whom the youngest is three months, experienced the first attack of epilepsy two weeks after parturition, eight years ago. The attacks increased in frequency so that she now has two a a week. She is much emaciated, and bears the scar of a burn she received by falling into a fire during an epileptic attack. She received one drop of bufo in eight ounces of water, a teaspoonful every morning, and this was succeeded by the 1st to 6th potencies. The attacks ceased from the first day and did not come back.

"(4) Dr. L. one day came into a village at the moment when several women bore another into a house, she having been seized with an epileptic attack in the street. By permission of the husband I gave her bufo 12, and the attacks failed to come back.

"(5) Mrs. D. had epilepsy for ten years or more. Of late the attacks came on every second day and at the same time. Patient æt. thirty-five, mother of three children; is emaciated and looks miserable. She expected with certainty an attack next morning at 6 o'clock, and wanted to wait the beginning before taking the medicine. Dr. L. gave her a teaspoonful of the remedy at once, and advised her to take another at bedtime, and at five in the morning. Two weeks after, she reported that the expected attack did not occur, that she had taken the medicine regularly, and that she had had no attack since."

In the Transactions of the American Institute, Dr. Holcombe reports seven cases treated by bufo 200, of which three failed to call again because a first amelioration was followed by further attacks.

His fourth case was a woman of sixty, who had suffered from epilepsy since her thirtieth year. The attacks occurred once a week, always at night, and were followed by coma of several hours' duration. After taking bufo 200 no attack occurred for six months, and since then only two or three light ones.

"A woman, æt. thirty, was very much reduced, bodily and mentally, by furious epileptic attacks, which supervened several times a week, which had been treated in vain by many physicians, and which had been pronounced incurable. I prescribed six pellets of bufo 200 once a day. For five succeeding days she was free from attacks, and during that time her persistent headache vanished, and the catamenia, which had ceased for a long time, reappeared; her appetite

was better, as well as the color of her face; she had grown stouter and more vigorous; her mental capacities also had improved. According to last reports she had within one year only one or two light attacks.

N. B.— This patient I never saw; I treated her by letter, but the case seems to have created such an impression that a physician who formerly treated her wrote to me for homeopathic books and medicines, and consulted me about a brain affection with which he himself was afflicted, and two epileptic patients from the same town sought treatment from me.

The other two cases were young men who had been afflicted with epilepsy for several years, and who averaged an attack every month. I commenced treatment by giving each a dose of bufo 200 every day, and one had not had an attack for ten, the other eight months."

Although these reports are insufficient and convey no conviction of the general utility of the remedy, they yet seem to prove that bufo is destined to become of great service in the treatment of epilepsy.

Gratiolet and Cloezer inoculated a sheep, a dog, and a cat with the virus. The symptoms produced were torpor, interrupted by violent convulsions. A dissection disclosed general softening of the spinal matter, and the muscles were devoid of all irritability. Dr. Leydet used bufo also with success in softening of the brain."

Notwithstanding the above report I am still in doubt as to the reality of the cures.

I cannot believe that bufo, tarantula, or lachesis ever cured a case of true epilepsy. Nor do I believe the fabulous stories about the cures made by Boennenghausen with drugs selected with all possible mechanical accuracy, and with a single dose of the 200th never repeated. They may be true notwithstanding my unbelief, but I fail to see how a drug can cure that has not in its pathogenesis a *similimum* of the epileptic spasm.

There is one method which is worthy of attention, first used to modify the paroxysm, but lately as a curative agent—the inhalation of amyl nitrite on the appearance of any premonitory symptom, or the aura. It will positively arrest violent paroxysms if used in time, and greatly modify their recurrence.

Glonoine (nitro-glycerine) has been of more value as a curative

agent, especially in vaso-motor epilepsy. If a tablet, or disc, of 1-100th or 1-200th of a grain be placed on the tongue as soon as the fingers begin to get cold (the cold aura) it has time to arrest the progress of the vaso-motor spasm before it reaches the brain. It has lately been prescribed to be given regularly three or four times a day when the paroxysms were frequent—keeping the arteries relaxed nearly all the time, and has actually cured many bad cases. If its effects did not soon pass off — they last only two hours — the result would be better.

The nitrite of sodium acts longer (one or two grains every six hours), and the cobalto-nitrite of potassium still longer. This last is given in doses of one-tenth to one-fourth of a grain three times a day.

Somnambulism is a species of epilepsy. During the attack there is a state of unconsciousness. Any act the person may perform in that state is an unconscious act, even if the act is murder. I have had several curious cases. One in particular, a woman of middle age who, at irregular periods of a week or two, would spring out of bed in the night, and rush around the room, or go to a window and try to open it. No treatment has been of any avail, although hyoscyamus, strammonium, and gold have been faithfully tried. Another, a little girl five years old, who would spring suddenly out of bed and attempt to get out of the room. After other remedies were futile, she was cured by the bromide of gold, 3x.

Epileptic delirium and insanity is a "fashion" just now, and is taken advantage of by criminal lawyers to clear their clients from the penalty of murder, manslaughter, or any other crime. That such a condition does exist is the opinion of all alienists.

Trosseau uses the following language: "It may be said, almost without fear of making a mistake, that if a man suddenly commits a murder, without any previous intellectual disturbance, without having up to that time shown any symptoms of insanity, and if not under the influence of passion or alcohol or any other poisonous substance, it may be said that the man is afflicted with epilepsy, and that he has had a fit, or an attack of epileptic vertigo." Trosseau should have omitted the word "passion," for a fit of passion may bring on an attack of epileptic insanity or fury. Persons subject to such attacks should be consigned to a lunatic asylum, instead of being turned loose upon the public.

Women are especially subject to attacks which may be called hysterico-epilepsy. One such case I cured with hyoscine; she was apparently in perfect physical health. Her husband informed me they had been married a year and had been very happy until a few weeks before I saw her, when she became irritable and suspicious at times. For weeks she would appear perfectly natural, happy, and amiable, then suddenly she would have suspicions that certain persons were conspiring to alienate the affections of her husband. She had no doubt of his fidelity or affection for her. If she saw with him any of the persons she suspected, she would become enraged to such an extent that she was a fury, and would bite, scratch, and attack her husband with violence, and use the most abusive language. After the attack she had no remembrance of her actions, which were always followed by hysterical weeping and stupor. Her uncle was an epileptic, and in an asylum, and her sister had hysterico-epilepsy. I prescribed 1-500th of a grain of hydrobromate of hyoscine four times a day. She had but one more attack, and informed me a month afterwards that all her delusions had vanished. If she had killed her husband in one of those attacks she should have been held irresponsible.

HYSTERIA.

It is impossible to define this protean nervous disorder. The old name is misleading, as it is not a disease emanating alone from the womb or the sexual organs, for men are the victims of it, as well as infants and children before puberty. Hammond's observation is that "hysteria essentially consists in the predominance of the emotions over the intellect, and especially over the will."

It can imitate almost every disease named in our vocabulary, even some organic diseases. To attempt the treatment based on its symptoms of the mind or body is usually futile. We should seek to find the cause. In women most cases do arise from some fault in the genital organs or functions, but often the most searching examination of all the organs fails to find the slightest deviation from a healthy standard. A girl or young woman may have hysteria in an aggravated form all her life until she marries, when it manifests itself no more; but if she has no children, it reappears after a few

years, or when she becomes a widow. In such cases it would seem to depend on unsatisfied physiological demands. But some women who are very prolific have hysteria all their lives, even after the climacteric.

I believe the real seat of hysteria is in the brain. It may be a diathesis, latent, perhaps, until aroused by some psychical cause, or some local disease. Many of the domestic animals have hysteria, especially mares. Balkiness is a kind of hysteria.

The treatment of hysteria requires the highest diagnostic acumen combined with consummate tact. The physician who depends upon medicines alone will have poor success. He must first gain the confidence of his patient. She must believe that he knows exactly what is the matter with her, and that he can cure her. If the physician acts hesitatingly, or seems in doubt, he can do nothing. Most hysterical patients are conscious of what is said and done around them. Consequently what the physician says when the woman seems unconscious should be carefully weighed.

We can take advantage of this, and by allowing the patient to suppose we think her unconscious we can say things that may greatly assist in her cure. In one particularly intractable case, where I suspected the woman was playing on her husband's sympathies too much, I said to him, during one of her paroxysms, that "if this thing continues much longer we shall have to send her to an asylum." After that she had but one or two slight paroxysms, and doubtless pondered seriously on the matter, for she was soon restored to her usual health.

Some women have such a morbid craving for sympathy that they actually invite hysterical attacks in order to gain by it. Physicians should be very cautious about showing more than professional sympathy. Dr. Oliver Wendell Holmes, in one of his novels ("The Guardian Angel"), gives a very happy illustration of this. Nor should the nurses and attendants show too much sympathy. I doubt if women in hysterics suffer any actual pain. Nor do I believe there is much if any danger of injury from their violent contortions. If possible, I insist that the patient be let alone, for I am sure that restraining her movements aggravates the paroxysms. I have never yet known a patient to be injured if let alone. I believe nearly all hysterics while in a paroxysm would do better if placed upon the

floor of a room and left alone, with the impression that they are to remain alone, until they recover. Often when I have ordered this to be done, the woman came out of the paroxysm before there was time to carry the order into effect. I have known a prolonged paroxysm to be arrested by the arrival of a telegram, or by the sudden illness of one of her children. I knew a young lady who went into the most violent hysterical convulsions I ever saw, recover directly on the arrival of her lover, whom she feared was unfaithful. Another married woman recovered quickly after many days of convulsion, when she thought she saw her husband flirting with her cousin.

M. Charcot gives a remarkable case of a woman who had been in the hospital for four years with hysterical contractions of the flexons of the feet and tetanic stiffness of the legs. For some insubordination he threatened to send her away from the hospital. The next morning the contractions had all disappeared.

During the paroxysms I have found ether and chloroform given freely to be the best treatment. Repeat the anæsthesia again and again until the patient remains quiet. Chloroform never injured a woman in hysterics. For mild attacks they can be given internally, of ether a teaspoonful, of chloroform five drops in a spoonful of water. In some intractable cases I have injected hyoscine — one one-hundredth of a grain, with surprisingly good results.

In my country practice I had an eclectic colleague who relied altogether on lobelia. He gave a full emetic dose, and I have known a paroxysm cease for good as soon as vomiting and relaxation set in. I once gave apomorphine for the same purpose, one-eighth of a grain, with the same result.

The influence of diversion is a great factor in such cases. The old nurse's practice of burning feathers under the nose of hysterics was a good one. It acted as does the placing of mud or filth in the mouth of a balky horse. Dashing water in the face sometimes arrests a paroxysm, but the effect is not sustained enough. In prisons they place the women under a prolonged shower-bath, which always puts an end to the paroxysm. The inhalation of amyl nitrite is often efficient.

The medicines recommended for the cure of hysteria are legion and but few of them are of any value.

The medicines selected for the radical treatment of the status

hystericus must be those that are capable of causing a similar status with similar symptoms. There are certain drugs that may be called hysterical drugs. Gurnsey (Obstetrics) recommends and gives presumed indications for forty medicines. Of these only ten are of real value. The others have symptoms like hysteria, but cannot cause the status. The true hysteria remedies are asafœtida, aurum, cocculus, coffea, cajuput, camphor and bromide of camphor, castoreum, cypripedium, hyoscyamus, ignatia, moschus, nux-moschata, platina, scutellaria, valerian, sumbul, simplocarpus, and zinc.

I will mention only those which I have found useful, and leave the reader to study the others.

Asafœtida is one of the most useful, when given for weeks and often for months. It appears to remove the exaggerated sensibility of the nervous system, acting principally on the great sympathetic. It is most applicable to women of robust physique, full-blooded, passionate, going to extremes of emotions of joy and melancholy, with tendency to local congestions. The convulsions are almost epileptic, and often similar to apoplexy. I give one or two grains before each meal The eminent Dr. Goodell, of Philadelphia, gives a pill of which asafœtida is the chief ingredient. It has a great reputation with the old school. In each pill is — ext. sumbul, one grain; asafœtida, two grains; sulphate of iron, one grain; arsenious acid, one-fortieth of a grain. One pill after each meal. This combination will shock many of our school, but its powerful tonic properties cannot be denied.

Dunham with a master-hand gives a differential diagnosis between asafœtida and platina. They are quite antagonistic in their symptoms, platina being useful for spare, pale, thin-blooded women, who are melancholy, with profuse menses, and of violent passions. I have always been disappointed in platina. It has never cured hysteria when apparently indicated, although I have given it in the 3d, 6th, and 30th.

Aurum has given me better results. It is more like asafœtida than like platina. The chief indications are the exhilaration, followed by suicidal melancholy; the ovarian irritation; the scanty or very profuse menses; the desire for alcohol, and the great irritability of mind and body.

The bromides are always given by the old school, and often their

good effects are undeniable. The newly-discovered bromide of strontium, which is declared quite innocuous, should be tried, as it does not cause bromism. Hammond prefers the mono-bromide of camphor. In several cases it has acted very satisfactorily. I have not given the large doses recommended, finding the 1x or 2x quite strong enough, if given every hour or three times a day, as the case demands.

Castoreum is rarely used, but in my early practice it cured two bad cases for me. Its provings show it to have many hysterical symptoms. Jorg declares it inert, and that on healthy persons it had no effect. But our provings show otherwise. Richter says that even in small doses it cures true hysteria, *i. e.*, from uterine irritation. He advises small doses; I used the 3d trituration.

Cocculus is useful in some cases of hysterical vomiting, when there is present its peculiar dyspnœa.

Hammond and Pavit claim to have cured obstinate hysterical vomiting with the valerianate of caffeine. I have never used it, but I have arrested such vomiting, and the vomiting of pregnancy with hysterical symptoms with cocaine, one-twentieth of a grain every hour.

Moschus is only useful, like camphor, in hysterical collapse, with spasm of the larynx. Glonoine and amyl have a quicker and better effect, in vaso-motor complications.

I have sometimes seen good effects from valerian in the paroxysm; and from viburnum, when it occurred from dysmenorrhœa. One case of hysterical headache or violent hemicrania, always ending in hysterical spasms, was cured with valerianate of zinc, one grain (in pills), three times a day.

Ignatia is a splendid remedy in purely emotional cases with severe gastric troubles, globus, and cardiac weakness. The "sinking sensation in the epigastrium" is a leading indication.

Cimicifuga is an analogous remedy when, in addition to this symptom of ignatia, it has that peculiar infra-mammary pain which is so persistent in some women.

Cyprepedium, scutellaria, and passiflora are of great benefit in the intense nervousness and insomnia.

Sumbul, a vegetable musk, is highly esteemed by Dr. Goodell and Russian physicians. Give a granule of one-tenth of a grain, to be repeated every hour, in hysterical palpitation, cough, and asthma. Finally, do not forget to examine for uterine or ovarian troubles, and

treat them, before you use medicines for the transitory symptoms.

Hysterical pseudo-disease of the joints is often mistaken for rheumatism or hip disease. These joints have been treated for months as a rheumatic affection, baffling the best efforts of the physician, when the disease was all the time a pure hysterico-neurosis. Bramwell on Diseases of the Joints gives the best and most complete description of this strange disease. He reports curing one case of hysterical knee-joint disease by giving his opinion that excision of the joint was necessary. The patient was placed under ether and an incision several inches long was made on each side of the joint, only through the skin, which was sewed up. On regaining consciousness she was told that excision was not found necessary, but that she would be well as soon as the cuts were healed, which prediction proved true.

These are the cases, termed chronic rheumatism with paralysis or deformity, that have been cured by prayer, by "Christian science," the "laying on of hands," and many other irregular methods, having as their basis the power of suggestion or faith.

NEURASTHENIA (Nervous Exhaustion).

Definition.—The term neurasthenia is of Greek derivation, and literally interpreted means lack of nerve strength.

The popular idea of neurasthenia is just the opposite. It is supposed to be synonymous with nervousness, which is not lack of nerve strength as a whole, but rather nerve force irregularly distributed, or in a state of irritation. Neurasthenia is a low-tension condition. Nervousness is a high-tension of the nerve cells. In nervousness the nerve cells have not been exhausted, they are in a condition of functional irritation.

I do not intend to imply that we can always draw the line between the two conditions, for it is often impossible.

I make this distinction for humane considerations. The ignorant public has been very cruel towards neurasthenics. Not only this, but members of the same family, a loving wife or husband, are often cruel as the grave. If they knew how cruel they were, they would be stricken with inconsolable remorse. In my early practice, before

physicians knew anything about the real nature of this malady, they too were cruel. Now there is no excuse for it, either in physicians or the people.

I have known business men, who, while struggling for a competence, after years of overwork by day and night, found their mental and nervous energy begin to fail. Still they worked on, until night after night of sleeplessness, and confusion of mind by day, compelled them to relinquish a work that they could not accomplish without utter prostration. Such men often retain their appetite, their color, and a generally good appearance.

The family doctor would be called in and would call it "malaria," or "general debility," and prescribe a routine tonic, and tell the patient and wife that "he will be around soon," and advise him to keep at work. I need hardly follow the history of such a case, but after a time the doctor would fall back on the diagnosis of "nervousness." The wife would become discouraged, fretful, and unsympathizing, and in the end cruel with taunts and sneers.

If we turn the picture, we find the same thing occuring to a woman worn out with family cares, rapid childbearing, and, in addition, the demands of society, church, and charitable work. The ignorant physicians call it hysteria, or nervousness, and the whole crowd of relations and acquaintances take up the cry. They say she has whims, vapors, or that she is lazy.

Depend upon it, the neurasthenic a quarter century ago had a hard time of it. If poor, the cruelty and indifference was appalling. If rich, they could worry along better, but their lot was not enviable, for they were sent from one climate to another, from one physician to another, and kept in perpetual unrest. *Rest*, the very thing both classes ought to have had, was denied them. The most lamentable result was that many neurasthenics of all classes and of both sexes, driven in desperation to the use of opiates and stimulants, were lost beyond redemption.

I well remember what a great light broke in upon my mind when I read that immortal work of the lamented Dr. George M. Beard on "Nervous Exhaustion." With a master-hand he rent the clouds of ignorance and stupidity, and showed the medical profession the real nature of this disease. It is true that a few physicians had seen glimpses of the truth, but they were not bold or acute enough to dis-

cover its real nature. I advise every physician to read and study Dr. Beard's works on "Nervous Exhaustion," "Sexual Neurasthenia," and "American Nervousness." In his first essay he uses the general term neurasthenia to cover all forms and types of nervous exhaustion; the symptoms coming from the brain and from the spinal cord being described together and indiscriminately. In his later works he individualizes and describes the various forms.

The disease is now divided into several forms. There is *Cerebrasthenia*, or brain exhaustion; *Myelasthenia*, or spinal exhaustion, etc.

In my work on "Diseases of the Heart," I described *Cardiasthenia*, which I believe to be a localized form of neurasthenia.

I shall not attempt to give the causes or all the symptoms of this malady, referring my readers to the works of Dr. Beard; but I will enumerate those most salient and noticeable, and give them without his explanations.

Tenderness of the Scalp (cerebral irritation).—This is to the head what spinal irritation is to the spine. As in spinal irritation, the head is not tender all over, but only in spots. This tenderness generally occupies the ramifications of the occipital nerves, and is often mistaken for cervico-occipital neuralgia.

Dilated Pupils, or abnormal activity of the pupils, or unequal size of the pupils.

Sick Headache and pain, generally a pressure, heaviness, or burning on the vertex.

Changes in the Expression of the Eyes, at one time dull and expressionless, then unusually bright. Congestion of the conjunctiva is a common symptom.

Ocular Neurasthenia is very common and is the plague of oculists. I have patients with neurasthenic asthenopia who have had their spectacles changed a dozen times a year. No sooner is one condition of the muscles corrected than another morbid condition takes its place.

Auditory Illusions, such as ringing, whizzing, roaring, explosions, etc., annoy the patient, although the aurist cannot find a single objective symptom in the ears. Sometimes the voice changes; taste becomes abnormal, but the most annoying symptom is deficient mental control, and it is generally allied to mental irritability.

Hopelessness is a common symptom, so is also *morbid fear*, fear of every thing or of only one trivial thing. Fear of being alone I have oftener observed than any other. Almost as common is a fear of something indefinable, they cannot say what, but it is generally of "something dreadful going to happen."

Nervous Dyspepsia is a most distressing and uncontrollable symptom. Desire for stimulants and narcotics. Tenderness of the spine. (I have described under spinal anæmia the condition called myelasthenia by Beard.) The tendency to *Hay Fever* is claimed to be a condition common in this disease. There is one characteristic of neurasthenics, mentioned by Beard, which has been observed by thousands since he called attention to it, the "*appearance of youth.*" In other words, patients look much younger than they are. This is a good diagnostic symptom, for nearly all other diseases cause an opposite appearance. Another curious fact is that neurasthenia may affect *one-half of the body only.*

The chief fault found with Beard's work when it first appeared was that he enumerated among the symptoms of neurasthenia those of nearly all diseases of the brain and nervous system. This is true, and the reason is that this disease, like hysteria, will imitate all forms of nervous disease and others not nervous. It will imitate closely many of the diseases of the reproductive system, even the structural, but when you examine the patient, touch or sight fails to discover any objective symptom.

The accurate diagnosis of neurasthenia requires all the acuteness, good judgment, and reasoning powers that an intelligent and well-educated physician can bring to his aid. His responsibility is very great. His patience and sympathy will be demanded, and should be abundant. It must be carefully diagnosed from inflammatory conditions of the brain and cord; from tubercular affections of the same organs; from hysteria and malingering, and from what a recent writer, Dr. Myrtle, calls "False Neurasthenia."

Dr. Myrtle writes as follows upon this subject: "We may find symptoms in every respect similar to those of true neurasthenia, and it will take you all your time and patience, as well as tact, to detect the sham from the real. If you hark back a bit, you will find that as a child she showed temper; as she grew, she became fitful, hysterical, and given to the sulks; craved for sympathy, and exhibited little

or no sympathy for others. On questioning her, she describes her sufferings in forcible language. She can neither eat or sleep; has not an atom of strength; suffers from the most dreadful pain, most fearful headaches, and frightful spasms; and should you suggest any portion of her body, from her head to her heels, as possibly exempt from pain, she often resents the insinuation, and declares that is the very part where she suffers most. While she tells you all this in a sort of a whine, her features don't show indications of any agony, and, if you watch her, you will find that she overacts her part. Utterly indifferent to the anxiety of parents and friends, or to the trouble and expense she causes, she seemingly finds gratification in watching the unwearied efforts of those around her in doing their best to comfort and help her. While putting on an air of the most abject listlessness while you look at or speak to her, if you talk at her you will find she has both eyes and ears; if you assist her in any way she makes herself as helpless as she can — a dead weight. These creatures not only deceive everyone around them, but in time succeed in deceiving themselves. Were it not so I cannot understand how they continue playing such a sorry game for so long, and with so much strain and fixity of attention, to the exclusion of everything else, as I have seen them do. If we push our inquiries a little further, we generally discover that there is some obliquity of the moral sense; an ungratified whim or disappointed affection at the bottom."

Treatment.—Dr. Beard remarks: "Each case of neurasthenia is a study in itself. No two cases are alike in all details. If two cases are treated precisely alike from beginning to end it is probable that one of them is treated wrong." This reads like a paragraph out of the Organon of Hahnemann. What is true of neurasthenia is true of nearly every disease, for neither are the symptomatology nor pathology alike in any one disease.

In neurasthenia, as in all other diseases, the totality of the symptoms must be the one guide to the selection of the medicines used. This assertion, however, is subject to one qualification. We must not select a medicine that has no affinity *for the nervous system.*

Nearly all the so-called antipsorics in our Materia Medica, by the multiplicity of their symptoms will cover all the symptoms of neurasthenia, but this fact does not make them curative remedies for neurasthenia. The fact is, that but *few* of the antipsorics are really

remedies for neurasthenia. The seat of the multiform disease called by the general term neurasthenia is in the brain and spinal cord, and a medicine capable of curing it must be one which has a specific action on those great nerve centres.

The aphorisms enunciated by Dr. Beard are as applicable to one school as to another. He says: (1) "The treatment should be constitutional, with special attention to local manifestations whenever they become severe. To devote the whole attention to special or local manifestations: as spinal, or cerebral irritation; cerebral hyperæmia; asthenopia; oxaluria, insomnia, or nervous dyspepsia, is unphilosophical and will never be successful."

(2) "Dependence should be placed not on any one exclusive mode of treatment, but rather on a combination of various methods, local and general."

(3) "The treatment should be occasionally changed, according to the needs of the patient."

"It is not possible," he says, "to set the rudder so that the ship may steer straight across the Atlantic; it must be watched each moment, and shifted with the winds and currents. It is equally impossible, by a single prescription, to steer a neurasthenic sufferer over the long voyage to health. Individual idiosyncrasies must be religiously respected, and when we find that a patient cannot bear one remedy or mode of treatment, we can fall back on other remedies." (Beard's Nervous Exhaustion, p. 133.)

He makes one very important suggestion, that at times treatment should be entirely withdrawn. We have all heard a patient say, "Your medicine had no good effect while I was taking it, but after I stopped it I began to improve." This does not imply, as patients believe, that this medicine was of no value, rather the contrary. It shows that the remedy was the right one. Hahnemann observed the same results, and therefore he often advises us not to interfere with this improvement, and not to repeat the medicine until the improvement ceases.

When I have selected the radical or constitutional remedy, I order it taken continuously for a week or two; if, during that time, the patient observes decided improvement, it is taken at longer intervals, or in smaller doses.

If no improvement sets in within a reasonable time, stop the

medicine altogether. Then improvement will be observed, and this improvement should not be interfered with.

The following are the constitutional remedies which may be indicated in the treatment of neurasthenia:

Absinthum, aconite, agaricus, alstonia, anacardium, argentum, arsenicum, asafœtida, aurum, baryta, cannabis indica, coccrlus, cuprum, cimicifuga, convallaria, digitalis, ergot, lycopodium, ignatia, nux vomica, phosphorus, phosphoric acid, picric acid, picidia, pulsatilla, sabadilla, sepia, silicea, stannum, strychnine, tellurium, viscum, and zinc. We do not yet appreciate the value of compound remedies. It is a mistake to suppose that they must be proven before we can use them. The symptoms of both remedies indicate the compound of the two. Thus the arseniate of gold is indicated when the patient has many of the symptoms of both, and neither drug has them all. It may be asked, why not follow Hahnemann's advice, and give one until the symptoms indicating it disappear, and then give the other if *its* symptoms remain. I reply, that it is a waste of what might be valuable time. Then why not alternate them? I again reply, that time might be wasted, for we do not get the united force of both at the same time. A simple illustration will explain my meaning. If two men are set at work to lift a heavy weight, should they alternate in their efforts? Both would not accomplish more than one. But if they lift together, they exert the power of two. As a fact, I have often observed more and prompter curative or physiological force from two remedies given in combination than when given separately.

The following are some of the compound medicines likely to be useful: Arseniate of gold, arsenite of quinine, and arsenite of strychnine; also the arseniates of copper and iron, and the picrate and phosphide of zinc, hypophosphite of lime, bromide of gold, and bromide of nickel.

I have been quite successful with the arsenite of strychnine, the bromide of gold, and the phosphide and picrate of zinc. They cover a vast array of symptoms, and reach the radical cause of neurasthenia. The palliatives oftenest of use for the various local manifestations are so many that they cannot all be enumerated. The most important are aconite, belladonna, coffea, coca, epiphegus,

bromides of sodium and strontium, asafœtida, scutellaria, valerian, sumbul, glonoine, kola, phenacetin, piper meth., pauliana, etc.*

Medical treatment alone will not accomplish much, unless combined with hygiene. We must correct abnormal habits; prohibit or advise mental and physical exercise or labor; advise travel or isolation, as seems indicated for the patient. The diet is important. Not enough fatty food is taken by neurasthenics who generally are averse to it, but it can be so disguised as to be palatable. It is the greasy appearance and taste which they dislike.

Sugar and starch are to be avoided as much as possible. I am inclined to the opinion, that, except in rare cases, *red* meats of all kinds are not suitable. Beef, I am sure, does not agree. A vegetable diet combined with plenty of bacon, butter, salad oil, cocoa, nuts, etc., the use of the albuminous and gluten of cereals, and milk or matzoon, is the ideal diet for nervous prostration.

Rest is one of the most important means of recovery in the majority of cases; rest for the portion of the nervous system principally affected. Those faculties of the brain that have been strained and have become exhausted, should be made to rest. This does not mean that the whole brain should be compelled to rest. The brain cells, exhausted by the cares of financial excitement, should rest; but others, like those which preside over music, the sports of hunting and fishing, or historical study, can be exercised.

When the whole cerebrum has been exhausted by multifarious mental labors, the patient should be advised to resort to physical labor — gradually, at first, until the long unused muscles are accustomed to exercise. In rare cases it is absolutely necessary, in women especially, to isolate them entirely from friends and relations. Dr. Weir Mitchell has gained a world-wide reputation for his success by this method. He claims that it is impossible to cure a neurasthenic, especially if hysterical, unless she be isolated. It is not necessary that she should be shut up with a stupid and disagreeable nurse, for many of the trained nurses of to-day are intelligent thoughtful women, and are as patient and sympathetic as is necessary. Friends and relatives are either too sympathetic or too indifferent and irritating.

* For the indications of many of the above remedies, refer to the articles on Cerebral and Spinal Anæmia and Hyperæmia.

No correspondence except on business matters should be allowed. Letters are often an exasperating source of annoyance. The patient can be read to, and interested in things that do not excite or irritate her. In the pleasant, quiet suburbs of every city there should be a Hotel or Retreat for nervous or nerveless patients. Then, when a man or woman felt an imperative need of quiet and nerve repose, they could go there for a few days or weeks. It would be much better for them than to resort to drugs. I need not advise the judicious use of electricity and massage, because these powerful agents are so commonly adopted by all schools. Nor need I mention the value of "suggestion," by which Charcot cured so many recent cases of all kinds of nervous disorder. In skilled and conscientious hands hypnotism may be of great value.

Travel as a remedy for neurasthenia has been advised in cases where it is decidedly contra-indicated. In spinal neurasthenia patients are very liable to be made much worse by travel; the fatigue, discomfort, and sight-seeing injure them. They are far better off at home. The spinal cord wants rest. Nor should horseback riding be advised, it aggravates. In the beginning of brain exhaustion, travel, by diverting the mind and bringing new faculties into use, may be of benefit.

Climate has a large influence over neurasthenia, both good and bad. A change of climate should be advised with caution. My observations have convinced me that neurasthenia is a disease of the temperate zones. The further south we go, the less we shall find of it. Americans in New Orleans suffer less from it than in New York, Chicago, or Boston. It is less often found in low, humid regions than at high altitudes. For this reason never send neurasthenics to Colorado, California, or any region of high altitude — over 1,000 feet above the level of the sea. The best place in the United States for such patients is the middle third division of Florida, *i. e.*, from a line along 29° to 26° of latitude, or that belt lying between Enterprise, on the north, to Charlotte Harbor, on the south, in which lie such places as Winter Park, Enterprise, Orlando, Tampa, Rock Ledge, Lake Worth, and especially Pine Island with its quiet hotel, its facilities for fishing, boating, and its delicious climate from December 1st to April 1st. Ft. Myers, on the main land, also Naples, the most southern location attainable this side of Key West, are

excellent spots. Next to these are the Barbadoes, Cuba, Nassau, and Jamica.

Never advise a patient with neurasthenia to go to Europe without a definite purpose. If the case is severe enough, and "money no object," send him to Dr. Charcot* of Paris, who will give him some kind of a shock, in the way of unique treatment, or send him to some quiet water-cure in Germany. There are cases of cerebrasthena that are cured only by a long sea-voyage on a sailing vessel. I recall two cases where this condition resisted all treatment, but a voyage "round the Horn" to California cured them. One, an Englishman, informed me he had made three such voyages at intervals of five years, each voyage occupying about six months. On his return to London each time he was perfectly restored.

A winter residence in the pineries of Michigan or Wisconsin has cured many cases. I sent a clergyman to the Island of Mackinaw for the winter. He returned cured. Not only a change of climate, of location, but a change of business is sometimes necessary.

(As I write this I find in a recent journal an account of the treatment of neurasthenia by the injection of a glycerole extract of sheep's brains. The results are said to be better than from any other treatment. This is an old idea in medicine, renewed by Brown-Sequard. The Scandinavian hunter eats the lungs of wolves for dyspnœa; the Romans ate the testicles of animals noted for their virility, to restore failing virility. There seems to be some basis of truth in that ancient belief. Dr. Hammond uses successfully injections of Cerebrin. It can be given on the tongue, in the 1x or 2x dilution.)

INSOMNIA.

Definition. — Insomnia does not mean sleeplessness from all causes. When the inability to sleep arises from pain, or definite physical discomfort, it cannot properly be called insomnia. I consider true insomnia to be an abnormal state of the brain and nervous system, without pain, which prevents normal sleep.

"Normal sleep may be defined in general terms as that state of the central nervous system in which the higher centres are to a great extent in a state of physiological quiescence, with all the consequences thereby implied. In its most profound form, and probably in its

* Since the above was written, Dr. Charcot has died; an irreparable loss to the world at large.

most perfect manifestation, there is a total cessation of the strictly psychical functions. The automatic and reflex centres, on the contrary, are active, so that the functions dependent thereon, such as respiration, circulation, digestion, secretion, etc., are regularly carried on. (Dr. J. L. Corning, "Physiology and Pathology of Sleep.")

The experiments of Hammond, Fleming, Durham, and Corning prove beyond question that the degree of sanguineous irrigation of the encephalon is in direct proportion to the amount of functional activity of that organ. When the activity of the brain is greatest the hyperemia of the meninges obtains a maximum degree of intensity; whereas, during the functional quiescence of sleep, the amount of blood circulating in the vessels of the pia mater is at a minimum. Corning divides insomnia into *idiopathic* and *symtomatic*. The former is a sleeplessness, the predisposing causes of which cannot be traced to any particular source extraneous to the brain itself. The latter to that form of the disorder which may be observed in the course of many acute and chronic diseases. This definition is too broad for consideration in this article, for it would include fevers and pain.

The causes of sleeplessness aside from pain or discomfort are too many to enumerate. An exaggeration of any mental emotion may cause it; sorrow, jealousy, fear, disappointed ambition, suspicion, sudden pecuniary loss, excessive joy, or pleasant anticipation, all may cause sleeplessness.

Besides these there are causes which defy the acumen of the patient and physician to discover. Many men and women, who seem in perfect physical and mental health, with not a known cause for mental anxiety, will complain of continued inability to sleep the whole or part of a night. They may go to sleep when they go to bed, and sleep till two o'clock A. M., and then lie awake until day; or they may toss about till after midnight, and then fall asleep, waking at the usual hour, unrefreshed. This form of insomnia should be very carefully investigated, for it may mean that some insidious brain trouble is impending.

When insomnia depends on mental causes it will, unless checked, result in permanent impairment of the brain and some form of insanity. When sleep does occur in such patients, it is not normal. It is attended by dreams of a vivid, disagreeable, or painful charac-

ter. Patients have often said to me, "Such sleep as I get is worse than none." All the cares, anxieties, and grief of the waking hours are carried into the domain of abnormal sleep. It must not be forgotten that a patient may experience all the mental emotions mentioned as causes of insomnia, without having any real cause for such emotions. Fear, joy, grief, apprehension, and jealousy may be illusory manifestations of a disordered mind and brain; but these hallucinations are just as much causes of insomnia as if the emotions were based on actual occurrences.

Sleepless nights often occur while one is in seeming health, just before the onset of a febrile attack, particularly before a malarial paroxysm. Certain conditions of the atmosphere cause sleeplessness in impressible persons, but we have been so far unable to classify and explain its method of action.

Physical weariness without actual pain causes insomnia. The expression "too tired to sleep" is a common one. Some of the toxic constituents of the urine if retained in the blood cause an uncontrollable sleeplessness, which will persist until the kidneys excrete them. In such cases our remedies should be directed to those organs instead of to the brain. Remedies which increase the excretion of urea will cure the insomnia. If morphine or any preparation of opium is given for such a condition, serious results may follow, for opium prevents the excretion of urea. Retention in the blood of some of the toxic bile constituents causes obstinate insomnia, and requires hepatic remedies.

Treatment.—The whole medicinal treatment of insomnia by the "regular" school is based on pathological data. They contend that as the brain during sleep is anæmic, and during insomnia hyperæmic, therefore drugs must be given to cause cerebral anæmia. The theory is plausible, but the fact is that antipathic drugs never cure a chronic insomnia. They palliate, and as palliatives are useful in acute cases, I admit that in insomnia due to transient causes, they may, by causing sleep, prevent the habit from gaining a foothold, and thus ward off injurious results to the brain.

Homeopathists are equally in error if they suppose that in all cases they can cure insomnia due to mental and nervous causes by giving remedies which cause sleeplessness by their primary action.

There are cases where it is imperatively necessary to the welfare

of the patient that we should cause artificial drug-sleep — a sleep produced by a physiological effect on the brain or its blood-vessels. It is often as important as to put an injured limb in splints.

Hypnotics, when properly chosen, restrain the blood from flowing to the brain, and inhibit temporarily the morbid activity of the cerebral cells. While this sedative action in the cells exists, they are having a physiological rest and are more likely to recover their normal tone. I do not wish to be understood as underrating homeopathic remedies. I know their value too well to discard them, and I have seen their beneficent action in many cases where antipathic drugs had to be abandoned as injurious and useless.

The drugs which are homeopathic to sleeplessness from cerebral hyperæmia include all the cerebral stimulants. The most important are opium, aurum, belladonna, agaricus, hyoscyamus, stramonium, lachnanthes, solanum, coca, cannabis indica, coffea, tea, ilex cassine, ilex paraguayensis, etc. The primary effect of all these when taken in small quantities is to increase the amount of blood-supply of the brain, causing wakefulness. It is only when large doses are given that sleep is induced. In fact, there are some persons who become delirious from doses that would cause sleep in others. Several of the above-mentioned drugs cause a sleeplessness attended by sleepiness. Those under their influence feel sleepy but cannot fall asleep. Opium, belladonna, agaricus, and hyoscyamus are notable examples. Others, like coffee, cannabis indica, tea, coca, cypripedium, and scutellaria, cause complete wakefulness without the slightest sleepiness, but a condition of the mind in which the thoughts are unnaturally clear, active, and untiring. "They cannot go to sleep on account of the flow and multiplicity of thoughts."

These same drugs, as well as chamomilla, cactus, ignatia, pulsatilla, and nux vomica cause such a hyperæsthetic condition of the senses of hearing, touch, and sight, that all sounds, or contact, or light, keep the person awake. This is a common form of insomnia. The victims long for a place "where nothing happens"; "a place in the country; on an island, miles away from anything that can make a noise, except the gentle wind among the trees, or the murmur of waters."

If any of the medicines of which I have given the chief characteristics are indicated they must be prescribed in minute doses from

the 3d to the 30th. Indeed, if there is any place for the high dilutions it is in this malady. Now it is my belief, which eminent physiologists have demonstrated, that all those drugs which primarily cause active hyperæmia of the brain cause by their secondary effects passive hyperæmia, and even anæmia, both of which conditions cause insomnia. When passive congestion is present larger doses will be required, *i. e.*, large enough to cause slight physiological action. Medicines have more effect over sleeplessness from imaginary than real sorrows. The former are due to some derangement of the cerebral cells or the circulation, or the blood which supplies them. I know from positive experience that hyoscyamus will cure sleeplessness from imaginary jealousy, sense of being wronged, or anger and vindictiveness without real cause, or when the patient is sleepy and dull during the day and becomes very irritable and sleepless at night. This sleeplessness (in the insane) is attended with violent agitation, choreic movements, jactitation, twitching, and delirium of a destructive character. It is in just this kind of insomnia that the physicians of insane asylums report to have found hyoscyamine very useful. (Duboisine, in similar doses, is said to act like hyoscine.) From hyoscine and hyoscyamine 1-500th and 1-1000th of a grain, I have seen almost magical results.

Aurum is a splendid remedy for insomnia when one is kept awake by joyous thoughts, more joyous than occasion warrants. There is, at the same time, an ebullition of the blood; it seems to seethe and beat all over the body. This is the primary effect. The secondary effect of gold is to cause a torpor, coldness, and inaction of the whole body. The pulse is weak and slow, the mind depressed, melancholy, with thoughts of suicide, especially at night and when alone. For this condition the 2x of aurum acts curatively, while for the former state the 6x acts equally well. I have stated that a true insomnia is not caused by pain, but there is a condition of erethism or hyperæsthesia of the nerves of sensation, just as there is of the nerves of motion. In the former, a sensation which in health would not be painful—only annoying—is exaggerated into the semblance of a real pain, and causes the patient so much suffering as to keep him awake. The remedies for this condition are cannabis indica 8x, coffea 6x, chamomilla 2x, valerian 1x, and valerianate of strychnine 6th, ignatia 6x, cactus 8x, scutellaria 1x, and monobromide of camphor 1x to

8x. It is in such cases that Charcot's method of "suggestion" is applicable and of real value. The patient may be brought slightly under hypnotic influence, and then told quietly but firmly that she will fall asleep at a certain hour. This method generally succeeds. Another plan is to give a blank powder, or some discs saturated with some simple bitter substance, as gentian or columbo, and to insist that one or two taken when she goes to bed will cause sleep in about an hour. If I have the confidence of my patient, I have succeeded by this method when medicines failed. It is worth trying, and perfectly justifiable.

We turn now to a consideration of those medicines whose physiological effect is to cause sleep. Not all of them cause a normal sleep, in fact the medicines capable of this effect are very few, because normal sleep is not a negative, but an active, healthy physiological state.

The first class comprises those which cause sleep but have not the power to alleviate pain of a severe and positive nature. Chloral hydrate, the bromides, chloralamide, paraldehide, urethan, sulfonal, passiflora, somnal, and many others, have been largely used during the last few years. In recent cases of insomnia from grief and other powerful mental emotions, when the homeopathic remedy is not sufficient, I still keep my preference for chloral hydrate. A dose of ten, fifteen or twenty grains acts pleasanter, quicker, and causes a more natural sleep than any other drug. I know that some persons have an intolerance of it, and that it is not safe when there is a weak heart. In the latter case it should be combined with bromide of potassium in equal parts and given largely diluted. I have used chloralamide, paraldehyde, and urethan, but they are not better than chloral, although it is stated that they are well borne when chloral is not.

Sulfonal was very popular until it was discovered that toxic effects followed the medicinal dose in some persons. At first it was lauded as an absolutely safe hypnotic, but the same was asserted of every new drug when it first appeared. I do not consider it in any sense dangerous in doses of ten or fifteen grains, but its use should not be continued more than a few nights. It should be taken in the form of powder, or effervescing salt in hot water, and about an hour after the 6 o'clock meal, and the patient should go to bed within an hour. The

dose can be decreased instead of increased. In this respect it resembles chloral. Trional often acts better than sulfonal.

The bromides are so well known that I need not discuss them, but will state my preference for the bromide of sodium, as it is the most harmless of all. I never observed the favorable results Hammond claims from the bromide of calcium. Bromide of lithia acts quicker than any other, and is more useful in the sleeplessness which precedes apoplexy or cerebral rheumatism. The monobromide of camphor is a precious medicine for women and children, and neurasthenic men. It should be given in the lower triturations. Ten grains of the 1x is the largest dose necessary, and in children the 3x acts admirably.

Passiflora is a drug the position of which in materia medica has not yet been definitely settled. It is somewhere between gelsemium and chloral. It will cause sleep when pain is the cause of insomnia, or when it is caused by mental irritation, or when no cause can be assigned or felt. The dose is from ten to thirty drops every hour.

Pulsatilla 1x, aconite 3x, and arsenicum 6x will cause sleep when anxiety, restlessness, and fear of something indefinable is present. For that state, best defined as "figgitiness," pulsatilla nuttaliana is superior to the foreign plant.

Phenacetin, besides being one of the most trustworthy analgesic (anodyne) drugs yet discovered, is one of the best and safest of all hypnotics. In medicinal doses (five to ten grains) it causes no unpleasant or toxic symptoms. It seems to be a sedative to the general nervous system, and is equally good for sleeplessness from severe pain, as it is when no pain or discomfort are present. It is one of the best hypnotics for children (1x or 2x triturate) when the sleeplessness is from teething or from cerebral irritation. It acts well after coffea, bromide of camphor, and belladonna have failed.

Antipyrin, antifebrin, exalgine, and others of the same nature may under certain circumstances act equally favorable, but I rarely use them. In the sleeplessness of hysteria, bromide of camphor, asafœtida, castorium, valerian, and platina are useful.

Picidia erythena (Jamaica dogwood) has been found useful in insomnia. Its physiological action on the brain resembles that of chloral and hyoscyamus, having some of the effects of each. It has relieved insomnia from alcoholic excess (delirium tremens) and the

wakefulness of insanity. It is anodyne as well as hypnotic, and has relieved the pain of facial neuralgia, hemicrania, ovarialgia, and sciatica when they prevented sleep. When given for pain the dose is ten to twenty drops every two or three hours, and for sleeplessness alone twenty to thirty drops. I found it excellent in the insomnia from cardiac excitement, when the heart-beats were hard and rapid. In moderate doses it quiets cardiac irritation, and slows the heart's action.

The absence of an accustomed noise will often cause insomnia. People in health who go from the city into the quiet country cannot sleep for several nights, "because it is so still." The accustomed noise of a mill, the roar of the ocean, the dashing of waves on a beach becomes so much the part of the life of a person that their absence causes insomnia. I have known several persons who could not sleep for a week, because the clock which had been in the room for years ceased its monotonous ticking. Others could not sleep if they did not hear a watch ticking under their pillow. The brain-cells become so habituated to such noises that they miss them.

We become habituated to going to bed at certain hours. If we change the hour it is apt to disturb our sleep. If we are accustomed to eat heartily in the evening, we cannot sleep if we eat less, and the contrary also obtains. Dr. Eggleston says that most students and women who are troubled with insomnia are dyspeptic, and he has found it easy to treat successfully such cases without medicine. They are instructed to eat before going to bed, having put aside work entirely for at least an hour. If they are not hungry, they should be simply instructed to eat; and if they are hungry they should eat whatever they want. A glass of milk and a biscuit is sometimes all that can be taken at first, or a mashed potato buttered. In a short time the night appetite will grow, and the appetite will then need no particular direction. If possible, the night meal should be taken in a room other than the sleeping apartments, and for men in the city it will be found advantageous to go out to a restaurant. The idea of going out for something to eat and having to wait a short time for it will excite the appetite. Before eating, however, a bath should be taken; I much prefer cold or cool baths, which should be given with a sponge or stiff brush, and the body thoroughly rubbed off with a coarse towel afterwards. The bath need not be more than

five minutes in duration. After the bath and rubbing, or after eating, a moderate amount of exercise should be taken. For this, a few minutes with Indian clubs or dumb-bells is sufficient. Further than this, the patient should go to bed at the same hour every night, and arise at the same hour every morning. There is a popular superstition that grown people should not eat immediately before going to sleep; that it will give them indigestion or night-mare, or both. Dr. Eggleston cannot see why adults should be very different in this respect from babies. We know that young children awake at night, and must have something to eat before they will sleep quietly, and that some children actually fall asleep with a nursing-bottle leaking into the mouth. It may be true that digestion is carried on slowly during sleep, and that the digestive function is less active, but here one need not be in a hurry for the completion of the operation. The average person should be in bed seven or eight hours, which is time for the digestion of almost anything edible. In our American life, he thinks, the digestion carried on through sleep probably has the better chance for thoroughness.

I have arrested insomnia in many instances by advising a bowl of good bread and milk just before going to bed. These persons had been under the care of eminent neurologists who had advised a light supper. An empty stomach is a very frequent cause of sleeplessness.

In an article on the treatment of sleeplessness Dr. Eccles ("The Practitioner") says that in attempting to overcome the partial functional activity of the brain which appears to account for the dream-laden unrefreshing form of sleep, he has employed wet packing, abdominal compresses, cold bathing, elevation of the head by means of extra pillows, and application of warmth to the extremities by means of hot bottles and bags, with very variable and, generally speaking, little success; but a hot bath, taken immediately before the time which one wishes the patient to settle quietly for the night, has proved most valuable in producing a dreamless sleep, although not usually of longer duration than four hours without intermission, and sometimes followed by a period of great wakefulness, relieved only by a short morning doze; still, even where this somewhat uncomfortable vigil supervenes, the patient always feels more refreshed and happier the next day than after a long night of uneasy dreamy sleep. To effect the permanent restoration of refreshing

sleep a method of treatment is needed which must break the chain of vicious circumstances under whose thraldom the patient has lost the power to sleep. The brain in these cases is often found to be over-worked, and must be allowed to lie fallow as far as possible; the stomach, which has generally suffered with the other organs of digestion from extraordinary maltreatment, must be coaxed back again to a regular performance of its duties; while the muscular system, which has become wasted and inert from long disuse, must be called upon to fulfil its digestive and excrementitious functions, so long left in abeyance. Under the combined influence of the recumbent position in a quiet room, away from the cares of domestic, social, or business life, carefully modified diet, and massage applied as a therapeutical agent, not without regard to the mode, duration, and extent of its administration, the method of treatment referred to may be carried out with the happiest results in the majority of cases.

A change from the accustomed bed or sleeping-room, will often break up the insomnia for a time; even a change of the position of the bed. There is probably no truth in the belief that some persons sleep better when lying with the head towards the north magnetic pole.

Wakefulness is often caused by a light in the room. A sleeping-room should be as absolutely dark as it is possible to make it. Especially in case of infants and children.

If a patient with insomnia sleeps with anyone in the same bed, advise sleeping alone, shut off from any other room. Some women and children cannot sleep if they lie alone. We are obliged to inquire into all these conditions if we would be successful in relieving this plague of modern life.

SUNSTROKE.

(Heat Stroke, Insolation, Coup de Soleil.)

Definition.—A condition produced by exposure to excessive heat. There are now two forms recognized: heat-exhaustion, and heat-stroke.

Heat-exhaustion is caused by prolonged exposure to high temperature, particularly when combined with severe physical exertion, although it may affect persons who remain long in an over-heated

and poorly ventilated room, without exertion. The symptoms are extreme prostration, collapse, restlessness, cool surface of the body, pulse small and rapid, and subnormal temperature, as low as 95° or 96°. Exposure to the rays of the sun is not necessary. It may follow exposure to artificial heat, as in iron mills, or the engine rooms in steamships.

Heat-stroke is chiefly caused by the direct rays of the sun upon persons who are engaged in physical labor, especially in cities. Soldiers loaded down with heavy clothing and accoutrements are often victims. If the exposed persons have been drinking beer or whisky they are more liable to an attack. It is natural to suppose that in the tropics sunstroke is more common than in the temperate latitudes. This is not always the case. We do not yet know why certain places in the tropics where the heat is intense have less cases of sunstroke than others. It is probable that in low valleys shut in by mountain or forests the malady is more common.

New Orleans and Charleston have many cases, while St. Augustine and Tampa hardly any; in fact Florida is singularly free from this accident.

Pathology.—Rigor mortis occurs early, and putrefaction appears with great rapidity. The venous engorgement is extreme, particularly in the cerebrum. The left ventricle is contracted and the right chamber dilated. The blood is usually fluid, and the lungs are intensely injected. According to Dr. H. C. Wood, whose monograph on this disease is the best written, "Heat exhaustion with lowered temperature represents a sudden vaso-motor palsy, *i. e.*, a condition in which the existing effect of the heat paralyzes the vaso-motor centre in the medulla." Sunstroke with high temperature, he says, paralyzes that centre in the medulla which regulates the disposition of bodily heat. In this form more heat is produced and less given off than normally.

In sunstroke the patient may be struck down and die within an hour, with symptoms of heart failure, dyspnœa, and coma. This state of things may occur from excessive heat in a close room, if the man has been drinking liquor.

During one hot day in June, I was called to see a man who was attacked while working in the close, fœtid air of a basement, below some horse stables. He was stricken down at 10 A. M. and died at

8 P. M., with all the symptoms of sunstroke, high temperature, heart failure, and coma.

The usual symptoms are vertigo, pain in the head, oppression, vomiting, and colored flames before the eyes. Involuntary diarrhœa and micturition are common. Insensibility, soon deepening into coma, follows. The temperature ranges from 107° to 112°. During the coma the action of the heart becomes very feeble, the breathing hurried, shallow, of the Cheyne-Stokes type. A fatal termination may occur within twelve or thirty-six hours.

Treatment.—In heat-stroke, with sub-normal temperature, feeble heart, impulse quick, weak, and small, with cool skin and impending collapse, the indications are to stimulate the heart and the vasomotor centre in the medulla. No medicine does this so quickly and well as glonoine 1c., one or two drops on the tongue, or by hypodermic injection, every fifteen minutes until reaction sets in. The use of ice-cold water and ice in heat-strokes is criminal malpractice, yet I have seen it done in Chicago by the men sent out in the ambulances.

As soon as the pulse becomes stronger, and the heart's action normal, give bromide of camphor 1x, alone or alternated with cocculus, which are excellent remedies for sub-normal temperatures.

In sunstroke, with its cerebral congestion, headache, delirium, high temperature, and tendency to coma, gelsemium is the chief remedy. Given in doses of five drops every half-hour, or hour, it sometimes relieves the worst symptoms. In typical cases I should not hesitate to give the same dose of veratrum viride, until the pungent heat of the skin, rapid, hard, bounding pulse, and very high temperature was reduced. Veratrum will have this effect in fevers; why not in this malady, which is essentially an acute fever?

There is a condition in sunstroke which calls for nitroglycerine or amyl nitrite: namely — when, notwithstanding the failing heart, which appears after the stage of excitement, the temperature remains high. Here small doses are required, one or two drops of the 1-500th solution. A study of the provings of amyl and glonoine shows that they can reduce high temperatures with a weak heart, and that their effects in many respects are similar to cases of sunstroke. In heat-exhaustion stimulating doses are needed. In sunstroke during the

stage of depression, stimulation is also needed, but to a less degree. The use of ice, ice-packs, and ice-water baths, now so popular in hospitals, is of doubtful value, unless in cases of extreme high temperature, in very robust men. I am sure it is a dangerous method in many cases. The plan pursued in the army is much better and more successful. The soldier is stripped and laid in the shade, and water from a spring, well, or river poured over him; or he is placed in the water of a stream or spring. Now the water so used is rarely below 60° and generally 70°. This is as effectual in reducing a temperature of 110° as ice, and although it may take a little longer, is much safer.

Phenacetin is the only one of all the antipyretics that is safe. It is of real value, as its effects in several cases which I saw early in the attack proved to me. It relieved the pain in the head, the high temperature, and congestion; two grains were given every half hour. I believe it warded off a dangerous termination in each case.

I cannot recommend the use of quinine, as I believe it is an uncertain and dangerous drug in sunstroke. It was once recommended highly, and used hypodermatically—ten to twenty grains. Among the *sequelæ* of sunstroke is great sensitiveness to heat, even temperatures of 75° and 80°, which were not unpleasant before the attack. At 80° one of my patients became uneasy, had a feeling of fullness or lightness in the head, vertigo, and confusion. I sent him to the north shore of Lake Superior, where he improved, but suffered a good deal occasionally. For five years he was unpleasantly affected by heat and the direct rays of the sun, when I lost sight of him. Osler relates the case of a man whom he sent to Alaska to escape the heat, and that he was obliged while there to spend most of his time in a cellar. There are a great many very mild cases of heat-stroke, unrecognized at the time, which leave a sensitiveness to heat, unexplainable until the history of the case is traced back. I recall one case, a young woman in perfect health, who, after spending some hours in the Mammoth Cave of Kentucky, rode in the hot sun several miles to the railroad station. She was attacked with fever and delirium lasting several days, and had suffered for several years from what H. C. Wood designates as a kind of chronic meningitis. It is now six years since the attack, yet she cannot bear the direct rays of the sun even when

the mercury stands at 70° in the shade. The medicines which benefited this patient most were aurum 6x, mono-bromide of camphor 2x, and glonoine 3c.

In cases marked by swimming in the head, an uncertain gait, difficulty in concentrating the mind, and depression of spirits, phosphide of zinc 3x has been of great service.

Mono-bromide of camphor 3x, digitalis 30c., opium 30c., and aconite 3x are remedies of special value in the chronic cases.

DISEASES OF THE BRAIN AND NERVES.

It would be presumptuous for me to attempt to give the therapeutics of all the diseases of the brain and nervous system.

I shall treat only of those of which I have had some experience; or concerning which some new and noteworthy methods of treatment have lately been discovered.

IRRITATION OF THE BRAIN.

Definition. — Cerebral hyperæsthesia, with an exalted condition of its mental or sensory-motor functions. It may arise from simple mental excitement, overwork on business matters, excessive study, reading exciting books, or religious excitement.

In children it is caused during teething by the pressure of the teeth upon the tough gums, irritation of the stomach from improper food, worms, and irritating substances in the intestines. In adults it may arise from retention in the blood of the toxic constituents of the bile and urine, or the absorption of the ptomaines from imperfectly digested food and retained excretions.

In women it often arises from ovarian and uterine irritation. In both sexes from neuroses of the sexual organs.

In children one of the commonest causes of cerebral irritation is the use of red meats. No child under five years of age, unless living a very active out-door life, should be permitted beef or beef soups, except in the morning. Men and women who are very plethoric should not eat beef. I have known beef-eating children to become so irritable that they could not be managed during the day, and

their sleep was uneasy, troubled by screams, frightful dreams, or convulsive startings or complete insomnia.

No medicine benefited them, but when beef was taken away from their diet they had quiet days and restful nights. The effect of feeding beef to animals is well known. It will make the mildest become vicious, irritable, and ungovernable. I have treated several plethoric butchers, who were accustomed several times a day to eat raw beef, and also had beef at their meals. They complained of being so irritable that the slightest word or complaint, or anything occurring to annoy them, threw them into a rage. They felt vicious, pugnacious, sleepless, vertiginous, and had hot flashes and flames before their eyes. A diet of fish, chicken, and vegetables caused all these symptoms to disappear in a few weeks.

I observed in such persons that the pulse was hard, full, and eighty or ninety per minute. The capillaries of the skin, and probably those of the brain, were suffused all the time. There is but a step from erethism to acute congestion.

Treatment.—The first thing is to remove the cause. If it is brain work, enforce mental rest; if it is mental strain from business trouble, grief, and other emotions, we may palliate by means of sedatives, but never by alcoholic liquors. It is much safer to give small doses of the bromides during the day, and enough to cause sleep at night, if remedies homeopathically indicated will not effect quiet.

If it is caused by teething, scarify the gums if aconite or chamomilla does not relieve. If it is due to irritating substances in the stomach or bowels, expel them by an emetic of warm water, or mustard and water, or a purge of castor oil. If from worms, give santonin or naphthalin. Women are generally relieved by asafœtida, valerian, scutellaria, or bromide of camphor. If there is arterial excitement, aconite, gelsemium, veratrum viride, or belladonna.

In young children, or adults who do not drink them as a beverage, caffeine or theine will act happily, as will cannabis indica when the mind is exalted, joyous, and extravagant. If the patient is gloomy or irritable, hyoscyamus or hyoscine are very potent remedies. Above all, change the surroundings of the patient. Remove him from noise, and to a place of absolute quiet, as soon as possible. Allow no tea, coffee, beef, or liquors. A journey on the lake or ocean is one of the best sedatives. So is a life in the woods, or by

the shore of a quiet lake, and the enjoyment of fishing or rowing. It is probable that many cases diagnosed and treated as cerebral hyperæmia are really nothing more than cases of functional irritation, without any change in the cerebral circulation.

CEREBRAL HYPERÆMIA (Congestion of the Brain).

Definition.—An abnormal amount of blood in the cerebral vessels. There are two kinds of cerebral hyperæmia:

(1) *Active* congestion, in which a larger amount of blood than usual is sent to the brain. (2) *Passive* congestion, in which the blood is not actually increased in the brain, but, owing to obstruction, does not return freely through the cerebral vessels, which therefore become charged with blood. This is venous congestion or stasis.

In active congestion the symptoms are those of excitement. In passive congestion the symptoms are those of depression.

DIAGNOSIS.

Active Congestion.	Passive Congestion.
Wakefulness, erethism, pain in head, intolerance of light, noise, and pressure.	Head feels dull and heavy; limbs go to sleep; they have a heavy, paralyzed feeling.
Singing or ringing in the ears, sparks or spots before the eyes, contraction of pupils, heat and redness of face, full and strong pulse, throbbing of carotids.	Dullness of the senses; pupils dilated, pulse small and frequent. Respiration slow, irregular, or stertorous.
Spontaneous vomiting, grinding of teeth, vivid dreams, jerking of the limbs, vertigo, convulsions, hypertrophy of left ventricle of the heart.	Nausea, vomiting. Disease of the right heart, which tends to prevent the return of venous blood from the brain.

Notwithstanding the great divergence in the prominent symptoms, it is often difficult to make a positive diagnosis. When vaso-motor irritation is at the bottom of the trouble, these two states may alternate. Acute congestion may be very transient, as during a fit of anger or a paroxysm of coughing.

The "flushings" at the "change of life" is a brief congestion; but if the patient be very plethoric and the blood-vessels are atheromatous, apoplexy may result from these transient congestions.

Children are more prone to congestion of the brain than adults, owing to the thin texture of the skull, the open fontanelles, and the unossified sutures, while the softer brain substance exerts a much less counter-pressure.

Active congestion may be caused by the same conditions as irritability of the brain. It may be caused by the poison of some eruptive disease, as scarlet fever, measles, la grippe, or during the apyrexia of an intermittent fever. Convulsions from congestion often usher in these fevers.

Passive congestion may arise from debility, want of pure air, sufficient food, or from exhaustive diseases, diarrhœa, dysentery, cholera, and a weak, dilated heart. Finally, it may be caused by vaso-motor spasm, closing the arterioles of the brain.

Treatment.—The two varieties of congestion need an altogether different treatment. Active hyperæmia needs cool or cooling applications to the head, heat to the feet and extremities, and quiet surroundings, with a cool atmosphere and cool clothing. The stomach and bowels must be unloaded of accumulated fæcal or indigestible matter. Dry-cupping to the back of the neck, and the use of homeopathically indicated medicines, or those which oppose physiologically the existing condition.

The remedies according to the law of *similia* are glonoine, nitrite of sodium, ferrum phos., belladonna, hyoscyamus, stramonium, quinine, cannabis indica, paulliana, aurum, and agaricus.

Those which physiologically reduce the blood-pressure are aconite, gelsemium, veratrum viride, antipyrin, acetanalid, and the bromides. I have had the best success in the treatment of all but transient hyperæmia by the alternation of the two classes of remedies.

Aconite 1x and belladonna 3x act well together. Gelsemium 1x and glonoine 6x. Veratrum viride 1x and ferrum phos. 6c.

If there is a malarial poison in the system, bromide of sodium five grains, and quinine 3x or eucalyptus 2x go well together. Gelsemium (tincture) and cannabis indica 3x are very useful when both are indicated. Instead of alternating I have often given them mixed, and with the happiest results.

Sometimes atropine 6x or hyoscyamine 6x act with more promptness than do the dilutions of the mother drug. In some cases of threatening congestion, when convulsions or apoplexy are imminent,

I do not hesitate to give to an adult five drops of the pure tincture of veratrum viride, either by the mouth or hypodermatically. In the terrible congestion of the brain which occurs in puerperal women it is important to do this. I recall three cases where ten drops of the tincture veratrum viride were injected into the thigh. There had been several convulsions, there was trismus, red face, eyes blood-shot, delirium, etc. In each case, after the second or third injection at intervals of an hour, the pulse became soft, trismus relaxed, the pulse became normal, consciousness returned, and a rapid recovery was made. In other cases, treated with chloroform and morphine, or belladonna and hyoscyamus, the favorable change was slow and recovery tardy.

The bromide of sodium is better in many respects than the other salts, especially in children. If a teething child is threatened with congestion, we are never sure that convulsions may not soon occur. If scarifying the gums is not consented to, or thought advisable, and if a few doses of veratrum viride 1x, or belladonna 2x, do not act favorably, give five grains of the bromide of sodium and repeat it in an hour. Then to maintain the effect continue the belladonna. If an adult of apoplectic tendency, give bromide of lithium or bromide of ammonium. Like Hammond and Weir Mitchell, I have warded off apoplexy with twenty or thirty grains of either, the bromide of ammonium acting best when pain in the occiput is complained of; the lithium salt when the pain is diffused all over the head. Ergot is recommended for cerebral congestion from the fact that it has the power of contracting the arteries and arterioles. It is especially advised in *miliary aneurisms* of the capillary blood-vessels of the brain. The rationale of its action is generally misunderstood. Even Hammond, who gives doses of one drachm, does not correctly state the condition in which it is useful. It is not useful in any active congestion when there is arterial excitement, because with a strong-acting heart it will increase the cerebral fullness, for when it contracts the distal ends of the arteries, the heart's action is increased to overcome the resistance. Ergot acts curatively only when the heart is a weak heart and the coats of the arteries are relaxed from *vaso-motor paresis*. (When ergot is really indicated in uterine hemorrhages the same condition exists.) The patient must be lymphatic; his face pallid or livid; his flesh flabby, with distended

capillaries; under the tongue you will see small aneurisms, a sure sign that they may exist in the brain; the pulse is soft and sluggish, showing the same action in the heart. In such cases ergot, acting on the vaso-motor centres, causes a slow but permanent contraction in the whole arterial system, and gives the heart a normal tonicity. It does not require large doses, but the preparation of ergot must be good. Our tincture of secale will not do. Squibb's fluid extract, or Parke Davis & Co.'s "Normal liquid ergot," or any other similar preparation, should be used. Ten to twenty drops every four hours is quite sufficient.

Ustilago (corn ergot) has the same action as rye ergot, and can be substituted for it.

Phoradendron (mistletoe) has been used for the same condition.

Cimicifuga has a similar action, and when the symptoms correspond, will be found an excellent remedy, but in small doses, because it induces cerebral passive congestion primarily, while ergot and ustilago cause it by their secondary action.

Passive Congestion or *Stasis* requires quite different treatment, for the stasis is mainly in the veins. I am of the opinion that nearly all cases of true venous stasis are caused by vaso-motor spasm of the arterioles. In such cases, amyl nitrite can be used as a temporary palliative. It will relax the contraction while other remedies are acting. Nitrite of sodium has a longer duration of action, even longer than glonoine. The former can be given in doses of two grains of the 1x every four hours. The latter in doses of 1-200th or 1-100th of a grain, until its peculiar symptoms indicate that the arteries are open to the free passage of blood. It is said that the cobalto-nitrite of potassium has a slower and more permanent action than any of the above nitrites. The dose is one-tenth to one-fourth of a grain every four or six hours. The characteristic indications for the nitrites are the small hard pulse, with pallor of the face, cold hands and feet, and the symptoms of contracted arterioles.

When the opposite condition of the cerebral blood-vessels is present, namely: vaso-motor paresis, the arterial coats have lost their elasticity, and in this condition, while ergot and similar remedies give temporary relief, it is not lasting.

The object of treatment in passive hyperæmia is to keep the blood current moving through both veins and arteries, while not allowing

them to be unduly full. Now while belladonna, hyoscyamus, phosphorus, pilocarpine, eucalyptus, opium, and nux vomica are indicated for active acute hyperæmia by their primary action, their secondary effect is the reverse. If we give them, it must be to cause some physiological effect, when (in low dilutions) they will gently excite the circulation, and bring about a normal condition.

Phosphorus is especially suitable. It is a primary stimulant to the gray matter of the brain, and in large doses causing the same kind of hyperæmia that is caused by excessive study or any brain work.

But when the hyperæmia has lasted some time, or has been frequently repeated, the dilated vessels do not contract as they should. Hence it causes a *stasis*. Dr. Hammond values phosphorus very highly in this condition. He prefers the phosphide of zinc to any other preparation, but gives more than is necessary. The one-eighth or one-tenth of a grain deranges the stomach and bowels, while the 1-100th or 1-50th, given several times a day, does not, and is just as effectual as larger doses.

Eucalyptus, when given in large doses, causes flushing of the upper part of the body and head, throbbing of the temples, fulness, heat, and pain in the head, "a drunken feeling," with excitement, vertigo, and afterwards depression of mind and dullness of intellect.

This picture simulates acute hyperæmia followed by passive stasis. Eucalyptus shares with quinine a reputation as an anti-malarial medicine, and when the cerebral congestion occurs from malarial poisoning it can be substituted for quinine in minute doses during the primary hyperæmia, and for the large doses when stasis sets in. Dr. Hammond says: "The fluid extract has certainly in my hands been productive of excellent results."

There is one condition in which I have used pilocarpine (jaborandi) with benefit. When the hyperæmia occurs from a sudden chill, when then the skin is dry and cold, the mouth and throat dry, and the pulse feeble, then if one-tenth of a grain of pilocarpine is injected under the skin, or twenty drops of the tincture jaborandi given, the face and body will flush, a hot perspiration will appear with relief to the head.

As in other portions of the body, if venous stasis continues in the brain, especially of children and old people, œdema of the cerebral

tissue obtains. In such cases arsenic is the chief remedy. Its primary and secondary action is like phosphorus, except that while arsenic leads to œdema, phosphorus leads to fatty degeneration of the arterioles. Dr. Hammond, like Hahnemann, says it is indicated when the congestion is the result of extreme mental exertion with great anxiety of mind.

In passive congestions of old people Dr. Hammond recommends the cautious use of alcoholic stimulants. I have found small quantities of Tokay to act admirably. The same authority finds sulphuric ether very beneficial; a teaspoonful inhaled, or fifteen drops given by the stomach several times a day. A few drops of opium 1x is suitable when the patient is stupid, indifferent, and somnolent.

CEREBRAL ANÆMIA.

Definition.— A condition in which the quantity of blood in the brain is either reduced below the normal standard, or is impoverished. The first-named condition may be due to direct loss of blood, to deficient action of the heart, to impaired nutrition, or to some cause preventing the due access of blood to the brain; the second to disease of some organ concerned in hæmatosis, or to a general cachexia. The two states very often coexist. (Hammond.)

There is a temporary anæmia due to such depressing emotions as fear, or shock, or sudden grief, when the face will blanche, the hands and feet become cold, and syncope result. It is probable, however, that a partial failure of the heart to throw blood to the brain is the real condition. Cerebral anæmia may be suddenly induced by profuse hemorrhage, by lessening the whole volume of the blood; the pulse is feeble and thread-like; there is vertigo, ringing in the ears, blindness, and feeble respiration. In gradual cerebral anæmia these symptoms are present, but in a less degree. There is headache in a small spot; a sense of constriction around the head, over the eyes; vertigo on rising from a sitting or lying position. Loud noises are painful. The pupils are dilated, sluggish. The retina is sensitive to light. There is paresis of the ocular muscles, reading produces pains in the eyes and in the head. The use of glasses is often advised, but give only temporary relief. The complexion is pale, lips colorless or redder than normal. There is drowsiness, except on lying

down, when there is sleeplessness; such patients often sleep better sitting, or lying with the head high.

They have illusions, hallucinations, and melancholia. Local paralysis may result. In children and adults, after wasting diseases, such an amount of cerebral anæmia may result as to simulate, in children, hydrocephalus—and in adults, dementia. Impoverished blood, toxæmia, chlorosis, malnutrition, and malaria, may be the cause of the anæmia. In all cases, long-continued, the deficient supply of blood interferes with the nutrition of the brain, and with its normal functions. Authorities all admit that it is difficult to diagnose this condition from cerebral congestion, but Bauduy ("Diseases of the Nervous System") goes too far when he asserts that "the symptomatic manifestations of hyperæmia and anæmia are identical, and furnish no clew by which we can recognize and differentiate these two conditions of diametrically opposite pathological character." If he had qualified this by saying passive hyperæmia he would have been correct, for I cannot imagine it possible to mistake active congestion for anæmia. Hammond says, we must make a diagnosis by "a careful inquiry into the etiology; by the fact that drowsiness, not wakefulness, is a prominent symptom; that the pupils are dilated, not contracted; that the pain is limited to a small part of the head, instead of being general; that it, and the vertigo, is increased by the erect position, and diminished by lying down; that the ophthalmoscope shows retinal anæmia; that the face is pale and the skin cold; the pulse weak and feeble; that bellows murmurs are heard at the base of the heart and in the veins of the neck; that stimulants and tonics mitigate these symptoms."

Notwithstanding all this, there are anomalous cases, in which these symptoms are the result of passive anæmia, making a diagnosis very difficult.

Both Bauduy and Hammond warn physicians not to treat hyperæmia for anæmia, and vice versa, or dangerous consequences may result. Here lies one of the dangers of treating disease according to pathological theories; and one advantage to our school, of treating the symptoms when we are not sure of the pathological condition. The only harm we can do, is, that we allow the disease to go on without interference.

Treatment.— The first step is to ascertain the cause. If it is

malaria, remove the patient to a non-malarial region. If mal-nutrition, order the proper food and hygiene. If hemorrhage, arrest it. If from lactation, order the child weaned. If from imperfect digestion, treat the digestive organs. There is one cause of chronic functional cerebral anæmia, especially when due to vaso-motor constriction, that has been greatly overlooked, namely, the influence of reflex irritation on the vaso-motor centres. This malign influence generally starts from those outlets and orifices which issue from the pelvic cavity. If there exist in them constrictions or irritable growths, all means used for the cerebral anæmia will fail, until those causes of irritation are removed. This fact has been recognized by a few advanced thinkers, but to Dr. E. H. Pratt is due the honor of calling wide attention to it, as it has never been done before. When all rational procedures have failed to restore the normal equilibrium of the cerebral circulation, the rectum, vagina, uterine cervix, urethra, and bladder should be thoroughly examined, and any source of irritation found there removed. In choosing medicines we should first inquire, what drugs cause cerebral anæmia? There are two classes, namely: (1) Those which cause it by acting on the vaso-motor centre, as the bromides, ergot, hydrastis, zinc, baryta, digitalis, nicotine, strychnine, caffeine, lobelia. These, and many other less important drugs, cause cerebral anæmia by constricting the arterioles in the brain; (2) those which decrease the amount of blood in the brain by depressing the action of the heart — among which are gelsemium, aconite, veratrum viride and veratrum album, cactus, and other cardiac poisons. All these are homeopathic to cerebral anæmia; but right here allow me to state a singular fact which has been observed by many of our school: namely, that the drugs most exquisitely homeopathic to a pathological state very often disappoint us as curative agents. Why, I will not attempt to explain. Certain it is, that the bromides and ergot are not successfully used in minute doses in cerebral anæmia, and they are types of this class. Hart ("Diseases of the Brain") recommends arsenic, but arsenic does not cause cerebral anæmia by vaso-motor spasm, but by causing an œdema of the brain which presses on the cerebral vessels; or by injuring the integrity of the blood. He also recommends veratrum album, but only when exhausting diarrhœa or cholera causes a diminution in the volume of the blood.

Hahnemann recommends camphor, which doubtless causes vaso-motor spasms; but he advises it only when exhausting discharges, or "shock" causes syncope, and he nowhere advises minute doses — which seems contradictory to his general practice. Camphor is only suitable in transient cases where a shock of some kind, or some violent congestion of some other organ, takes the blood from the brain. I do not think we will ever find the "exquisitely" homeopathic remedies useful in sudden cerebral syncope. My experience is that we have better success with those which act physiologically by increasing the amount of blood in the brain. These medicines are those which relax vaso-motor spasm, like amyl nitrite, soda nitrite, glonoine, or alcohol. The inhalation of a few drops of amyl, the one-hundredth of a grain of glonoine, two or three grains of soda nitrate, a few drops of camphor, or a spoonful of brandy or alcohol, are generally sufficient, with the aid of the recumbent posture, to cause the normal amount of blood to enter the brain. In some cases it is better to place the head lower than the body; or to ligate the lower extremities; or apply hot applications to the heart. The treatment of the more persistent cases of cerebral anæmia, when it arises from loss of blood, is to give meat juices, beef tea, eggs, etc. One of the best of all beef extracts is Valentine's meat extract. It is made from the blood of beef, and the expressed juice of the meat. It offends neither taste nor smell, and is pleasantly sweet and aromatic. A teaspoonful is equal to an ounce of ordinary beef tea. The recumbent position is imperative, until the anæmia is better. Passive exercise, by massage, is the only exercise to be permitted. China (cinchona) is doubtless the best medicine, but I am frank to assert that I never found the attenuations of any value, except the 1x, in twenty or thirty-drop doses, and then the alcohol played an important part in the cure. The tincture in ten-drop doses in a spoonful of Tokay, port or brandy, is very efficient in all cases. In some cases only a few drops of brandy or Tokay are well borne at first. If there is a malarial cachexia, arsenite of quinine is very efficacious, also natrum mur., and arsenite of iron. In the cerebral anæmia of chlorosis, permanent improvement will not come until the general anæmia is improved. It is useless to dose the patient with iron, because iron is rarely indicated in real chlorosis. Arsenic, strychnine, and phosphorus are the real remedies, aided by pure air,

good food, cheerful surroundings and rest. Hammond recommends the inhalation, three times a day, of three drops of amyl in the treatment of severe chlorosis. It opens the cerebral blood-vessels, and allows the blood to enter therein, and in that way increases the nutrition of the brain; a suggestion which I have found of positive value. One of the best medicines to keep open the cerebral vessels is aurum. I have used it extensively in all cases of real anæmia of the brain, and am certain it aids in giving nutrition by causing the blood to fill the brain. It dissipates the drowsiness, melancholia and brain weariness. Its effects last longer than the nitrites or alcohol. One tablet, containing the one-hundredth or one-fiftieth of a grain, given three times a day, is sufficient. I prefer the muriate of gold and sodium to any other preparation. Zinc is the sovereign remedy for the cerebral anæmia of children, brought on by exhausting diarrhœa, fevers, or from repeated cerebral congestions. This condition is the "hydrocephaloid state" described by Marshall Hall. In some cases picrate of zinc, 8x or 6x, is more potent than zinc alone, because picric acid causes a more profound cerebral paresis. It ought to be good alone, and may prove so in some instances, but I like the compound better. The phosphide of zinc, efficient in passive hyperæmia, is useful in anæmia, but in smaller doses, 3x or 6x. In the "brain fag" of literary and business men these remedies are unsurpassed. I have had brilliant results from arsenite of copper, arsenite of strychnine, and arsenite of gold. The indications must be taken from our provings of the elements of which they are composed. The practical physician will appreciate their value when he tests them.

Hydrastis has been my favorite remedy for years in cerebral anæmia because it is homeopathic not only to the state of the brain, but to the faulty digestion and assimilation which often attend, or may be the cause of, cerebral anæmia. The tincture, or 1x, of hydrastis, or hydrastin 3x, may be used, but I prefer the white alkaloid in the form of the hydrastia muriate. This is the most potent combination of that drug. The 3x trituration—one grain before meals—acts well, but I prefer a preparation like the following: Hydrastia mur., one grain; dilute muriatic acid, one drachm; pepsin purum, one drachm; glycerine, one-half ounce; distilled water, three and a half ounces. Dose, a teaspoonful before meals. The hypophosphite of soda in doses of one to three grains, according to the age of the

patient, acts happily when there is great nervous prostration. If there is much emaciation and mal-nutrition, give an emulsion of cod-liver oil and hypophosphites; and to each teaspoonful add ten drops of tincture of saw palmetto.

A common cause of cerebral anæmia is cardiac weakness. The heart is simply a pump, which, in its normal state, forces a certain amount of blood with a certain pressure, and, when a person is standing, to a certain height. If the heart is injured in its valves, or the radical force which moves it is deficient, the amount of blood which it throws to the head will be less than normal.

Hypertrophy, with dilatation, stenosis of the valvular orifices, or aortic aneurism, will cause cerebral anæmia.

In such conditions we must increase the forcing power of the heart. If veratrum or arsenic or nux vomica does not increase it, digitalis, strophanthus, anhalonium, or cactus should be used in doses of five drops of the mother tincture three times a day. The addition of one drop of glonoine, 1c. or 2c., to a dose aids greatly the beneficial action of these medicines.

HEADACHE.

Definition. — Cephalalgia means simply pain in the head, but it should be divided into two kinds, namely: (1) Headaches depending on causes within the brain; and (2) headaches depending on causes external to the brain. These two divisions must be subdivided as follows:

INTRA-CEREBRAL HEADACHES.

(1) Cerebral Anæmia.
(2) Cerebral Hyperæmia.
(3) Sympathetic Headache.
(4) Dyspeptic, Bilious, or Sick Headache.
(5) Neurasthenic or Nervous Headache.
(6) Congestive Headache.
(7) Plethoric Headache.
(8) Arthritic or Gouty Headache.
(9) Toxæmic Headache.
(10) Organic Headache.
(11) Headache of Childhood and Old Age.

EXTRA-CEREBRAL HEADACHES.

(1) Rheumatic Headache.
(2) Periosteal Headache.
(3) Neuralgic Headache.

It may seem an unnecessary refinement to designate so many kinds of headache, but I am satisfied of its importance. The time has passed when we can ignore the pathological basis of diseases. I assert the truth, that as believers in the law of *Similia* as a general guide to the administration of medicines in diseases, it is more important for *us* to know the pathology of disordered states than it is for physicians who do not believe in our law of cure.

The so-called regular school can treat headaches only by hygiene, antipathic medicines, chemical agents, derivatives and palliatives.

We can adopt all the above means, and in addition, we have an immense advantage over all, by resorting chiefly to the medicines indicated by the law of *Similia*. I am aware that a few of our school who imagine it their duty to adhere to the strict interpretation of Hahnemann's directions to select the remedy by the *totality of the mere symptoms — ignoring the pathological cause of those symptoms*, will scout the idea of selecting a remedy for headache in any other way; but my knowledge of the action of drugs enables me to assert, without fear of contradiction by scientific men, that two individual drugs may cause a group of identical symptoms, yet the pathological state may be altogether different. In view of this fact I contend that we should be acquainted with the pathological actions of drugs, in order to differentiate between medicines, the symptoms of which are very nearly similar.

Our knowledge of the pathology of drugs is yet limited, but the time will come when it will equal our knowledge of their symptomology. By the pathological effects of drugs, I mean their physiological effects carried to an abnormal degree. Therefore, when giving the treatment of the above mentioned varieties of headache, I shall give not merely the symptoms, as too many of our text-books do, but also the indications for the hygienic, chemical, antipathic, and physiological, as well as the homeopathic uses of the medicines recommended, as correctly as it is possible to do, with our present knowledge of their action.

Headache from Cerebral Anæmia.—Haller computed that the brain normally receives one-fifth of the blood in the body. Dr. Day, in his invaluable work on "Headaches," says: "In the brain the demand for healthy blood is two-fold. In common with all the tissues of the body it requires a due supply of nutrient material for the maintenance of its structural integrity and functional efficiency, but a more urgent demand is for the oxygen which is conveyed by the hemoglobulin of the red corpuscles." . . . "Whenever the red corpuscles with their constant supply of oxygen are not passing through the capillaries of the brain in sufficient number, we have a cerebral anæmia." The blood itself may be of due composition, but virtual cerebral anæmia may arise from a weak action of the heart, functional or organic in origin, through the slow transmission of blood along the vessels, or the cerebral blood-vessels may be diseased and obstruct the passage of blood by loss of elasticity or actual narrowing, as in advanced life.

There is a *general* and *partial* anæmia of the brain. Local cerebral congestion may occur in one portion of the brain, causing anæmia of other portions. General anæmia and a cachectic state of the blood induce cerebral anæmia, which may cause a double set of symptoms to appear.

I have already, in the article on "Cerebral Anæmia," entered as fully into the symptoms as my space will permit. I shall therefore mention only the most characteristic symptoms of the anæmic headache. These are: fits of depression and low spirits, fearfulness and timidity, dread of things unlikely to happen, sleeplessness at night and drowsiness by day. The pain is on the top of the head, which feels hot and burning to the hand. The pain is not throbbing or bursting, but of a gnawing, scraping character. (One exception to this is that after great loss of blood, patients often complain of a pulsating or "hammering in the top of the head.")

The tongue is generally furred at the back if the condition has been of long duration and there is flatulence and constipation. The colon is loaded and torpid from deficient muscular contraction, which is common in all forms of impaired functional activity of the brain. The pupils may be dilated or contracted. An excellent diagnostic measure is the use of the ophthalmoscope. If anæmia is present it will reveal pallor of the optic disc and dullness of the choroid. The

blood-vessels of the retina are generally pale, and the disc is of a pale and waxy hue.

The pulse is weak and small; slight pressure obliterates it. I have seen cases where the pulse was very slow and weak — not over 50 per minute — without any organic heart disease. Often the pulse is rapid, 120 per minute. A weak, paretic heart may cause the two extremes of pulse, and is often the chief cause of cerebral anæmia.

An anæmic brain is often the principal cause of chronic alcoholism. It causes a desire for stimulants, which give only a temporary relief, and lead to the habit of using alcoholic liquors. This leads also to an inordinate craving for and abuse of coffee. Many patients are "fit for nothing" in the morning until they have swallowed a cup of strong coffee, which temporarily congests the brain. Cerebral anæmia readily leads to the opium habit, for the same reason. Opium or morphine should be given such patients only as a palliative and at long intervals.

The headache from cerebral anæmia is not generally paroxysmal; it is wearing and continuous. But paroxysms may be caused by fatigue, excitement, and mental labor. These paroxysms are usually preceded by flushing of the face, due to the flushing of the brain, while under excitement. But this is followed by the opposite condition, of empty blood-vessels. Unless narrowing of the blood-vessels exists from atheroma, the coats of the cerebral vessels are relaxed, and readily dilate under excitement or from the smallest quantity of alcohol or stimulant drugs. This is the reason why those who have anæmia of the brain cannot take wine, coffee, or opium, even in small quantities, without flushing of the face.

Treatment.—The restoration of the brain circulation in cerebral anæmia does not require the use of drugs so much as good food, pure air, and pleasant surroundings. Pleasant society, cheerful scenery, out-of-door sports, hunting, fishing, and other recreations are necessary. No mental labor should be undertaken, no night work, no artificial stimulants; the patient should go to bed early — as early after a late supper as possible, and he should lie in bed in the mornings as long as he desires.

All weakening discharges should be checked. The food should be digestible and nutritious. Fats like bacon and butter, meats which are tender and contain red blood, and the most nutritious

cereals and vegetables should form the chief diet. If the bowels are confined they should be opened by the use of prunes, peaches, figs, dates, bananas, apples, etc. But little coffee should be allowed. No wine except a little good sound claret or Tokay. If the bowels are loose, with passages of half-digested food, they should be corrected by the use of bismuth or phosphoric acid, combined with pepsin or pancreatin. If meat is not digested, use the former; if the starch, use the latter. Papoid acts in both conditions.

A good preparation is "Maltine with pepsin and pancreatin." "Forbes's Diastase" favors the digestion of starch. If milk is used it should be violently shaken; this makes it much more digestible. Nux vomica, strychnine, and hydrastin all increase the power of digestion and assimilation; so do muriatic, nitro-muriatic, and phosphoric acids. If the colon is obstinately torpid give a pill of one-eighth of a grain of aloin, or aloin one-eighth with strychnine one-hundredth of a grain. A good laxative pill is nux vomica one-fourth of a grain and hydrastin one-fourth of a grain.

Arsenic is one of our best remedies in cases of lientery, where the food is only half digested. The best preparation is the arseniate of iron 2x. "Levigo water," from a spring in the Tyrol, contains this combination. Give a teaspoonful in half a glass of water after each meal. This drug is indicated in general anæmia, where the whole mass of blood is poor in hæmoglobin.

The 3x of hypophosphite of iron is sometimes preferable. We have in this country many ferruginous springs which can be used with benefit, but the patient must be cautioned to use them sparingly.

There is no medicine in our Materia Medica better adapted to the treatment of headache from anæmia of the brain than cimicifuga. It corresponds to the depressed mental condition; to the melancholy and irritability; to the condition which verges on delirium tremens, and to various painful sensations so characteristic of anæmia. (Gymnocladus has similar head symptoms.) It resembles platina in many points, but the head symptoms have some notable divergence. One example is that platina has a downward pressure on the vertex, while cimicifuga has an upward pressure as if the top of the head was being forced off.

When the anæmia of the brain depends upon a weak heart, the blood itself being normal, cardiac tonics are useful. Digitalis, five

drops three times a day; strophanthus, cactus, or collinsonia in the same dose, will soon impart sufficient propelling power to the heart. If the heart is thin and dilated, always add to each dose one-hundredth or one-sixtieth of a grain of strychnine or one-eighth of a grain of extract of nux vomica or ignatia.

During a paroxysm of anæmic headache the patient should not attempt to sit up, but must lie with the head low, and have warm or hot applications made to the vertex. In this position, a few whiffs of amyl nitrite, two drops, will remove the pain as if by magic, or a tablet of one two-hundredth or one-hundredth grain of glonoine will do the same. It can be repeated in one or two hours.

If the pain is persistent, a tablespoonful of champagne every half-hour acts admirably.

Veratrum album is indicated 3x or 6x when the face is pale, with cold nose and forehead and cold sweat on the head. Arsenicum 3x is indicated when there is present the extreme restlessness peculiar to the drug. Both can be repeated every fifteen minutes.

Aurum is one of our best remedies to prevent such paroxysms if they are frequent. Give a tablet of the 2x three times a day continuously for weeks. I prefer the chloride of gold and sodium, the bromide of gold, or the arseniate of gold. Platina and argentum act like gold, and may be as efficient if indicated by their symptoms. If rigidity or narrowing of the blood-vessels is present, iodide of soda, three grains before meals, has been productive of good results.

HEADACHE FROM CEREBRAL HYPERÆMIA.

In my article on hyperæmia of the brain I have fully discussed this condition, and will not add to it, except to mention a few remedies which have been found useful during the paroxysm. Persons subject to these paroxysms are generally those whose habits are sedentary, who eat too much, and drink too much coffee or wine, or are prone to fits of anger or mental excitement. During the paroxysms the head is hot, the face flushed, the temporal arteries throb, the eyes are red, and the pulse is hard and full or hard and small. In the former case no remedy is so effectual as veratrum viride, one drop of the tincture every half-hour—one or two doses often relieving the headache. If the pulse is small, wiry, and hard, aconite is

specific. The one-tenth of a drop every half-hour gives prompt relief.

Gelsemium, in the same dose, acts equally well, but instead of the anxiety and mental restlessness of aconite there is a stolid, quiet, flushed face, and sleepy look in the eyes. Belladonna, agaricus, hyoscyamus, nux vomica, lachnanthes, cactus, cannabis indica, glonoine, ignatia, and phosphate of iron are primarily indicated, and they should be prescribed in the 3x or 6x attenuations. If the attack has been brought on by eating to excess, the stomach should be emptied immediately by an emetic of mustard-water, warm water, or one-eighth of a grain of apormorphine; very prompt, easy vomiting is caused by the latter if injected hypodermically. At the same time, if the feet are cold, they should be immersed in hot mustard-water or a hot-water bag applied.

We cannot deny the value of the bromides as palliatives in hyperæmic headaches. Their use is as justifiable as heat to the feet and cold to the head. They cause a temporary contraction of the blood-vessels of the brain, and instead of interfering with the action of the similimum they prepare the way for its efficient use.

For quick results in severe cases I prefer the bromide of lithium (ten grains); next in value is the sodium salt (fifteen grains), or, in nervous women, the mono-bromide of camphor (one-fourth of a grain). Give a single dose, and follow it by the appropriate remedy. Antipyrin 1x, ten grains every half-hour, has had good effects in some cases, but five grains of the crude drug is frequently given, with quick removal of the pain.

SYMPATHETIC HEADACHE.

There are almost as many kinds of sympathetic or reflex headache as there are organs in the body, but the principal organs that cause headache are the liver, stomach, colon, rectum, uterus, ovaries, and the sexual organs in general. A good example of reflex headache is when a decayed tooth causes an intense pain all over one or both sides of the head; or when swallowing ice, or eating ice-cream, sets up an intense headache as soon as it reaches the stomach.

In the headaches from irritation of visceral organs the irritation is conducted along the pneumogastric and great sympathetic, until

it reaches the brain. The sympathetic headache most often met with in practice is the *menstrual* (ovarian or uterine).

Menstrual headache occurs before, during, or after the flow. The flow may be normal, scanty, or too profuse. It is not the uterus in such cases that is generally at fault, but the ovaries. I believe it occurs oftenest in unmarried women, and I know of many instances where such headaches, lasting years, have disappeared after marriage. There is an evident reason for this which need not be explained. It very often returns at the climacteric period and lasts until the final cessation of the menses and sometimes long after. It usually affects the vertex, occiput, and temples.

There is one kind of headache that is certainly dependent on uterine irritation — namely, when a narrow or bent cervix causes the menses to flow with great difficulty and local pain. This variety can be cured only by dilating and straightening the cervix, as several cases in my records attest.

When the headache is caused by scanty menses, depending on ovarian paresis, it can be cured by conium, sepia, graphites, aurum, cocculus, asarum, senecio, and sanguinaria, selected according to the symptom. There is another class of remedies of which we have no satisfactory proving, but of which the physiological effects are to increase too scanty menses or cause them to appear when delayed. These medicines are often more potent in the cure of headaches from such cause than those above mentioned.

They are, senecin (one grain three times a day), apioline (a capsule three times a day), bin-oxide of manganese (two grains three times a day), pulsatilla (five drops three times a day), sabina (five to ten drops three times a day), sanguinaria (five to ten drops three times a day), oxalic acid (one-eighth to one-fourth of a grain three times a day), and hedeoma (thirty drops of the tincture three times a day). The faradic current applied to the ovaries and uterus will often increase a scanty flow.

All these should be taken for a week before the menses, until they return in normal quantity. If the menses are too profuse, sabina, secale, carbonate of calcium, china, platina, trillium, aurum, crocus, hydrastis, thaspi, and all the medicines in the second class mentioned for scanty menses, are useful in doses varying from ten drops of the tincture (hydrastis, trillium) to the third attenuation

(platina, aurum). All the physiological emmenagogues, when used for menorrhagia, should be given in the 1st, 2d, or 3d attenuation.

There is a kind of headache, generally occipital, usually following menstruation. The menses may be scanty or profuse, but during and after the flow there exists a sexual hyperæsthesia (erotism, or erotomania). There are doubtless many more such cases than we are aware of, for the natural modesty of unmarried women does not allow them to disclose the fact. I have treated many such cases, and I have found that bromide of camphor, one-eighth to one grain several times a day, cured some cases promptly. Five cases on my records were cured by bromide of ammonium. The pain was occipital, there was insomnia, genital irritation (pruritus), and very profuse menses with ovarian pain. Five grains four times a day, given five days before the menses, and so long as they continued, made the flow normal, prevented the sexual erethism, and palliated the ovarian soreness.

Platina is homeopathic to the same symptoms, yet it has failed in all my cases but one. Why, I do not know.

Salix niger, a tincture made from the buds of the "pussy" or "black willow" is a physiological anaphrodisiac. It acts happily for a condition similar to that cured by bromide of ammonia. The dose should be fifteen to thirty drops four times a day, before and during the menses.

Salicin, the alkaloid of white willow bark, is said to possess the same properties, and has cured similar cases, in doses of one to three grains given as directed for salix niger.

There are two remedies I ought to mention for headache from scanty menses. These headaches are marked by heaviness in head. The face is cold, also the feet, hands, and body, with shivering, and a small, feeble, or wiry pulse. In such cases the inhalation of a few drops of amyl nitrite will cause the menses to appear normally, and dissipate all the other symptoms. A dose of the one-hundredth or one-fiftieth of a grain of glonoine will have the same effect.

Hot gin and water is a popular remedy in such cases. It acts as does amyl and glonoine, by dilating the arterioles, and filling the capillaries of the body. Some of its effect may be due to the oil from Juniper berries which are distilled with the gin.

BILIOUS-DYSPEPTIC OR GASTRIC-HEADACHE.

This is often called "sick headache," because vomiting occurs when the pain is at its height, and dispels the pain as if by magic.

"No headache ought to be called bilious unless there is so copious a secretion of bile that it either accumulates in the duodenum to regurgitate into the stomach, or causes the skin to turn yellow from its absorption into the blood." (Day on "Headache.") A genuine bilious headache is less common among women than men, who commit greater excesses in eating and drinking. Young people of both sexes are liable to it. The pain comes on in the morning after a heavy meal the night before, or after drinking too much wine; or it succeeds after a heavy midday meal, if the person is not accustomed to it; or if the food is hurriedly eaten, and exertion and fatigue follow it. The pain occupies the whole forehead and top of the head, which feels hot and burning. The face is flushed, and the temporal arteries throb. A hot room, or stooping, brings on nausea, and aggravates the pain.

If the patient avoids taking food he manages to get through the business of the day, but when evening arrives, if he attempts to eat, the pallid face is exchanged for one of vascular excitement, and throbbing headache, followed by a violent attack of vomiting, after which he suddenly and unexpectedly falls asleep, and wakes next morning well; this headache may continue for several days, unless something is given to remove all the fermenting, undigested matter from the stomach and soothe the irritated gastric mucous membranes.

Treatment.—The radical cure of these gastric headaches requires that the patient shall change his mode of life. He must not indulge in rich and indigestible food, or alcoholic liquors. Unless he does this we can only palliate the severity of the attack and each repeated attack will leave him in a condition more susceptible to others. The immediate or palliative treatment of an attack, like the one described brought on by improper food, should consist in the removal of the offending mass in the stomach. If there is nausea, let the patient drink sufficient warm alkaline water to produce emesis. In old people and children, an overloaded stomach causes such sympathetic cerebral irritation that convulsions or apoplexy may result, and we must unload the stomach quickly. No remedy will do this as quickly

as apomorphine — one-twentieth of a grain for a child, and one-tenth or one-fifth for an adult.

When the stomach is empty then we can give the appropriate remedies, which are generally nux vomica or bryonia, iris or chionanthus.

Sometimes it is only necessary to give some chemical or antiseptic antidote to the acid or ferment developed in the undigested food in the stomach. The laity understand this and resort to bicarbonate of soda, Tarrant's seltzer, or Husband's magnesia, with satisfactory results. I have used sulphite of soda in twenty-grain doses, giving immediate relief, and the bromide of strontium in the same quantity ought to be an admirable remedy, for it arrests the acid eructations and the pyrosis, antidotes the fermentation and the gases of decomposition; while the bromide constituent will promptly relieve the pain and congestion in the head. Sub-gallate of bismuth, five grains every two hours, is perhaps more useful.

There are persons who do not seem to be able to vomit — the retching efforts are fruitless. For such, the rapid-acting bitter waters (Rubinat or Frederichshall) are appropriate. Tarrant's seltzer aperient (Rochelle salts and bicarbonate of soda) is a pleasant effervescing aperient, and will remove the fermenting food in an hour or two.

If the patient is so anxious to be cured that he will be temperate in his diet, we can restore the tone of his digestive apparatus by giving him a tablet of nux vomica (one-tenth of a grain) and bismuth (two grains) before each meal, and a spoonful of maltine with pepsin and pancreatin after meals. If the liver is torpid, the skin muddy and yellow, and digestion slow, five drops of dilute nitro-muriatic acid before meals and a drop of nux vomica 1x after meals, will cause rapid improvement.

There is an occipital headache, reflected from a congested liver, which is sometimes rebellious to treatment. The pain is so severe as to be mistaken for occipital neuralgia, but is so evidently reflex that we can relieve it only by a sedative action on the stomach, and a restoration of the functions of the liver. We may prescribe day after day according to the mere symptoms, but we shall not benefit the patient until we give a physiological remedy. My experience has been that one or two grains of mercurius dulcis or blue mass, at

night, followed by half a tumbler of Rubinat water in the morning, will remove the headache more completely than any other medication.

The same result may sometimes be as quickly accomplished by giving one-tenth of a grain of euonymin, leptandrin, irisin, or podophyllin before each meal and at night. The addition of three to five grains of subnitrate of bismuth, before meals, adds greatly to their efficiency.

Chelidonium, carduus, sanguinaria, eupatorium, juglans myrica, phytolacca, ptelea, and triostium are sometimes indicated in bilious headaches. Salicylate of soda is reported to have cured many cases.

Congestive Headache does not differ materially from active hyperæmia of the brain, and the treatment is the same.

Headache from Plethora requires in most cases only a low diet—abstinence from all red meats and malt liquors, with enough Congress or Hathorn water to keep the bowels open if they are sluggish. One drop of veratrum viride three times a day is the only medicine necessary.

HEADACHE FROM EYE-STRAIN.

Much has been written since 1874 in regard to the relation of ocular defects to headaches, when Dr. Mitchell first directed attention to the cerebral results of eye-strain; hence it is important to consider for a moment his present views in regard to the relation of eye-strain to the production of permanent headache in the sense in which it has been defined in this article. "I have rarely seen very constant headaches due to eye-strain," writes Dr. Mitchell. "The intra-cranial distress from eye-strain comes and goes, and if the trouble is typically hemi-crania it is not apt to be caused, even if it may be intensified, by defective eyes. I have sometimes, however, had a clinical suspicion that it is possible for imperfect eyes, long used to excess without correction, to give rise to a condition of occipital headache, which may be called permanent in the sense that it continues for years to survive the cause." This suggestion embodies an interesting explanation of some of the types of permanent headaches, for, of course, no reference is now made to the fact, which seems perfectly well established, that from forty to fifty per cent of the cases of functional cephalalgia are largely amenable to the treatment of refractive defects and insufficiencies of the ocular muscles.

Another very important point attaches to this clinical suspicion—namely, the occasional apparent inefficiency of correcting an ocular defect when, other causes for headache having been eliminated, it seems as if it ought to be the means to bring about relief. Once more to quote Dr. Mitchell: "Under these circumstances the mischief has lasted long enough to leave in the brain tissues some lasting result of a too-protracted strain, and we have as a consequence either permanent or very frequent headache." His surmise is that, under these circumstances, the centres affected are left in an altered, perhaps congested, state, or with a tendency readily to become congested even by the reasonable use of the eyes. The evident prophylasis is the correction of ametropic eyes, or, more properly, astigmatic eyes, during the formative period of life, when the degree of the defect warrants interference.

Some dispute exists in the ophthalmological world in regard to the amount of the refractive error which should be neutralized. Some surgeons are satisfied only with the so-called "full corrections"; others base their corrections upon a definite rule, which requires that a given quantity of the refractive defect be allowed to remain unneutralized in such cases; others order the "manifest correction"; and still others (and this seems rational) determine the amount of the error, which should be corrected according to the patient's occupation, the apparent needs of the case, and the amplitude of accommodation and convergence. In this connection Dr. Mitchell's views, based upon the observation of a great many cases of headache, are instructive. He says, "There are sufferers from headache due to defective eyes who cannot endure very exact correction without increase of pain. There are others who find full relief only when the correction is very accurate." We assume that the use of the words "exact" and "accurate" used by Dr. Mitchell is equivalent to the term "full correction," usually employed by ophthalmic surgeons, and that it is understood, except under certain circumstances, that coexisting astigmatism should be completely neutralized. This is a just summing up of the case, for it is an undoubted fact that some patients with ocular headache find relief only in a full correction, although a vast majority (of hypermetropes, at least) are not comfortable under such conditions."

Treatment. — Medicine cannot cure so long as the eyes are used

in reading, writing, or such exercise of vision; glasses must be prescribed; but much can be done to assist rest and glasses by the administration of epiphegus, onosmodium, natrum muriaticum, ruta, cimicifuga, and other remedies recommended in works on the eye. Phenacetin, spigelia, belladonna, and hyoscine are the best palliatives.

Chloral hydrate causes asthenopia almost invariably, with a peculiar conjunctional irritation. It ought to be used homeopathically for headache from eye-strain, and should cure recent cases, but I find no record of its clinical use.

NERVOUS (NEURÆSTHENIC) HEADACHE.

Dr. Day devotes forty-five pages of his great monograph to this form of headache. Any full description of its multiform manifestations, its symptoms, and the various conditions of the brain which cause it, would occupy too much space in a volume of this scope. It is in some cases due to an epileptiform neurosis; in others to an abnormal condition of the nerve centres; in others to "nerve storms" which are brought about by mental excitement, mental depression, or intense study. It seems to be hereditary in certain families, some member of which may have epilepsy, some insanity, and others visceral neuroses. It is not so much a disease of the brain, as of the whole sympathetic nervous system. At one time the cerebro-spinal centres may be affected; at another the higher psychical centres. At times the vomiting centre may be the seat of irritation, the next attack may affect the vaso-motor centre. I shall not attempt to give the indications for the palliatives, or the radical treatment of this protean disease. By some it is believed to be of the same nature as hysteria, which defies all apparently indicated medicines.

I have found that better than drugs is change of place; any change of surroundings, both physical and social, is of more importance than change of climate. Yet this change may not effect a permanent cure. In a few years another change will become necessary. After the climacteric period in both men and women, *i. e.*, after the age of forty-five, nervous headaches usually cease.

A change of diet will often do wonders. Not because of any gastric causation, but because there is a change of food. Sufferers from cerebral neuroses or neuræsthenia generally eat but little fat;

they live on vegetables, fine cereals, and a little meat — generally dainty bits like lobster, soft-shell crabs and the like. Often they eat a great deal of sugar and various kinds of rich pastry. Now if you put such persons on a diet of bacon, fat mutton, butter, olive oil, nuts, and only bread enough to go with them, and if you oblige them to drink cocoa, or kola chocolate, and eat acid fruits, and pearled and granular cereals, you will see a wonderful improvement.

Each case must be studied; not only the paroxysm itself, but the whole history of the patient and his ancestors, his diathesis, and his mode of life. The treatment of his paroxysms has but little to do with the radical or constitutional treatment.

Those long-acting medicines which Hahnemann named antipsorics are those which we must rely upon as constitutional remedies. The palliatives have only a transient action. If the history of the patient convinces us that the attacks are epileptiform, the best remedies are bromide of gold, bromide of strontium, and bromide of nickel. These bromides can be continued in suitable doses for years without producing acne, mental depression, or any blood cachexia. The preparations of silver, zinc, and platina rank next to the bromides.

If the vaso-motor centre is chiefly affected, prescribe those medicines which give them tone and stability. The most appropriate are strychnine and its salts, ignatia, nux vomica, brucine, arnica, arsenic, nickel, cobalt, iron, zinc, and stannum.

Some chemical combinations of drugs form our best vaso-motor regulators and tonics, namely—arseniate of gold, arseniate of quinine, arseniate of iron, arseniate of strychnine, and arseniate of copper.

The best palliatives in vaso-motor headaches from arterial relaxation are amyl nitrite, glonoine, pauliana, belladonna, hyoscyamus, stramonium, agaricus, lachnanthes, selanum, pilocarpine, coffea, thea, ether, opium, and alcohol. All these act on the vaso-motor centre, dilating the blood-vessels, particularly the capillaries of the brain, and when used for this condition should be given in minute doses, not stronger than the 3x.

When the contrary condition, vaso-motor spasm with arterial contraction, is present, the same medicines should be given with physiological doses.

Many physicians find it difficult to account for the favorable ac-

tion of those popular compounds of bromides of potassium or sodium with caffeine, because it is well known that they are antagonistic. The bromides all contract the cerebral vessels, while caffeine in moderate doses dilates them. My opinion is that their combined action causes a normal equilibrium—one restrains the action of the other. This combination certainly acts as a palliative in many cases, but never cures.

Pauliana (or guarana) is a popular palliative in nervous sick-headaches. The powdered bark is given in doses of fifteen to twenty grains, in hot water, of the tincture ten to twenty drops every half-hour until the pain is relieved. It stimulates the vaso-motor centre, and when the face is flushed, the temples throbbing, and the pain in the head is violent, will often give prompt relief. Sipping hot or cold water also has a stimulating effect on these centres, and many patients cure their headaches by this simple measure.

Morphine is a medicine that will often give magical relief in angio-spastic headaches, when the face and extremities are cold, the pulse small, slow and feeble; a hypodermic injection of the one-tenth or one-fifth of a grain transports the patient from a hell of agony to a heaven of painlessness. But we should reserve this potent and dangerous remedy for cases that resist all other remedies. I frequently use it, out of sympathy, but I never tell my patients the true name of the drug. Call it by any other name than morphine. Thousands have become morphine victims by the incautious use of that drug. In both varieties of nervous headache phenacetin is a safe and prompt analgesic. I sometimes give five or ten grains at a single dose, but it is better perhaps to give the same number of grains of the 1x trituration every fifteeen or thirty minutes. Antipyrin, used in the same manner, will often give relief when phenacetin fails. Some recent experiments seem to show that solanine has very potent analgesic properties, and is also devoid of the injurious effects of the opium alkaloid, but it has not been sufficiently tested. All physicians are aware that when the paroxysms of violent pain have somewhat abated, there still remains enough to prevent the weary and worn-out sufferer from sleeping. It does not require much medicine to cause refreshing slumber. One-half a grain of bromide of camphor, ten grains of chloral, or chloralamide, ten to twenty drops of passiflora, or 1-500th of a grain of hydrobromate of hyoscine, will act like

water of nepenthe. I have seen sleep caused by the 1x of scutallaria and cypripedium in the same condition.

TOXÆMIC HEADACHE.

Definition.— Toxæmic headaches are caused by various poisons taken into the system, or formed therein. These poisons are carried by the blood to the brain, and cause painful sensations, coma, and convulsions. There are several varieties which I shall mention in the order of their importance.

(1) *The Headache of Fever.*— This is present in the fever of catarrh when the frontal sinuses are congested; the fever of la grippe and hay fever; in the fever of typhoid, and all the eruptive fevers. The pain is generally in the forehead and temples; it is of a dull, heavy character, and may be attended with vertigo, flushing of the face, and redness of the eyes. In young children it is very severe. In cerebro-spinal fever it is generally in the occiput. The poison of malarial fever causes headaches chiefly in the frontal region, but it may be in the occiput, or on one side only.

Febrile headaches are caused by an altered quality of the blood and elevation of its temperature in the cerebral vessels; or the presence of some specific poison in the blood, and the accumulation in it, also, of products of tissue change that are not eliminated by the proper channels. Violent and protracted headache in the beginning of enteric fever denotes an unusual severe inflammation of Peyer's patches and later hemorrhages.

These headaches are generally alleviated by medicines that reduce the temperature and the force of the pulse, namely: aconite, baptisia, gelsemium, veratrum viride, phenacetin, belladonna, etc. Phenacetin and antipyrin give palliative relief sooner than any other medicinal agents.

The headache of uræmia is due to toxic matters remaining in the blood when the kidneys are so diseased that their secreting tissues are impaired, and they are no longer able to separate the excrementitious matters from the blood. If the eliminating function is not restored, or if they are irreparably injured, drowsiness and stupor comes on and the patient dies from uræmic poisoning. Glycosuria and Bright's disease generally end in this manner.

When in the course of these diseases severe headache sets in, the bowels should be immediately opened by a quick-acting laxative. Croton oil and elaterium are often used with good effect. Then if the skin remains dry give jaborandi until it causes sweating, or resort to the vapor bath.

Give the patient some quick-acting diuretic, cream of tartar, ten to sixty grains in water, taken every hour until it acts upon the bowels and kidneys; or the infusion of digitalis taken at the same time, a teaspoonful every hour, when the power of the heart is flagging. If stupor or convulsions threaten apply cups to the back of the neck. When there is anæmia and anasarca Dr. Day says he has found the tincture of perchloride of iron with mercurius corrosivus of great service. (One-hundredth grain of the latter and five drops of the iron in a teaspoonful of glycerine and water equal parts every four hours.)

If the case is not so urgent we can get good effects from cantharis, turpentine, diuretin, apocynum cannabinum, apium vivus, eupatorium purpureum, asclepias cornuti, etc.

Headaches from carbonic acid and carbon di-oxide poisoning are caused by the air of school rooms, lecture rooms, theatres, and court rooms, when there is not adequate ventilation. In some of our fashionable club-houses the rooms are so filled with carbonic acid gas and tobacco fumes that many persons cannot remain in them an hour without a violent headache, immediately, or the next morning. I have had under my care many judges of the criminal courts of Chicago. During the winter sessions they suffered much of the time with headaches that nearly incapacitated them from work. The heart, too, became poisoned and they frequently fainted. There is no cure for such cases until their rooms are properly ventilated. Alcohol makes matters worse. Marchand's or any good peroxide of hydrogen, a teaspoonful in half a glass of water every few hours, is the best palliative remedy.

Arseniate of strychnine 2x, two grains three times a day, will restore the poisoned heart to its normal condition in a short time if the patient ceases to expose himself to the atmosphere of crowded and close rooms.

Sewer-gas headache is common in city houses when the plumbing and sewerage is defective. The victim of this poison wakes up in

the morning with occipital or frontal headache. He is stupid, languid; his mouth and throat are dry; he complains of a feverish feeling and has no appetite. No cure is to be expected until the drainage is renovated and properly ventilated. This headache is often contracted by breathing the gases emanating from street sewers, privies, and the air of a dissecting-room.

Dr. Day describes a headache which he says appears to arise from "the gas generated by putrefactive fæcal fermentation absorbed into the blood, thus producing its effects upon the brain and spinal cord."

His book was written before the discovery of ptomaines in imperfectly digested food and in the fæcal contents of the bowels. It is now known that the worst forms of headache and neuralgia are caused by the absorption of these ptomaines into the blood. It may be caused by fermenting food in the stomach, or a fæcal accumulation in the colon. The eructations are acid, acrid, and offensive. The colon will be found distended and hard, sometimes throughout its whole length. It is useless to give dynamic medicines before the stomach is emptied or its contents rendered aseptic. The colon, too, must be unloaded thoroughly. Then, to keep up the intestinal and gastric asepsis, give peroxide of hydrogen, arsenite of strychnine 2x or benzo-napthol (two grains, in chloroform water, every three hours). The diet of the patient must be regulated, one grain of papoid with five grains of sub-gallate of bismuth given with each meal.

The headache from *malarial poisoning* is generally periodic like the regular paroxysms of ague. If it occurs every day give quinine, cedron, or eupatorium perfoliatum; if tertian, arsenicum is the remedy. During the intensity of the paroxysm phenacetin is the best palliative.

The headache of cholæmia can be relieved only by restoring the secreting or excreting function of the liver. Euonymin, mercurius, chelidonium, chionanthus, and salicylate of soda are indicated.

The headache of gout and rheumatism require the treatment recommended for the two diseases.

Periosteal Headaches are nearly always syphilitic, and require mercury, iodide of potassium, aurum, stillingia, and corydalis.

Headaches of the Old require barium, zinc, phosphorus, and ergot. If the arteries are atheromatus, iodide of sodium, veratrum viride, glonoine, and cobalt.

The Headache of Children, when not caused by the toxic air of school rooms, is best treated by bromide of camphor, 1x to 3x, carbonate of calcium, phosphoric acid, zinc, iodide of ammonium, and phosphorus. It is generally caused by early "cramming" in schools, before the immature brain can meet the demand upon it. The child or young person should be taken from books and study, and made to live in the open air and indulge in exercise and amusements.

CEREBRAL-HEMORRHAGE.

This is one of the common results of severe active or passive congestion of the brain, especially if there are miliary aneurisms or atheroma of the blood-vessels. The results of course are apoplexy and paralysis. This is due to the rupture of a blood-vessel, with extravasation of blood either into the substance of the brain or into its ventricles.

In apoplexy there is loss of consciousness; in paralysis the mind, though impaired, is not suspended in its action.

The premonitory symptoms of apoplexy are those of cerebral congestion, to which are added difficulty of speech, partial paralysis of one side of the face, defect of sight (due to minute extravasation into the retinæ), bleeding from the nose, numbness of one side of the body; none of these symptoms need be present, the patient being struck down instantaneously with complete coma and insensibility. This sudden "stroke," however, can occur only when the brittle, atheromatous artery bursts, or a large aneurism is ruptured.

Many of the symptoms which precede apoplexy and paralysis also precede thrombosis of the cerebral blood-vessels. For a complete diagnosis and pathology of apoplexy, paralysis, and thrombosis I refer the reader to the works of Hammond, Hart, Baudry, and Gowers.

Treatment. — The treatment of the premonitory symptoms is fully given under "congestion." Preceding or during the actual attack little can be done. In a few cases I believe I have warded off attacks which would have soon occurred, by the bold use of the tincture of veratrum viride when there was present very *high arterial tension.* In several cases I have alternated glonoine 1c. with the

veratrum. This may seem strange treatment, but when it is considered that the rupture of a blood-vessel is in direct proportion to the amount of tension, especially if the vessel is atheromatous, or affected with fatty degeneration, the rationale will be apparent. The old practitioners were aware of this fact and resorted to bleeding to lessen this tension, and sometimes, it must be admitted, with decided benefit. As before mentioned, both Hammond and Weir Mitchell believe they have prevented attacks by the use of thirty grains of the bromide of lithium, or bromide of calcium, the action of which is more rapid than that of any other bromide.

During the attack Dr. Hammond declares "the less done the better,"—he alludes to the purging and bleeding often practiced on that occasion. He says there is no more use bleeding for a clot on the brain than a clot under the skin. One of his most eminent colleagues of New York City, however, recommends glonoine during the attack "to prevent further hemorrhage by opening the arteries, and allowing the blood to flow into them instead of out into the brain through the rupture," which I consider very good practice.

Hammond also ridicules the use of iodide of potassium, and properly too. There are two remedies, however, which should be given during the attack and for some time after, namely:

Carbonate of ammonium and arnica. The former in small doses increases the fluidity of the blood and prevents the formation of hard, fibrinous clots. The dose need not exceed one grain every two hours, and should be alternated with the tincture of arnica root, ten drops in four ounces of water, a teaspoonful every half-hour.

Arnica certainly possesses the power of hastening the absorption of the clot, and it has besides considerable influence in the prevention of bleeding from ruptured blood-vessels. It has also many symptoms like those preceding apoplectic and paralytic attacks. Dr. Peters in his monograph on apoplexy praises it very highly in such cases, and gives many instances in which it has prevented second or third attacks when taken continuously for weeks and months.

Baryta stands next in rank in the treatment during the period when the clot is being absorbed. It assists in its absorption and the removal of the consequences of the pressure. It is suitable to the old, feeble, and demented. The bowels should be moved every day for awhile after the attack to get rid of the accumulated fæces, or

we shall get ptomaine poisoning of the brain, added to the pressure. If an enema will not accomplish it give aloin at night, one-fourth or one-half of a grain. The treatment of the resultant paralysis by means of electricity, strychnine, or massage, should not be begun until all signs of irritation of the brain have disappeared, and the patient begins to feel the restraint of confinement, and tries to move the paralyzed limbs, which is soon after the eighth day; meanwhile we can use arnica, nux vomica, or ignatia in small doses (3x) which will allay rather than increase the irritability. In fact the judicious use of these medicines may, and often does, so favorably affect the paralysis that the heroic use of electricity and strychnine is not necessary. If, however, the paralysis does not improve during the month after the attack strychnine should be given in doses beginning with the one-hundredth of a grain (preferably by hypodermic injection), three times a day, increasing the dose every five days until decided improvement in motion sets in, or until the one-twenty-fifth of a grain is reached. If this does not succeed the phosphide of zinc 2x should be used in the same manner but by the stomach. I have succeeded by this method better than with the large doses recommended by Hammond.

"The recent advances in brain surgery gives us reason to hope for success by operative procedure in those cases in which the clots involve the cortex, or in cases of meningeal hemorrhage." (Hammond.)

The treatment of meningeal does not differ essentially from that of cerebral hemorrhage, although it would seem that bryonia might aid in preventing the meningitis which may follow the hemorrhage.

TUMORS OF THE BRAIN.

Little is known of the development of tumors in the brain and cord, and generally speaking they develop gradually and unnoticed in otherwise healthy persons. Sometimes the symptoms may arise soon after a fall, but even then it is a question whether the fall is really the cause of a tumor. Most tumors occur in adults, though the tubercular infection shows itself generally in children, and strange to say, men seem more apt to suffer than women. (Struempell.)

The various tumors may be distinguished as follows: Glioma,

sarcoma, syphiloma (gumma), tubercle, carcinoma, psammoma, lipoma, and angioma; of these gumma and tubercle are the most common, then come glioma, sarcoma, carcinoma (usually secondary), in the order named.

General Symptoms.— It must be recognized that symptoms will differ according to the location of the swelling, the diagnosis of which requires a careful study of cerebral localization, but all tumors exercise a certain pressure within the cranium which changes the form and the character of the circulation and function of the brain, demonstrable after death, and detected during life by a few very prominent clinical manifestations.

(1) Headache is one of the earliest and most frequent symptoms, and is as a rule constant, with occasional remissions or exacerbations; a dull, stupifying wide-spread headache, localized, if at all, at the seat of the tumor. A tap on the skull over the proper spot may show this seat. (2) Mental hebetude, a changed psychical attitude towards the world, characterizes the patient with a brain tumor. The expression is stupid, the speech becomes slow, and thought difficult, memory fails, and interest slackens; there may be at times loss of consciousness or even apoplexy. (3) Vertigo, a slow pulse, and vomiting are the other important symptoms; sudden and intense vertigo must draw attention to the cerebellum; a slow pulse means increased blood-pressure in the brain, and vomiting might be called almost essential. This vomiting is not from the stomach, but from the brain, and is without nausea, occurring on the ingestion of food, and often associated with the vertigo mentioned above. (4) Epileptic attacks do occur, and refer principally to involvement of the cortex, especially so if the fits are such as to warrant a diagnosis of localized interference only. (5) Optic neuritis is another great symptom; whether it comes from pressure and œdema, or from descending neuritis, or from vaso-motor irritation, is a matter that concerns the pathologist chiefly; the interest for us lies in the fact that optic neuritis is most always present. (The opthalmoscope must be used to establish this condition.) (6) Bodily weakness and a tendency to constipation may aid the diagnosis. To repeat, headache, vomiting with vertigo, and optic neuritis, all at once, will often assure the presence of a brain tumor. The discussion of the kind of tumor, and of its localization by means of

more refined symptoms, I must leave to special works on the subject. The development is gradual, the prognosis bad, and death comes in about a year, unless surgical means (iodide of potassium in gummata) can be resorted to.

Treatment can be only symptomatic. Iodide of potassium and mercury can be tried in every case, as syphilis may be present unknown to the patient. Otherwise, excision is the only hope.

Purulent Encephalitis.—I can only mention brain abscess here with a caution to suspect it when a few peculiar symptoms are present. As in brain tumor, there are headache and vomiting, but much seldomer any optic neuritis. If it runs a slow course, there may be no suspicion of the mischief till a sudden fever with brain symptoms appears; but as a rule, encephalitis is acute. It follows scalp or bone wounds, a purulent nasal catarrh, any of the infectious fevers, pyæmia, purulent bronchitis, empyæmia, but above all, caries of the temporal bone and purulent otitis should always engender the fear of a subsequent brain abscess. If after a chronic otitis there are sudden fever, with headache and vomiting, localized convulsions, a slow pulse and symptoms likened to purulent meningitis there can be little doubt of the diagnosis.

Treatment. — The patient may get well, but without an actual release of pus by trepanning, no one can tell whether or not it was an abscess.

ACUTE SIMPLE MENINGITIS.

Definition.—An inflammation of the soft membranes enveloping the brain (the dura, pia, and arachnoid). Inflammation may be limited to the convexity of the membranes, as in acute idiopathic meningitis; or it may attack the base, as in tubercular meningitis; or the dura may be the only membrane indicated, as in pachymeningitis.

The diagnosis of these different varieties is of considerable difficulty, but so far as treatment is concerned it does not matter essentially. The symptoms of acute hyperæmia are those of the onset of meningitis. There are a few points to which I will call attention. (1) That during the progress or even at the onset of acute pericarditis that disease causes symptoms so closely imitating meningitis that it is possible to diagnose only by examining the heart very care-

fully. In several instances I have been nearly led to diagnose meningitis, but was prevented by observing closely the pulse and respiration. On auscultation I discovered a pericarditis.

Pneumonia sometimes presents symptoms closely similar to meningitis. In cases of doubt always examine the apex of the lungs. If you find crepitant rales and dulness there the delirium is not from meningitis.

Rheumatism sometimes attacks the brain and causes a true meningitis. There are phases of typhoid fever when the symptoms are almost identical with meningitis. The only case of erysipelas I ever lost followed the sudden retrocession of the inflammation on the skin, and acute meningitis and death was the result.

Treatment.— There is nothing in old-school treatment that is worthy of our adoption; the use of ice to the head is cruel and unnecessary. The scalp is sometimes frozen by its use, and I believe the brain injured.

Statistics do not show any more recoveries from the use of ice than from other methods of treatment. The experiments of Dr. Buchan, of West Riding Lunatic Asylum, England, shows that cold applied to the head does not reduce the inter-cranial temperature or lessen the amount of blood flowing through the brain. Sponging the head with cool or warm water and fanning the head cools it just as effectually. Some patients are quieted only by the application of quite hot water. This is more rational than ice, for moist heat opens the external blood-vessels and may relieve the inter-cranial pressure.

Isolation in a cool, quiet, well-ventilated room is of the greatest importance. I allow all the water the patient wants, even if vomiting occurs, for the vomiting is cerebral and cannot be aggravated by drinking. During the inflammatory stage little or no food is needed. When effusion sets in the food may be more nourishing. In the third stage, even if delirium returns, alcoholic stimulants can be given with advantage, for it is a stage of depression. The medicines indicated in the first stage are veratrum viride, gelsemium, and aconite. I need not mention their specific indications, as they are well known, but I must insist that in order to get prompt results, to reduce the inter-cranial blood-pressure and the high temperature, each must be given in material doses until we get their physiological effects: namely, a reduction of the force of the pulse and heart's

action, and of the temperature. I know that less than one-tenth of a drop for an adult will not accomplish this end, and in infants less than the one-hundredth will not.

The dose should be repeated every hour until we see favorable symptoms. Not until this result is obtained should we use belladonna, agaricus, hyoscyamus, stramonium, or bryonia. Either of these latter can be alternated with one of the former, if it is considered best to continue them.

My experience induces me to prefer agaricus or stramonium 3x in the majority of cases. They, more fully than the others, meet the peculiar delirium.

When the pulse and temperature has lessened and the stage of effusion is approaching, bryonia is the chief remedy. Its action on serous membranes is specific. No drug is so homeopathic to the inflammation and effusion, no matter where it is located, in the joints, peritoneum, pleural membranes, or in the meninges of the brain. (I use the 2x.)

The iodide of potassium equals bryonia, but it should follow the latter if the effusion is not prevented or does not show signs of disappearance. The old school believes this drug to possess decided curative powers in this stage. Hammond, Flint, Lyman, and others value it highly. Hart does not mention it. Peters instances cases of supposed tubercular meningitis cured by large doses, but as this disease is considered almost incurable, it is probable that the cases were basilar meningitis with effusion. The doses used were ten to thirty grains three times a day.

The cases of poisoning by this drug would seem to show that it is homeopathic to this disease, but the indications are not so clear as could be desired. The old school bases its curative properties on its power of causing absorption of morbid products. I do not deny this power in some cases, but I have never seen such results in meningitis with effusion, yet it should be tried if other remedies fail. Especially should it be tried if there is a suspicion or actual knowledge of the presence of syphilis, or a metastasis of rheumatism.

Apis mel. has been found especially useful for children, where the attack has been sudden, and may have been preceded by erysipelas. The symptoms present a good picture of meningitis, with rapid effusion and very scanty urine.

Hellebore, so highly praised in all our text-books, seems to me to be greatly overrated. I cannot see why it should be recommended in the acute stage. Like veratrum album its symptoms point rather to the "hydrocephaloid state." I have never seen the slightest benefit from its use.

Opium is decidedly useful during the comatose period. It has no influence over the effusion or thickening, but it relieves the venous stasis and arouses the torpid circulation in the brain. In several cases I have seen surprising effects from morphine. The first case, a child of six years, in which I used it had stupor, convulsions, incontinence of urine and fæces, dilated pupils, and was pronounced incurable by several consultants. Owing to the restless motions of the child, its cries and moans, the parents desired the use of morphine. I had no hopes of the child's recovery. One grain was dissolved in four ounces of water, and of this a teaspoonful given every two hours. After two doses the patient slept quietly most of the time for twenty-four hours; partial consciousness returned; the morphine was continued every four and finally every six hours. The child recovered after a long convalescence. I believe the recovery was due to the morphine. Since that experience I have prescribed it on several occasions for the same condition, and have seen several apparently hopeless cases recover under it. One grain of the 2x (one-hundredth of a grain) is the quantity I have since used.

In the last stage, when the vital powers are very low, the brain paretic with coma, the arms, hands, and feet contracted, arsenite of copper has seemed to make the patients more comfortable and aid the action of opium.

Zinc has apparently rescued patients from impending cerebral paralysis. I did not have much success with it until I used the phosphide. Several of my correspondents in this country are enthusiastic in its praises. They, like myself, prefer the 6x trituration in this condition.

CEREBRO-SPINAL MENINGITIS.

Definition.— A malignant epidemic fever, characterized by profound disturbance of the central nervous system, ushered in by violent vomiting, agonizing occipital headache with delirium, alternat-

ing with somnolence or stupor; an acute painful condition, with spasm, sometimes tetanoid, of certain groups of muscles, especially the posterior muscles of the neck and those of the back; a general hyperæsthesia of the surface; a tendency to rapid disorganization of the blood, with petechiæ, purpura, or bloody vesicles. The fever is irregular with not very high temperature, and generally lowered arterial tension. After death there is found engorgement of the blood-vessels of the cerebral and spinal meninges, and inflammatory exudates beneath them. Although it is said to be epidemic by most authorities, sporadic cases do often occur. It is said to be non-contagious, yet Hirsch, Stokes, and Boudin cite apparent proof that it is portable and contagious. I have witnessed three epidemics. One in Southern Ohio, one in Michigan, and one in Chicago. I believe it is contagious as well as epidemic. I have also seen in Chicago and suburbs many sporadic cases. Its specific origin has not yet been discovered. It attacks rich and poor, the dirty and the clean, those in good health as well as the feeble. Children and young persons seem more liable to it than the middle-aged and old.

There are several varieties. Stillé says five; namely, abortive, malignant, nervous, inflammatory, and intermittent. Radcliffe has the simple, fulminant, and purpuric. It seems to me that there need be but three divisions, viz.: the *simple* or *mild*, the *malignant* or *purpuric*, and the *fulminant* or *collapsing*.

It is rare that high temperatures are seen, and the pulse does not denote acute inflammatory action. Yet it is a meningitis, when it is not purely congestive. Dr. Bedford Brown says there is a purely neuralgic type from which nearly all recover. The death rate is very high, varying from sixty to eighty per cent. The diagnosis is not difficult even from the first day. The only disease which it simulates at its onset is pernicious malarial fever.

The best and most complete article on this disease, in our school, was written by Dr. Arndt for his "System of Practice." It leaves nothing to be desired unless it is a more successful treatment, which, uncertain as it is, is more successful than that of any other school. I shall not criticise the treatment of anyone, but give my own experience and the best of both schools.

Treatment.—The symptoms and pathological changes in this disease are so varied that no one drug could produce a disease which

would be a *similimum*. Until we find such a remedy or remedies we must treat its manifestations as they arise.

If this disease commences with the symptoms of acute inflammation, high temperature, throbbing pulse and arteries, red face, violent occipital pain with vomiting, and if we see the patient as soon as these symptoms occur, I should hesitate between veratrum viride and aconite. If the pulse was hard, bounding, and quick, I would prefer veratrum viride, giving it boldly until the force of the heart is subdued, and the temperature lowered two or three degrees. This may be said to be antipathic; perhaps so, but I know it modifies the disease, and renders it less virulent. The action of the drug should not be continued too long or the heart's tonicity will be lowered. I think it is secondarily homeopathic, for in a notable series of experiments by H. C. Wood, the reaction from the primal effects were great arterial tension, high temperature, and tetanoid spasms. Give, of a good tincture, one to five drops every hour. If the patient cannot retain it inject it hyperdermatically, mixed with fifteen or twenty drops of boiled water.

Aconite would be preferable if the pulse is small and hard and the mental anxiety and physical restlessness very great; dose, five to ten drops of the 1x dilution, repeated every hour.

Belladonna is a valuable remedy if its well-known symptoms are present. It acts well after veratrum viride and aconite have modified the worst symptoms.

Solanum and glonoine are recommended. They resemble belladonna, and may be as useful in some cases. In cases which commence with collapse, like the "sinking chills" of pernicious fever, the treatment must be rigorous and immediate. Alcoholic stimulants are in my opinion utterly worthless. I never saw the slightest sustaining or reviving effects from them. Sipping very hot water acts better. The patient may be packed in sheets wrung out in hot mustard-water very strong, or surrounded in bed with hot bottles. But something besides internal and external applied heat is necessary.

Some drug that exerts a violent stimulating effect on the heart is required, or one that stimulates the heat centre in the medulla; these agents are as antipathic to the condition as is applied heat. The strict homeopathic remedy will not in my experience meet the

demands any more than it will in the collapse of pernicious chills. When we get the blood to circulating and heat restored to the surface, then arsenic, veratrum album, veratrum viride, and aconite are useful in *minute* doses.

Camphor is considered the best stimulant in collapse. But it is not primarily homeopathic; Hahnemann did not think it was, or he would not have used and advised drop-doses of a saturated tincture. It is not only an arterial but a nerve stimulant when the system is overwhelmed by some disease to such an extent as to paralyze the reactive powers. In the fulminating form of this disease when the collapse is sudden, camphor should be given in drop-doses (one to five) every fifteen minutes till reaction sets in. If this does not occur in an hour then the nitrites should be administered. Amyl nitrite is too evanescent, though a few whiffs may be inhaled; but at the same time glonoine or nitrite of sodium must be given to prolong the stimulation. One to five drops of the one per cent tincture is to be placed on the tongue. In five minutes, if the pulse does not get strong, repeat the dose. Its effects lasts from half an hour to an hour. Three or five grains of nitrite of sodium act nearly as quick but its action lasts two or three hours. Camphor does not antidote the effects and the two can be given together. Glonoine can be used hypodermatically; so can the nitrite of sodium, sulphuric ether, and brandy.

Atropine is a cardiac stimulant. When injected into the cellular tissue in doses of one-hundredth or one-sixtieth of a grain its effect is almost immediate. The heart beats harder and quicker, the face and body flush, and the capillary vessels are flooded. When reaction occurs and the disease commences its typical course the remedies appropriate to each manifestation must be used.

If the cerebral symptoms are prominent, belladonna, agaricus, solanum, hyoscyamus, and cannabis indica are indicated.

If the cerebro-spinal symptoms are predominant, cicuta, cocculus, agaricus, cimicifuga, manaca, and œnantha are useful. The symptoms of each are well known except those of œnantha. The symptoms of this drug collected in "New Remedies" are very similar to the cerebro-spinal spasms and convulsions of this disease. The pathological condition of the brain, medulla, and cord are similar. Besides, it causes epileptiform convulsions and trismus. It has been found

curative in epilepsy and cerebral spasms, and should be tested in this fearful disease. The dose need not be below the 3x or above the 6x attenuation. In the comatose variety, opium, hyoscyamus, and zinc are useful.

For the tetanic symptoms, nux, ignatia, and strychnine are strictly homeopathic in minute doses, while passiflora, calabar bean, and gelsemium, in large doses, have been found useful. Many physicians claim good success with calabar, especially in the epidemic in Chicago in 1868.

Ergot has also been useful according to old-school reports. It acts on the brain and cord by contracting the blood-vessels of the meninges, when given in doses of thirty to sixty drops of any trustworthy preparation. I used it thus in several cases and am sure it aided in the recovery of the patients.

Dry and wet cupping and the "vacuum" pump applied to the spine may draw away the blood from the cord and aid our other measures.

In the purpuric stage, although patients rarely if ever recover, crotalus is highly recommended by Dr. Neidhard, who wrote a monograph on the poison of that serpent.

Phosphorus is a favorite remedy for purpura, so are sulphuric acid and terebinth, but they are of doubtful utility in this disease, because the blood is so badly disintegrated and devitalized. Baptisia and arsenic may have a good effect in the petchial and low typhoid state.

In a few cases where the heart seemed affected I used cactus with undoubted benefit. Recent experiments show that cactus and its constituent, cactina, is a powerful cerebro-spinal as well as a heart poison. It is a direct irritant to the convulsive centre in the medulla. Another species of cactus, anhalonium, is still more powerful than cactus (cereus), and causes genuine tetanic spasms. The following are the indications for cactus: Heavy pains, like a weight on the vertex, worse from sounds, even talking; pulsative pains in the temples, intolerable at night; dimness of sight, circles of red light before the eyes; pulsations and buzzing in the ears; contraction in the throat and œsophagus, preventing swallowing; oppression on the chest, like a great weight, or as if the chest were compressed, with fainting, cold perspiration, and loss of pulse; sen-

sation of constriction around the heart, as if an iron band was around it; very acute pain, and such fearful stitches in the heart as to cause him to cry aloud, with distressing palpitation, faintness, dyspnœa, etc. (Pains everywhere—head, arms, legs, back, chest, heart; darting, springing like chain-lighting, terminating with a sharp, vise-like grip, only to commence again a moment afterwards, with restlessness and groaning.) This last symptom is a curative one observed by Dr. Lilienthal, and doubtless would be found pathogenetic in a full proving. This sense of constriction seems to affect all portions of the body. Dr. Farrington writes me that "a very intelligent lady, after taking cactus, felt as if her whole body was in a wire cage, and that each several wire was being twisted tighter and tighter. It causes tonic spasms of the limbs and muscles of the trunk, of a *twisting* character, rotating the body to one side or the other, aggravated by the slightest touch or jar.

The favorable effect of passiflora in all tetanic conditions makes it worthy a trial in the contractions and tonic convulsions of this disease. Its power over insomnia would indicate it, when the violent pains and restlessness prevent sleep. It is analgesic as well as hynoptic. It probably has a favorable influence over the congested circulation in the brain and cord. The dose should be a teaspoonful of the tincture, repeated every hour or two until some favorable effect is observed, or for six hours at least. It is very desirable that the active principle of this drug be isolated.

Chloral hydrate may be useful. Is not very useful for pain. It is a pure hypnotic, but there are times when the hyperæsthesia, which is so intense in this disease, prevents sleep, when no severe pain exists. If coffea, cannabis indica, or scutellaria fail, fifteen or twenty grains will give restful sleep of several hours. (Sulfonal or trional are useful in similar conditions.)

Phenacetin has the hypnotic action of chloral, though not to the same extent, but next to opium it is the most powerful analgesic medicine we know of. For the agonizing pain of this fever no other remedy is so safe and useful. Instead of giving one large dose, I prefer two or three grains every hour. I am not sure but that phenacetin will prove the best remedy for the real condition present in this fever. If it acts only as an analgesic, it places the patient in a condition favorable to sleep; and a great deal will be gained. It

is not pathologically indicated in meningeal inflammation with effusion of lympho-purulent exudation, but acts as a sedative to the spinal cord.

Drugs that cause a nearly similar condition should be used in this disease in order to test their merits. Æsculus, gymnocladus, guaco, oxalic acid, and œnanthe are worthy our consideration.

The diet and hygiene of this fever may be summed up in a few words. The patient must be kept absolutely quiet, owing to the extreme hyperæsthesia of the nervous system. All visiting, talking, or strong lights should be banished, and all noise excluded. In a city the streets in front of the house should be strown with tan-bark or shavings. The room should be well ventilated and its constant temperature about 75°. The diet should be milk, butter-milk, koumiss, meat broths, and milk gruels. In most cases alcohol seems necessary. In the epidemics of 1865 and '78 some physicians throughout the West used pure alcohol in preference to any other form. They asserted that the greatest success attended those physicians who hyper-stimulated their patients with alcohol. It was given largely diluted with water, and the amount taken daily was from one to four ounces; the patients were also bathed with alcohol in hot water. Per contra, Dr. N. S. Davis, of Chicago, treated all his cases without resorting to alcohol, and claimed that his success was better than the average. I am in favor of using strong tea, kola-chocolate, coffee, and perhaps cocoa, or coca, if the patient can be made to drink them.

The convalescence is often long and tedious, owing to the slowness of absorption of the lympth and pus thrown out by the meningeal inflammation. So long as this exerts a pressure on the cord, so long shall we have contractions, paralysis, and other symptoms of irritation. To assist nature in absorbing these products, we must use the iodide of potassium, which has acted beneficially. Perhaps the iodide or chloride of barium or phosphide of zinc will be better adapted to certain cases. Ichthyol possesses powerful resolvent properties, and may be of benefit internally in doses of two grains (in pills or capsules) three times daily, and at the same time an ointment of the same, twenty-five per cent in vaseline, rubbed into the spine several times a day.

The diet during convalescence should be very nourishing, consisting of eggs, fat, tender meats, egg-nog, Tokay wine, etc. Children who do not take solid food should be fed every three hours with Mosquera's beef meal, Chapman's raw-beef blood, Valentine's meat juice, and if emaciated, Baker's peptonized beef and cod-liver oil, together with the farinaceous and glutenous foods prepared by the Health Food Company of New York. Rectal alimentation has to be resorted to in some cases, as well as forced feeding by means of the stomach pump.

SPINAL HYPERÆMIA (CONGESTION).

Definition.— Spinal congestion may be acute or chronic, active or passive, as described under cerebral congestion. Unlike spinal anæmia, all the symptoms are aggravated by the recumbent posture. The pain is dull and aching, similar to that caused by long stooping. If the lower portion of the cord is congested, the pain is increased by standing. A sudden blow or shock aggravates it. Pressure steadily applied is not painful. There are disturbances of sensation and motion in the extremities below the seat of congestion. Anæsthesia or hyperæsthesia may exist. There is always a sensation as if a tight cord was bound around the body or limbs. There is partial paraplegia, partial loss of expelling power in the bladder, and incontinence of urine from paralysis of the sphincter. Both conditions may exist; then the urine, collecting in a bladder that is never empty, becomes fœtid and amoniacal and dribbles away. The rectum is similarly affected. The paralysis often extends all over the body. It is sometimes difficult to diagnose spinal congestion from spinal anæmia, yet there are certain symptoms, like formications, pricking, tingling, and anæsthesia, in the former, which are not in the latter. I have met with two cases which were caused by lying on the damp ground, one from sitting several hours on a cold stone door-step, two from excessive muscular exertion, one of which was a child forced by its drunken father to walk six miles in a muddy road. The next morning the little boy was found to have complete paraplegia, with involuntary passage of fæces and urine.

Treatment.—If it occurs from a sudden chill, a cold rain drench-

ing the clothing, sitting or lying on cold damp ground, the patient should be put in a mustard bath until the external blood-vessels are full, then wrapped warm in bed, and rhus tox. given. If reaction cannot be fully brought about, give ergot or hydrastis in large doses, twenty to thirty drops every three hours. This method cannot be called homeopathic, but mechanical or physiological. The action of both drugs, when given in such doses, is to contract the blood-vessels in the spinal cord. This fact has been established by numerous experiments. Hammond and Brown-Sequard consider ergot to be indispensable in both acute and chronic cases, and they give abundant clinical proof of its efficacy. In two cases I had good effects from hydrastis.

Another physiological remedy is belladonna. It is not generally known to our school that while belladonna dilates all the external arterioles of the body, it contracts at the same moment those of the spinal cord. It has the same action as the hot mustard bath, and cannot be primarily homeopathic to spinal congestion.

I have treated many children with undoubted symptoms of spinal hyperæmia where the body was cold. In such cases one or two drops of the tincture given every two hours caused no other symptoms than those of rapid improvement. In local lumbar congestion a belladonna plaster applied to that region is of great value. The hot douche, the water at a temperature of 100°, poured from a height of two feet upon the naked back, has been of signal benefit in many cases. Chapman's ice bag is a powerful means of contracting the vessels of the cord. Great heat and great cold act alike.

The most useful homeopathic remedies are phosphorus, nux vomica, and ignatia, which should not be prescribed lower than the 3d. I think I cured two cases with strychnine 6th.

Cannabis indica, rhus, and arnica are useful when the congestion has been caused by prolonged, violent exercise.

Æsculus hippocastanum and glabra are both indicated when the congestion is at the lowest portion of the cord.

Oxalic acid is a special spinal remedy. Its effect is to paralyze the vaso-motor, respiratory, and spinal nerve centres. It is a cardiac poison, arresting the heart in systole. A study of its pathogenesis will show it to be indicated in congestion with paralysis.

SPINAL-ANÆMIA.

(SPINAL IRRITATION, SPINAL NEURÆSTHENIA.)

Definition. — A deficiency of blood in the spinal cord, or a depraved state of the blood circulating in the cord. Hammond teaches that the condition known as spinal irritation is an anæmia of the posterior columns of the cord; while such disorders as reflex paralysis, inhibitory paralysis, spinal paresis, paralysis from peripheral irritation, are caused by anæmia of the antero-lateral columns. Hamilton thinks many of the symptoms belonging to both may be caused by *hyperæmia.* Both may be right, for passive hyperæmia will cause about the same symptom as anæmia wherever those conditions are located. At first sight it would seem that too little blood in nerve tissue would cause absence of pain instead of hyperæsthesia, but the fact is that an anæmic nerve is a painful nerve. Someone has said that "neuralgia is the cry of a starving nerve." Now a nerve is starving when there is not blood enough supplied to it, or when the blood which is supplied is loaded with poison, or when the blood flows sluggishly through it. Hammond is the great champion of the anæmia-theory, and the majority of neurologists are now inclined to his teachings.

To define spinal irritation, or spinal neuralgia, we can say that it is characterized by a hyperæsthetic or morbidly sensitive condition of a greater or less portion of the spinal column, and by sentient or motor disturbances in one or more of the organs and regions to which the nerves proceeding from the affected parts of the spine are distributed.

Tenderness of the vertebræ is the most prominent local symptom. This is considered characteristic of anæmia of the posterior column. There is a pain in the cord developed by pressure or percussion, which should be distinguished from the external tenderness on pressure.

The symptoms caused by spinal anæmia in distant parts of the body are important, for those painful symptoms are the ones most complained of and so often mistaken for local disease. For example: when the cervical region of the cord is affected the symptoms are vertigo, headache, noises in the ears, disturbances of vision, fullness and a sense of constriction around the forehead, and tenderness of

the scalp. The mind is affected in various ways, from melancholy to paroxysms of insanity. Insomnia is common. Neuralgia of the head, face, neck, etc. Spasm of the face, twitchings, contraction of the neck and arms, paralysis of the arms and hands, aphonia, chorea, hiccough, and even nausea and pain in the stomach are protean symptoms.

When the dorsal region is affected the symptoms of the stomach are all very prominent. There are also palpitations, oppression of the chest, irregular action of the heart, with fainting, dyspnœa, and cough, inter-costal neuralgia, pseudo-angina, and infra-mammary pain. Paralytic chorea and epilepsy may be present.

When the lumbar region is affected there are neuralgic pains in the lower extremities, the back, and abdomen; spasm of the neck of the bladder, dysuria, or incontinence of urine; and also pain in the uterus, ovaries, testicles, and rectum. There may be either tonic contractions or paralysis of the lower extremities; also clonic spasm, simulating chorea.

I have mentioned these various symptoms for the reason that when they are met with in women, especially, and are not removed readily by medicines having an affiliation for the organs and tissues which seem affected, we *should examine the spine for tenderness and pain*, and if they are evoked, we should direct our remedies to the removal of the anæmia of the cord. I doubt not that we lose much time and fail to cure many patients because we do not properly diagnose the cause of disease. We may select medicines which seem perfectly indicated by their symptoms, but they do not cure because they are not homeopathic to the cause of those symptoms.

Treatment.— When the physician has fully decided that spinal anæmia is the cause of the symptoms of his patient, he should first remove the *cause* of the anæmia if possible. Then he should strive to improve the quality of the blood, and increase the quantity supplied to the spinal cord.

If the patient's environment is bad it should be changed. The food should be highly nutritious, the clothing warm and suitable, and in some cases good wine, malt liquors and other stimulants should be given in moderation.

In the treatment of spinal irritation it is of the utmost import-

ance that we ascertain if there be any reflex causes of the abnormal condition of the circulation in the cord. When we have eliminated malaria, impoverished or poisoned blood, we should carefully examine the outlets of the body—the uterus, cervix, vagina, urethra, and rectum—for constrictions, foreign growths, ulcers, or any local irritating causes. It is now well known that such outlet-irritations cause great aberrations of the capillary circulation in all the organs and tissues. They may cause vaso-motor spasm, transient or persistent, of the peripheral arteries in the spinal cavity; and until they are removed we cannot expect permanent improvement from any mode of treatment. The treatment of such local irritation will be referred to in another place. The medicines in both schools, *i. e.*, with those physicians who make a good diagnosis, are the same. All agree that nux vomica, ignatia, arnica, strychnine, brucea, and phosphorus are the principal ones indicated. Now it is a curious fact that all these medicines, when given in doses sufficient to be of benefit, *cause congestion of the spinal cord.* The old school claims that they act antipathically, or physiologically. What does our school say about it? They must either admit that they do act antipathically or accept my theory, that they are *secondarily* homeopathic. If they must select remedies which are *primarily* homeopathic they must go to other drugs. The one typical primarily homeopathic drug for spinal anæmia is ergot, yet no homeopath has ever selected it or cured a case with it. I believe that all the drugs mentioned above, while they cause congestion of the cord by their primary action, induce anæmia or passive hyperæmia by their secondary action; and, as I have previously mentioned, both the latter conditions may cause all the symptoms of spinal irritation. The secondary effect of a drug is *always* the opposite of its primary. But we cannot cure secondary effects by means of minute doses. We must give enough to cause or imitate normal physiological action. We cannot cause a normal spinal circulation with strychnine 200th or 2000th, but we can with the 3d. I do not approve of the large pathogenetic doses advised by Hammond and others, but I know we must use sufficient medicine to bring about a normal condition and *no more.* Nux vomica and ignatia contain strychnine — the typical remedy. Of this the 1-25th of a grain is the maximum dose, and

the 1-1000th the minimum. The others should be given in the tincture or 1x dilution—one to ten drops as the case may demand. (Arnica is useful in the same conditions.)

I cannot give all the symptoms indicating this group of remedies; that must be left to the physician, but I will give as a general indication that they affect the *whole* cord, and not one particular region. Phosphorus, phosphoric acid, the hypophosphites and the phosphides, all affect the whole cord, but they affect the sensory and trophic more than the motor nerves. Hammond claims the best results when he uses the two in combination. One of his favorite mixtures is strychnine and phosphoric acid: one grain of the former to one ounce of the latter, of which the dose is one to ten drops three times a day. Another is phosphide of zinc with nux vomica, one-tenth of a grain of the former with one-half of a grain of the extract of the latter in a pill, three times daily. I have used these preparations for many years, and can confirm his good results. I suspect the zinc has but little to do with the cures, unless it acts as a sedative to the nerves, for zinc acts on the cord as it does on the brain. It causes anæmia therein, and is thus homeopathic. Hammond praises the oxide of zinc as a "tonic" in such cases. I have found the cyanide of zinc to be more useful. It has great control over those neuralgias of the stomach and heart so often met with in spinal irritation.

Quinine primarily causes congestion of the cervical region of the cord, as well as of the brain, and cures many of the symptoms mentioned as caused by anæmia of that region. A few grains of the 1x or 2x are quite sufficient for this.

Cimicifuga is one of our most potent remedies in spinal irritation, especially when the lumbar region is most affected. This, too, acts primarily as a congestive drug. Cures have been made with doses ranging from fifteen drops of the tincture to the 1x, or the 1x or 3x of cimicifugin. (Macrotin.)

Francesca uniflora (manaca) is a useful remedy next to cimicifuga. It affects the cervical and lumbar cord. When the sufferings imitate rheumatism and constant headaches, it cures promptly in small doses of the tincture.

Gymnocladus and cannabis indica should be studied, as both may be very useful. The late Dr. Farrington cured a group of symp-

toms with tarantula 200th which may have been due to hysteria.

Turnera (Damiana) is useful in spinal irritation with passive anæmia. "Though slower in action, it is analogous to strychnine in effect, cases of poisoning by damiana exhibiting like tetanic convulsions, which are amenable to the same treatment as avails in cases of strychnine poisoning. The active principle of damiana, when given in therapeutic doses, seems to effect chiefly the spinal and medullary centres, not so much as a stimulant to their functional activity as by promoting the nutrition of the exhausted ganglion cells — inducing the tired and irritable cells to assimilate the nutriment offered them. For this reason, though slower in action, it is more tonic than strychnine. On the bowels, it acts to promote increased peristalsis, causing one or two mushy stools per day, and it is an effective remedy in the *habitual constipation* of neurotic subjects, especially those who are victims of sexual perversion. Increased diuresis follows its use, and many cases of irritable bladder and urethra are very greatly benefited by it. On the heart, also, it acts as a tonic sedative equal in some cases of functional disturbance to cactus grandiflorus. From the above *resumé*, it is plain why damiana has proven so efficacious in cases of nerve-exhaustion resulting from sexual excesses, and why, far from being a direct stimulant of erotic desires, it has been found to act as a sedative to abnormal sexual appetite."

The dose should be graduated from one grain of the extract—or one drop of the tincture—to the 3x dilution.

Hot water and hot bags to the spine have been found useful. So are all the forms of electricity. Prolonged rest on the back is advised in order to keep the spinal blood-vessels full. Local irritation by means of plasters of peppers or mustard give temporary relief, also dry-cupping, the flesh brush, and galvanic brush. Dr. Weir Mitchell's treatment by rest, isolation, and feeding must be resorted to in bad cases.

Bartholow, who has studied the action of gold, says it dilates the arteries of the brain, kidneys, and probably all the arterioles. Its symptoms show that such must be its effect. It relieves the tension of the blood-vessels in the kidneys in dropsy, acting as a diuretic. I believe we shall find in gold a most efficient remedy in spinal anæmia, particularly when it is caused by vaso-motor contraction, or any local disturbance. A study of its pathogenesis will show many symp-

toms which belong to anæmia of the cord. Primarily it causes hyperæmia of the cord and brain, therefore it should be used in the lower triturations. The chloride of gold and sodium is the best preparation. Glonoine acts as gold does, but in a more rapid manner.

Douching the spine with alternate hot and cold water appears to have a good influence both in anæmia and hyperæmia of the cord. It should be applied morning and evening for several weeks.

Dr. Elb, of Dresden, considers mikania guaco a remedy for spinal irritation due to spinal anæmia or passive hyperæmia. He gives minute indications derived from its provings and clinical use. These will be found in my "Symptomatology of New Remedies."

NEURALGIA.

Definition.— "Neuralgia," says Anstie, "may be defined as a disease of the nervous system, manifesting itself by pains, which in the great majority of cases are unilateral, and which appear to follow accurately the course of particular nerves, and ramify sometimes into a few, sometimes into all, the terminal branches of those nerves. These pains are usually sudden in their onset, and of a darting, stabbing, boring, or burning character. They are at first unattended by any local change or any general febrile excitement. They are always markedly intermittent — at any rate at first. The intermissions are sometimes regular and sometimes irregular. The intermissions are distinguished by complete, or almost complete, freedom from suffering, and in recent cases the patient appears to be quite well at those times, except that for a short time after which the painful nerves remain sore and tender to the touch. In old-standing cases, however, persistent tenderness and other signs of local mischief are apt to be developed in the tissues around the peripheral twigs."

As to the causes of neuralgia, I believe, with Anstie, that "it is universally the case that the condition of the patient at the time of the first attack is one of debility, either general or special." There may be a delusive mobility and exaltation of the higher nervous system, but that is no sign of real nervous tone.

In all old, inveterate neuralgias there will be found painful spots

where the affected nerves pass from a deeper to a more superficial level, or when they emerge from bony canals. But in the early stages they are not present. Pressure may be grateful to the affected nerve. Painful spots are equally present in myalgia. In neuralgia there is nearly always an instability of the vaso-motor system; patients are liable to sudden changes of vascular tension. At the commencement of a neuralgic pain there is some arterial tension in the part, which may be cold; but after it has lasted some time, heat and a dilatation of the vessels may obtain.

Neuralgia may be traumatic. It may be caused by direct injury to the nerve trunk by external violence, cutting, bruising, the pressure of a tumor, or ulceration. It may be caused by a shock, as by a fall, a railway collision, which gave a jar to the central nervous system, or by a severe mental emotion acting on the same part of the organism. The fifth cranial nerve is more prone to become neuralgic from this kind of shock than any other.

Dr. Anstie divides intra-nervous neuralgias into five divisions. (1) Malarious. (2) Those at the period of bodily development. (3) Those of the middle period of life. (4) Those of the period of bodily decay. (5) Those associated with anæmia and mal-nutrition.

With the exception of the first and last, these divisions are not practical, although Anstie's explanations of their various manifestations are very interesting.

Malaria, as a cause of the most inveterate and distressing neuralgias, is well known to all American physicians, and their cure sometimes cannot be accomplished except by a radical change of climate.

Anæmia and mal-nutrition are conditions that may be present at all periods of life, from infancy to old age. I believe they cause four-fifths of all neuralgias, outside of those of malarial origin.

Closely allied to anæmia and mal-nutrition, and often a cause of those conditions, is a condition of the blood designated toxæmia. This condition is induced by the entrance into the blood of mineral or vegetable poisons, such as mercury and arsenic, or nicotine, caffeine, morphine, etc., or the poisons generated in the human body, or in the bodies of animals, the meat of which is eaten by the human race. They are called ptomaines, and many of them are violent poisons to the nervous system, closely simulating in their action the most virulent mineral and vegetable poisons.

Of late much attention has been called to these toxic products, as a cause of inveterate neuralgias. They are generally formed in the contents of the alimentary canal, but often in the liver, spleen, and kidneys.

General Treatment.— Before considering the local varieties of neuralgia, I shall discuss the treatment of the three general divisions, malarial, anæmic, and toxæmic.

Malarial Neuralgia, particularly the acute, must be treated according to the directions laid down under "Intermittent Fever." As I mentioned in that article, it will assume almost innumerable forms, imitating all the local varieties, and even various local neuroses and inflammations.

If the patient has been exposed to malaria or lives in a malarious region we may safely treat his neuralgia as malarious, especially if the attacks are periodical, no matter what nerve or organ may be affected. The chief remedies are cinchona, quinine, arsenic, cedron, gelsemium, natrum muriaticum, alstonia, eucalyptus, and sulphur, but in chronic cases, nothing but a removal, temporary or final, to a non-malarial region will permanently cure. Usually one or two seasons, *i. e.*, one or two summers spent in the mountains, or in a northern climate where malaria is not known, will confer immunity from future attacks.

Neuralgias from Anæmia must be treated mainly by hygiene, and good blood-making food. The surroundings of the patient must be healthy; his or her residence must be in such a condition as to supply pure air and pure water. The food should be highly nitrogenous. "Pain," says Romberg, "is the prayer of a nerve for healthy food." If the anæmia is from malaria, follow the directions above; pure air will soon remove it. If from syphilis, the iodides of potassium and mercury will cure it. Stylingia syl. is also a remedy of great value in syphilitic cases. (See Keyes' experimenting on their blood-making power.) If from cholæmia, make the liver eliminate bile pigment from the blood. If from absolute loss of blood by hemorrhage, give china and the mineral acids. If good food is not properly digested give nux vomica, strychnine, helonias, hydrastis with pepsin, papayotin, papoid, or pancreatin. Add some preparation of iron to enable hemaglobin to be made from assimilated food.

Good digestible meats and meat broths should be the staple food.

Some farinaceous food, as gluten bread made from cereals, should be added. Fruits should be eaten in moderation. Instead of iron in officinal form, those spring waters which contain iron in combination with alkaline salts, with sulphur or arsenic, are preferable; the Columbia spring of Saratoga; the Chalybeate spring at White Sulphur, Va.; the Excelsior iron spring of Missouri; the iron springs at Hot Springs, N. C.; the Pyrmont spring in Westphalia, or the Putnam spring in New York; the Anderson and Chalybeate springs at Bedford, Pa.; and the many iron springs in Illinois, Wisconsin, Colorado, Utah, and California, are suitable; but the patient should not visit iron springs unless they are in a healthy region.

If toxæmia is the cause of the neuralgia, our aims should be to see that all the excretory functions be made to act normally. The skin should be kept clean and active. The stomach made to digest food normally. The bowels should be kept active, in order that all waste products are carried off as soon as formed, and that no portion of the digested food containing toxic products in the intestinal canal be absorbed. At one time it was claimed that purgatives would cure nearly all cases of anæmia. By anæmia was meant impoverished blood from mal-nutrition. Such treatment was very successful for no other reason than that the waste of the food was carried out of the body before the ptomaines and leucomaines were absorbed. We need not use purgatives, but we should keep the bowels open every day by suitable food and simple laxative medicines.

The local varieties of neuralgia may be divided into (1) Superficial; (2) Visceral.

Superficial Neuralgias are subdivided as follows: (a) Neuralgias of the fifth nerve, namely, supra orbital, palpebral, nasal, occular, and trachlial; (b) cervico-occipital; (c) cervico-brachial; (d) intercostal; (e) lumbo-abdominal; (f) crural; (g) sciatic.

Treatment.— There are some medicines, like arsenic, that seem to be useful in all neuralgias. Others which seem adapted to certain local manifestations.

Arsenic and quinine may be useful in all the above if they have a malarial origin and occur periodically.

Belladonna (or atropine) and aconite are particularly useful in neuralgias of the fifth pair of nerves. The former when there is arterial fullness, throbbing, with red flushed face, twitching in the

parts affected, blood-shot eyes, delirium, shooting pains, dimness of vision, photophobia, full pulse, and coldness of the feet. If belladonna is given, the 3d or 6th will often act magically; if atropine, the 6th trituration is applicable.

Aconite is almost specific in trifacial or trigeminal neuralgia when the pain is agonizing, with great anxiety, restlessness, and the patient is almost frantic with the pain. The face may be red or pale, but the pulse is generally quick, hard, and small.

Aconitine (crystalized) is considered by many greatly superior to the tincture in the treatment of violent congestive neuralgias. It is a powerful poison and must be given with caution. Begin with a grain of the 3x (one-thousandth of a grain), which can be repeated every hour. Aconitine is now prepared in granules of the 1-500th and 1-250th of a grain. One of these can be given three or four times a day. If the patient complains of numbness and tingling in the face and hands, with relief from pain, the medicines should be suspended.

Spigelia is equally useful if the left side of the face and the left eye is the seat of the pain. The pain is often located principally in the eye-ball, and the upper lid droops and twitches; even if both eyes are affected it is still the remedy. Sometimes the heart is at the same time affected with stitching pain and violent palpitation. Trigeminal neuralgia is sometimes called migraine or true "sick headache." It is so named because it generally ends with vomiting, not because it originated in the stomach, for the vomiting is a reflex symptom.

If aconite, belladonna, or spigelia fail to cure, we have in sepia, sanguinaria, and pulsatilla excellent remedies if their symptoms correspond with those of the attack.

But migraine is often very intractable, and the above medicines will all fail. We are sometimes forced to use palliatives, even if we desire to give the true similimum during the interval between the attacks.

A new group of palliatives has lately been introduced—the chemical synthetic drugs so popular at the present time. Among the most important are phenacetin, antipyrin, acetanelid, exalgin, etc.

I have tried them all. They are uncertain, and some dangerous or unsafe in their action.

Phenacetin is the safest and most valuable, and I do not hesitate

to use it in violent, acute cases. Having no provings, it must be used empirically. The dose ranges from five or ten grains of the 1x to five or ten grains of the crude drug. No two patients require the same dose. Begin with the smallest, and if no alleviation is obtained in an hour, double the dose. The maximum dose is twenty grains, but this quantity will rarely be required, and it is not best to increase it. The only unpleasant symptom I ever saw from this drug was profuse sweating.

Antipyrin in smaller doses, not exceeding ten grains, is useful when belladonna, though indicated, does not relieve.

Antifibrin (acetanelid) in doses not to exceed five grains, sometimes acts happily. Exalgin has been highly praised, but I never obtained good effects from it. It is an uncertain drug, and in small doses, one-fourth or one-half of a grain, has often given rise to unpleasant symptoms.

Some varieties of migraine are called "angio-spastic" because the arteries in the parts affected appear to be constricted, and at the same time the face and head are cold and pale. Relief is obtained as soon as the blood returns to the closed vessels. Aconite, veratrum album, or arsenic are homeopathic to this condition, and often give quick relief, but not always. We are then obliged to use antipathic or physiological remedies—those that will relax the vaso-motor spasm. Alcohol will do this; a glass of champagne or whisky is often effectual; but nitrite of amyl, glonoine, or any other nitrite, acts more quickly. Homeopathically they are useful in just opposite conditions. Dr. Hering first recommended glonoine in headache due to vaso-motor paralysis when the temporal and other arteries and capillaries are full almost to bursting, but when thus indicated the 3d is the proper dose.

In chronic migraine we cannot expect to cure unless we give the appropriate remedy for months during the intervals between the attacks. I have cured a few cases with sulphate of nickel, giving one-tenth of a grain three times a day. Others have been cured by the bromide of gold or the chloride of gold and sodium, in doses of one-sixtieth and one-hundredth of a grain three times a day. In a few cases I found these doses caused some pathogenetic symptoms, but a good cure was made. In very sensitive patients the 3d trituration or even the 6th will cure. I rarely use the bromides of potas-

sium or sodium except in cases of acute congestive neuralgia, when they sometimes give immediate relief, or when great nervousness and sleeplessness follow an attack. A single dose of twenty grains is sufficient for this purpose.

Caffeine is a favorite remedy with some practitioners. A cup of strong coffee (which contains a grain probably) will often relieve a case of migraine. I have had very good results from two-grain doses of the 1x of the citrate when the patients did not drink coffee.

A very popular preparation is a combination of caffeine with bromide of sodium or potassium. The use of it has been abused, and has become a habit with many women who resort to it when even threatened with pain in the head or sleeplessness. Its use should not be encouraged, as it prevents us from making permanent cures with other and appropriate medicines. It is as injurious to some persons as the habitual use of alcohol or opium.

Acute neuritis is often mistaken for neuralgia of the fifth pair. I remember one notable case in a man of fifty. The first few days the pain seemed purely neuralgic. It affected the right temporal region, the eye, and region of the eyebrow. Neither aconite nor belladonna arrested it. Then an erysipelatous swelling and great heat of the parts appeared, followed in a few days by a herpetic eruption on the affected parts, and on the eyelids and eyeball. There were several pustules on the cornea. Rhus and mezereum were prescribed, but did not prevent injury to the lower lid, which became everted; but thanks to the skill of the late Dr. Woodyatt the sight was not permanently injured. One of the most intractable cases of facial neuralgia I ever treated was cured promptly in a very heroic manner, after lasting several weeks and defying all apparently indicated remedies. I called my father, an old physician, to see the case — a woman of forty or fifty. After hearing the history he observed that the tongue had a dirty brown coat, the breath was offensive, and the skin slightly jaundiced. He suggested ten grains of calomel. It was given and caused purgation with immediate disappearance of the pain, which did not return. This case was probably caused by cholæmic poisoning. Since then I have cured several cases in the same manner.

There are other remedies which are useful in this kind of neuralgia. Chelidonium has cured many when the pain appeared about

noon every day. Iris versicolor, carduus mar., chionanthus, and euonymin are often indicated. Salicylate of sodium is a powerful hepatic as well as a rheumatic remedy. Gelsemium has an elective affinity for the lower maxillary branch of the trigeminus, especially if the paroxysms are periodical. The dose of gelsemium should be carefully selected. I have found in some cases that no impression was made on the pain until enough was taken to cause slight dimness of vision and heaviness of the eyelids. In most patients a drop or two of a good fresh-root tincture, repeated every hour, will cause those symptoms.

One of our indigenous plants, the passiflora incarnata, is gaining an empirical reputation for the cure of neuralgia. It grows in the Southern States, and has had a local celebrity for nearly fifty years for curing tetanus in men, women, children, and horses. It is successful in obstinate insomnia. Many cases of neuralgia have been promptly cured by it. A recent writer says: "In pure neuralgia its effects, in five or ten-drop doses of the tincture are often wonderful. Two cases will illustrate this: A working-man had suffered from neuralgia for a week, and his face was almost raw from the external applications made to effect relief. Two five-drop doses of the tincture relieved the pain inside of half an hour, and there was no return. The cure was complete.

"Another case was of a woman who had suffered from neuralgia for three months, and had been under professional treatment during that time, but with no relief. Passiflora, in ten-drop doses, relieved and cured in a remarkably short time. In the liquor and morphine habit, passiflora, in half-teaspoonful doses, has done wonders. Let patients abstain from the liquor or morphine as long as they can. When the desire becomes irresistible, then take the passiflora, and the effect will be to soothe the nerves and induce, often, a sweet and refreshing sleep."

We have no provings of this plant, and its exact position in our materia medica is yet uncertain. No pathogenetic symptoms have been observed from its use, even when large doses have been given.

A rare form of prosopalgia is called by Trousseau, *tic epileptiform*. This is a most intractable malady, and in a majority of cases no cure can be effected except by surgery. The affected nerve can be stretched, or a portion taken out, resulting sometimes in a cure,

or temporary relief. I have treated six cases, not one of which was cured—two had the nerve stretched and in one a portion of the nerve was extirpated. No medicines gave even temporary relief except morphine and atropine by hypodermic injection. I did not try aconitine hypodermically, but its use in other hands has not been successful. If used, only 1-500th of a grain should be injected. Theine has been suggested. A brief item in a recent medical journal stated that hyoscine had cured a case even after nerve section failed. The reporter's name was not given.

CERVICO-OCCIPITAL NEURALGIA.

This, as its name indicates, occupies chiefly the region of the neck and occiput, but often extends to the parietal region, the face and even the arms. It may cause irritation of the cervical and sub-maxillary glands.

Paget and Anstie consider this form the most amenable to treatment. Blisters to the back of the neck, painting with iodine or the application of the electric brush, often cure it. It is often mistaken for myalgia, "stiff neck," and acute rheumatism. Hypodermic injections of chloroform (five drops), carbolic acid (ten drops of the twenty per cent), theine (one-half of a grain), or atropia (1-200th of a grain), all have cured. I have cured several cases with cannabis indica 1x, ten drops every two hours; rhus tox 1x, piper methisticum, and one case with an ointment of aconitine, one grain to an ounce of vaseline.

CERVICO-BRACHIAL.

This group includes all the neuralgias which occur in nerves originating from the brachial-plexus or from the posterior branches of the four lower cervical nerves. The most important characteristic of the neuralgias of the upper extremity is the frequency with which they invade several of the nerves derived from the lower cervical pairs. It affects the shoulder, arm, forearm, and hand, and is often very troublesome and severe.

Anstie says that in his experience the most common seat of this neuralgia is in the ulnar nerve.

My experience is that, in the majority of the cases I have treated,

the seat of pain has been in the shoulder, in the cutaneous branches of the circumflex. Neuralgia of the musculo-spinal and radial, near the wrist is often met with, but I have rarely seen it.

Putzel says that brachial neuralgia is rarely periodic; the paroxysms appear irregularly, and oftener than other varieties. He mentions as a striking characteristic that the "pains dart both up and down the nerves in the majority of cases instead of toward the periphery, as they usually do in other cases."

There is commonly a stiffness of the muscles, sometimes so severe as to lead to considerable contraction. Some of my patients complained of drawings and cramps in the muscles of the arm; also of formication, numbness, and a painful sensitiveness to the touch.

Weir Mitchell ("Diseases and Injuries of the Nerves") mentions many trophic changes, such as atrophy, "glossy skin," as if the integument was polished and drawn tightly over the fingers, palms, and back of the hand.

Brachial neuralgia resembles sciatica in its etiology. The majority of cases are due to local causes, which may be situated in the spinal column, in the course of the nerves, or at their peripheral distribution. It is often a symptom of chronic cervical pachymeningitis. I have treated two cases which were supposed at first to be brachial neuralgia, but proved to have a spinal origin. They ended in partial motor paralysis of the arm, contracture, and muscular atrophy.

In the beginning of the disease it is often mistaken for acute myalgia or rheumatism following exposure to cold, damp air, but its real character is soon evident.

Treatment. — Entire rest of the arm must be insisted on. The arm should be carried in a sling or bound to the side. Even when apparently cured, manual exercise will bring on a relapse.

Many authors assert that medicinal treatment is of no avail. They rely altogether on hypodermic injection of morphine and atropine.

Lilienthal recommends aconite, arnica, arsenic, ferrum, graphitis, ignatia, lycopodium, phosphorus, rhus, sepia, staphisagria, sulphur, turpentine, and veratrum, but he gives no special indications, and on consulting their pathogeneses I find no symptom of a definite character.

In my cases I tried them all with no perceptible effect, except aconite, of which I gave internally, and applied the tincture externally.

Hempel mentions a case in which the pain in the deltoid region was cured by large doses of aconite, but he gives no proof that it was a brachial neuralgia.

Phytolacca seemed to benefit one case when the pain was in the right arm and followed the ulnar nerve.

My two worst cases were not benefitted by electricity, or massage carefully applied.

Professor May, of Philadelphia, reported several cases benefitted by theine, one-fourth to one grain, injected into the region of the affected nerve, but in three cases where I tried it, it gave only temporary relief. In two cases I injected seven and one-half grains of antipyrin with no benefit.

INTER-COSTAL NEURALGIA.

Definition.— One of the most frequent as well as mildest forms of neuralgia. The pain is strictly confined to the course of the nerves, generally the anterior branches, and the paroxysms differ in no respect from those of other varieties.

If the pain is severe the patient leans toward the affected side (usually the left), and is afraid to take a long breath. The paroxysm may be excited by coughing, sneezing, or any sudden movement.

The pain is usually felt on the left side, from the sixth to the ninth intercostal spaces. In one variety the mamma is the seat of the pain, generally in women, although men are sometimes the victims. This is "Cooper's irritable breast." The pain darts through the breast in every direction, and the mamma, as well as the integument of the chest, becomes highly hyperæsthetic, so that the slightest touch of the clothing is unendurable. At the same time firm pressure as from a bandage produces decided relief. This in time gives way to anæsthesia over the surface supplied by the nerves. It is liable to be confounded with myalgia, or pleurodynia, as it is sometimes called. It may be mistaken for pleurisy by those ignorant of the nature and diagnosis of that disease. *Herpes zoster*, or "shingles," is the only complication of any importance.

Patients often call me to treat what they suppose to be pleurisy,

alleging that they have had it several times before, and that it was treated as such by their physicians. On investigating the symptoms, however, I found it easy to decide that their attacks were neuralgic. So severe sometimes is this pain that the patient is seized with an inexpressible and deadly feeling of cardiac oppression, very similar to an attack of angina pectoris. In such patients there is generally a degeneration of the arteries, and probably the coronary vessels.

Symptoms similar to inter-costal neuralgia often occur in girls and neurotic women, and are due to reflex irritation from the uterus or ovaries. The pain is usually infra-mammary, nearly always just below the left breast. It may also occur during pregnancy or when nursing, if the nipples are diseased. Aortic aneurism of the descending arch, or abdominal portion, may cause it, or it may arise from disease of the vertebræ.

Anæmia is often a radical cause of this affection. Finally it may be purely hysterical, for we know that hysteria will imitate nearly all disorders. During the last few years a large proportion of cases of inter-costal painful affections have been caused by the poison of la grippe.

Treatment.— First, be sure the pain does not arise from myalgia or acute rheumatism; or that it is not caused by commencing Pott's disease, or spondylitis deformans.

Then ascertain if possible the cause. If anæmia prescribe arseniate of iron. The best form of this drug is found in the "Levigo Water," from a spring in Tyrol. The dose is one teaspoonful in half a glass of water, after meals. If from leucorrhœa, remove it by appropriate remedies, which will be found to include in their symptoms both disorders (cimicifuga, kali carb., sepia, and calc. hypophos.). If from prolonged lactation the child should be weaned, and the mother given phosphoric acid, cinchona, helonias, cimicifuga, hydrastis, or arseniate of iron.

Our standard homeopathic remedies for pleurodynia are:

Arnica when the pain resembles pleurisy; the integuments of the affected side is sore and feels bruised, the patient cannot lie on that side long, and must change position often. If the pain has its origin in a blow it is fully indicated. An arnica plaster applied over the most sensitive region often gives relief and acts as a stay to the parts.

Sticta pulmonaria is of special importance in cases resembling pleurisy not of traumatic origin.

Borax is recommended by Lilienthal, but theoretically, I suppose, as I know of no verifying clinical experience.

Spigelia has many symptoms which make it indicated. I have found it useful when the pain occurs in connection with chronic endocarditis.

Guiacum has been useful in that form of pleurodynia which occurs during the softening of tubercles in the lungs, also in cases purely rheumatic.

Rananculus presents a most perfect picture of this disease, but I have not had good success with it. It may be because I did not use it in large enough doses. Some of its symptoms point to that rare disease, neuralgia of the diaphragm, as it causes a violent spasmodic hiccough. I generally used the third dilution. Perhaps the tincture would be better.

Rhododendron seems indicated when, with the pain, there is "dyspnœa from a sensation of constriction of the chest," a symptom often observed when herpes is impending. When herpes zoster appears during the pain, mezereum is thoroughly indicated.

An ointment of oil of peppermint in vaseline (equal parts) gives great relief to the pain when rubbed gently into the skin over the eruption.

Senega is useful when there is a cough, with a sensation of rawness of the bronchial mucous membrane, with pleurodynic pains.

The tincture of persea (alligator pear) has lately been recommended for inter-costal neuralgia. It is given internally in small doses and rubbed on the affected parts. It is used for this purpose in the West Indies and Central America.

Antipyrin, said to be very effectual in doses of three to five grains every four hours, has been known to give decided relief when the pain is paroxysmal and spasmodic.

Phenacetin has been very useful in my hands when the inter-costal suffering is intense, and the patient begs for some palliative; especially is it useful when the cause is grippe. Many of the most violent cases I ever treated originated in an attack of that mysterious disease. It may require ten, twenty, or thirty grains, given in doses of five grains every hour, before relief is gained, but when

gained the patient sleeps calmly. I have seen no unpleasant results from such doses. The only pathogenetic symptoms I ever observed from its use were palpitation (in one case), and profuse sweating in several. It is much safer than antipyrin or exalgin, although I cured a case with the latter in a young woman, with two-grain doses of the 1x repeated every hour for twelve hours.

The physician will often be tempted in violent cases to use hypodermic injections of morphine, but it should be remembered that injections into the chest walls are apt to cause alarming symptoms of heart failure. It is not the drug injected that causes the collapse and syncope, but the act of injecting, for the syncope comes on immediately, before the drug could possibly act. I know this to be a fact, for in two cases I injected a few drops of tepid water and the result was just the same.

LUMBAR NEURALGIA.

Definition. — A neuralgic affection, arising from the lumbar plexus. It does not at the same time involve all the branches of the plexus, but is limited to one or two. The branch most generally affected is the crural, then next in frequency the ileo-inguinal and ileo-hypogastric. Whichever branch is affected, at the height of the paroxysm the pain often radiates to other branches. There is often intense hyperæsthesia over the track of the nerve.

In neuralgia of the ileo-inguinal the pain darts into the scrotum or labia majora, and is often attended with frequent and painful micturition.

In *crural* neuralgia the pain is felt in the distribution of the middle and internal cutaneous nerves to the anterior and inner aspects of the thigh, and sometimes down the inner part of the leg to the foot and great toe. Herpes may, but as a matter of fact rarely does, attend it. This is the variety so often present during attacks of dysmenorrhœa. It also complicates ovarian neuralgia, and I have known two cases when it followed a forceps delivery. It is sometimes combined with neuralgia of the testes, a horribly painful affection.

Lumbar neuralgia should not be mistaken for lumbar myalgia, or "lumbago" as it is sometimes called. It is doubtful if the lumbar muscles are actually affected by true rheumatism. In lumbar

myalgia the attack is often sudden, when turning over quickly in bed, or when making some lifting or twisting effort. Lumbar neuralgia is slower in its access. The former will not allow the patient to move without pain. The latter does not affect movement to any great extent. Rising from a seat is very painful in lumbago, not generally so in neuralgia. Both may, however, be combined.

I can find no mention of the confusion of this form of neuralgia with passage of calculi through the ureter, but in a case which was under my care for two years, the man suffered from very violent paroxysms exactly similar to those attending neuralgia of the ileo-inguinal and crural branches. The pain in one testicle and the dysuria were excruciating. No remedy selected by the symptoms was of any benefit. The urine was carefully examined from time to time without finding any traces of mucus or calculus. One day in his office he had a sudden desire to urinate, and during the act felt something pass down the urethra, causing violent cutting pain. It dropped into the urinal and was fortunately saved. It proved to be a calculus composed of prisms of cystine, a very rare form of stone. It was as large as a small white bean, very spiny and irregular. No pain was ever felt afterwards.

Treatment.—Examine for uterine or ovarian disease, and if found treat it. If not, examine the urine for traces of calculus. If the urine contains uric acid in excess, give lithia in some form or boro-citrate of magnesia. If the crural nerve is affected and is worse during menstruation, give xanthoxyllum or cubebs. If the ovary is sensitive, give conium, valerianate of zinc, or bromide of ammonium. If the pain starts from the lumbar region or seems to be complicated with myalgia, give cannabis indica, five drops of the tincture or 1x every hour, or cimicifuga in the same doses. In a very obstinate case, in a young woman, the pain extending over the course of the ileo-inguinal and crural, which resisted cannabis, phenacetin, and codeine, immediate relief followed the injection, hypodermatically, into the inner side of the thigh of seven grains of antipyrin. I once cured a case by placing two belladonna plasters on the lumbar region, one on each side of the spine.

Putzel says, "Small fly-blisters applied over the painful spots at the exit of the affected nerve from the lumbar spine, are of decided advantage." Also, "In my own hands the greatest amount of relief

has been obtained from the use of strychnine, beginning in doses of 1-48th of a grain three times a day, and gradually increasing until physiological effects are obtained."

Raue recommends for crural neuralgia, phytolacca and staphisagria, but I cannot imagine why, for not a single symptom of the crural nerve is to be found in their pathogeneses.

Coffea seems indicated and should be tried if the intense erithism of that drug is present, and the patient does not use coffee.

SCIATICA.

Definition.—A disease which ranks next to trigeminal neuralgia in interest and importance. It is characterized by the occurrence of pain in the course of the sciatic nerve and its branches. It may be restricted to the gluteal region and upper part of the thigh, or may extend to the sole of the foot or toes. The principal painful points are those which correspond to the sacral foramina, where the large and small sciatic nerves emerge from the pelvis; a series corresponding to the branches through the fascia, a fibular point at the head of the fibula, an external malleolar, and an internal malleolar.

Sciatica generally begins with a dull heavy ache which gradually becomes more and more intense, and which, like all the other forms of neuralgia, is aggravated by muscular exertion. It is subject to exacerbation of violence, during which the least agitation of the body still further increases the intensity of the suffering. The pain sometimes darts like electric shocks through the whole length of the nerve. It may occur suddenly, like the case mentioned by Putzel, which came on immediately after rising from a kneeling posture. The pain may shoot from the origin to the periphery of the nerve, or vice versa, or shoot up and down, with terrific violence. The agony may be so great as to tempt the patient to suicide. The pain may be confined to the main trunk or be limited to one of the branches. It was formerly believed and taught that sciatica was caused by rheumatism, gout, or syphilis, but recent authorities like Hammond, Anstie, Putzel, and others deny any such general causes. It seems to be hereditary. I have met with many cases where the tendency to the malady could be traced back for several generations.

It is rarely if ever caused by malaria, although the malarial cachexia aggravates it exceedingly. There is often great hyperæsthesia, the slightest touch of a sheet or hand causing intense pain and spasmodic twitching of the limb. Convulsive contractions of single muscles, as of the calf and back of the thigh may occur, and sometimes the whole leg may be convulsed, contracted, or twisted. In my own case I frequently felt at night a rotary drawing of the muscles, turning the knee inward, occurring after the violence of the pain had subsided.

Hammond implies that sciatica is a neuritis, but Pritchard ("Amer. Jour. Med. Sciences," Jan., 1891) says a careful distinction must be made between sciatic neuritis and sciatic neuralgia. He gives the following table:

Sciatic Neuritis.	Sciatic Neuralgia.
Causes: Wounds and tumors.	Same, but anæmia and malaria oftener.
Pain duller, in paroxysms, and in the intervals paræsthesia, as pricking, tingling, and numbness.	Pain sharp and more constant; paræsthesia (except numbness) rare.
Movement, especially forced extension, gives pain.	Pain not affected by movement.
Anæsthesia, often rapid in onset, and in limited areas.	Actural anæsthesia very rare, but general numbness may occur.
There may be swelling of the nerve trunk, and tenderness on pressure.	No swelling, and distinct pain (not tenderness) on pressure at certain points.
Trophic changes in the skin, hair, nails, and muscles, with paresis or paralysis and reaction of degeneration. Faulty position of body. (Babinski.)	None except wasting from disuse.
	Quite exceptional.

Sciatica may be caused by passive congestion of any of the pelvic viscera, by retro-version of the uterus, displaced ovaries, hemorrhoids, fissure of the anus, pregnancy, intra-pelvic tumors, exudations in the broad ligament, hardened fæces in the rectum, excessive abuse of sexual passion or enforced abstinence. Sciatica is frequently mistaken for myalgia, but the pain of myalgia is always absent if the limb is kept quiet; sciatica is present when the leg is motionless as well as during movement. Locomotor-ataxia is with difficulty distinguished from sciatica. Hip-joint disease may be the cause of symptoms believed to be due to sciatica.

Treatment.—After treating and removing uterine, ovarian, syphilitic, and hysterical causes, if any, ascertain if there is constipation.

I have found this to be a common cause, and I can understand why purgatives have always been held in such high esteem in the treatment; in my early practice, when I considered it heretical to use them, I treated unsuccessfully several cases with the remedies recommended in our text-books. A copy of Braithwaite's "Retrospect" came into my hands, in which was narrated a cure by means of croton oil, so extraordinary that I determined to throw aside my prejudices and try it. Selecting the worst case, a man nearly bedridden, and a great sufferer with sciatic neuralgia, I gave him one drop of croton oil. Imagine my astonishment when he came into my office the next day, and performed some gymnastic feats such as he had not been able to do for years. He said that after three or four hours he had six or eight very profuse watery stools, mixed with hard lumps of fæcal matter, the quantity of which greatly surprised him. After the evacuations he was relieved of nearly all the pain, and slept soundly all night, which he had not done for months, except under the use of opiates. He had no return of the sciatica afterwards, but I enjoined him to keep the bowels open by means of fruits and mild laxatives. Since that time I have cured several intractable cases by croton oil, or elaterium, which acts nearly in the same manner. These hydrogogue cathartics act in two ways. They remove old accumulations of fæcal matter which have become impacted in such a situation as to press upon the nerves. They also cause an exosmosis from the congested pelvic tissues and veins, and relieve the stasis by the free flow of serous fluid. I have often cured a recent sciatic neuralgia with one large dose of Epsom salts, or Rubinat, or any of the "bitter waters."

Where there seems to be only an accumulation of fæces in the rectum and colon, a copious enema of hot water with glycerine is sufficient. This should be repeated until the bowel is thoroughly unloaded. A pill of aloin and hyoscyamus or aloin alone (one-fourth of a grain), by carrying off impacted fæces, will cure many recent cases of sciatica.

When the pain during the paroxysm is unendurable we are obliged by the entreaties of the patient to use some immediate palliative agent. Morphine, or morphine and atropine, hypodermically, is generally resorted to, and there is no objection to its occasional use, but it should not be repeated often for fear of the patient con-

tracting the morphine habit. I have used injections of codiene, one-half of a grain, with much benefit. The agent used in the syringe should be changed occasionally. I have found warm-water injections to give as much relief as morphine in some cases, if the patient believed it was morphine.

Deep injections of chloroform, ether, and cold water have been credited with the cure of many cases.

The chief remedies used in our school are arsenic, rhus, belladonna, cimicifuga, colocynth, cocculus, gnaphalium, iodide of potassium, ledum, menyanthes, nux vomica, phytolacca, ruta, stillingea, and zinc.

Arsenic and rhus should be compared, as they resemble each other in many of their symptoms.

Belladonna presents a very good picture of sciatica, and is probably used more than any other medicine. It is especially useful if neuritis is present, and the course of the nerve can be marked out by the cord-like swelling and redness.

Cocculus and colocynth compare well; both have the motor symptoms, the cramps, convulsive drawings, etc., which is found in some cases. Ægedi's cure, by colocynth, of an old case of sciatica with its spasms and violent pains, is one of the marvels of our therapeutics. The dose was the 8d dilution.

Not long ago I found narrated some notable cures of sciatica with purgative doses of colocynth. The reporter supposed the cures were brought about by ridding the bowels of impacted fæces, but the main symptom of his cases were those belonging to colocynth provings.

Gnaphalium has cured some severe sciatic pains, when the whole trunk and main branches were affected.

Ledum has quite an array of sciatic pains, but they are mixed with rheumatic.

Lilienthal ("Therapeutics") mixes, in all his indications for remedies in sciatica, many myalgic symptoms. In fact, they are about equal, and the indications are as good for one disease as for the other. It is the same in practice. Both diseases are often found in the same patient at the same time. Iodide of potassium, phytolacca, and stillingia are excellent medicines in syphilitic cases. But I have rarely met with true syphilitic sciatica, and then there was

coincident motor ataxia. I well remember one case in which I used all the approved medicines and iodide of potassium, in all doses from one to ten grains, four times a day, without effecting a cure. The patient then placed himself under the care of a notorious specialist, who cured him with massive doses of iodide of potassa. I was told by the patient that he swallowed during the two months he was under treatment the enormous quantity of half an ounce a day, nearly all the time. But he was cured.

When sciatica is the result of neuritis, and nearly all chronic cases are, the treatment will be protracted and perplexing. The medicine should be carefully selected and continued for weeks. Arsenic has cured some of the worst cases on record, but the patients were under its influence for months. The dose was from one to ten drops of Fowler's solution three times daily.

The difference in action between arsenic and iodide of potassium is, that the former acts on the axis cylinder or nerve itself, while iodide of potassium acts on the fibrous sheath of the nerve.

Now in inflammation of the sheath, usually called neuritis, there is effusion, just as in synovitis.

Iodide of potassium causes absorption of the effused fluids. When both nerve and sheath are involved, the iodide of arsenic would better meet the indications. Phytolacca and cimicifuga act like iodide of potassium; both are indicated in neuritis, but cimicifuga does not cause effusion. If the inflammation is clearly rheumatic, aconite and veratrum viride internally and topically are indicated, while bryonia is a good remedy in the first stage. Hypodermic injections of aconitine into close contact with the nerve has made some brilliant cures. Begin with the 1-500th of a grain. It can be increased to the 1-60th, and one obstinate case required the 1-20th, but it is hardly safe to go beyond the 1-100th of a grain. An ointment of aconitine or veratrine, five to ten grains to the ounce of vaseline, often gives great relief in neuritis and intense sciatic pain.

Turpentine is a very old remedy for sciatica. It has cured when given in immense doses. In several cases on record half an ounce was given, but while it cured the sciatica it caused a cystitis and injured the kidneys. Usually I have found two to five drops, three or four times a day, sufficient. I believe it to be indicated partic-

ularly when the cause of the sciatica arises from some irritation of the urinary organs.

Dr. C. L. Dana reports good success in rheumatic patients with sciatic pains from equal parts (four drops of each) of turpentine and gaultheria.

Salol has made some excellent cures. Dr. Aschenbach used it on himself; after being confined to his bed three weeks, and trying numerous other drugs, he was immediately cured by seven grains in the evening and fifteen at midnight.

Phenacetin is perhaps the most popular remedy with the regular school, and they certainly make surprising cures of sciatica with it. They use it in five-grain doses, repeated every hour or two, until the pain disappears. I can verify its value, both in five-grain doses and less, having cured many cases with five-grain doses of the 1x trituration.

Antipyrin is equally popular with some physicians, and in the same doses as phenacetin, but we cannot always be sure it will not cause alarming symptoms in patients susceptible to it, even in very small doses. The same can be said of acetanelid and exalgin; they should not be used except as a last resort, and then very cautiously.

Among the external applications none has given more brilliant results than congelation. A spray of ice water, or ether, often relieves the pain in a few moments. A spray of chloride of methyl has been used with wonderfully good effect. Dr. Devonis ("Revue Medicale," Aug. 16, 1884) congealed the integument over the nerve, and says "the effect was marvellous." The relief from pain was instantaneous, though there were sometimes slight relapses, which yielded at once, however, to a repetition of the congelation. The skin was blanched temporarily, and only occasionally was vesication produced. Since Devoris' experience Dr. Raymond announced to the *Societié de Biologie* that he has obtained similar favorable results from the same method. He found, however, that the results were just as favorable if he used the spray on the unaffected leg, and not necessarily along the course of the affected nerve. He thinks this proves that the relief from pain was due to an impression made upon the spinal centres by refrigeration of the peripheral nerve terminations rather than by any influence upon the nerve itself. Dr. Hain-

mond prefers ice bags applied to the posterior part of the thigh. Sir Joseph Fayer relates an interesting case of chronic sciatica, probably a neuritis, in a man. The pain was very severe and continuous, with violent paroxysms. The patient was wasted and worn; the posterior muscles of the thigh were atropied. On examining the limb he discovered some fluctuation, with fulness and tenderness in the course of the sciatic nerve near its origin in the upper part of the limb. He introduced a long narrow knife into the swelling until it entered the sheath of the nerve. This gave exit to a couple of drachms of clear serous fluid, which was followed by immediate relief of suffering, and rapidly resulted in complete recovery. This should lead us to examine the limb carefully in severe cases.

Dr. Menz, of Vidalia, La., reports a brilliant cure by means of a deep hypodermic injection of twenty drops of a four per cent solution of cocaine over the sciatic foramen, in a case of sciatica of ten years' duration. The pain ceased immediately, and six weeks after there had been no return of the pain.

Nerve-stretching has cured a few obstinate cases of sciatica. For the details of the operation see recent works on surgery.

The mistletoe (viscum album) has been accredited with the cure of some severe cases. (See "New Remedies," Vol. 2.)

Viscum is a close analogne of ergot, being used for the same purpose. In an old number of Braithwaite there is a report of several cases of sciatica of long standing cured by one-drachm doses of ergot (fluid extract). According to present physiological teachings ergot is supposed to cure neuralgia due to congestion of the nerve, such as we find in some cases of neuralgia of the trigeminus. Such large doses could cure only by contracting the dilated vessels which supply the diseased nerve, as it is not primarily homeopathic to any true nerve pain. Ustilago ought to act equally well. Dioscorea has cured sciatic pain radiating from the abdomen; æsculus, when it was caused by hemorrhoids; zinc, when occurring in connection with spinal irritation. I have made many excellent cures with valerianate of zinc, in doses of one grain three times a day. (Always give it in pills or granules, on account of its villainous smell.)

Caffeine, gauranine (paullinia), and theine have cured cases of sciatica when taken internally or used hypodermically. Theine was

introduced by Professor Mays, of Philadelphia, who has reported several cases cured promptly by injecting, near the most painful portion of the nerve, the one-eighth, one-half, and one grain of pure theine. He insists that theine acts differently from caffeine, and should be made from good tea. We know that caffeine and theine, while similar, are not identical, as chemists assert.

Nux vomica has cured many cases of sciatica. It should be a good remedy on account of its specific action on the spinal cord. I believe it cures for this reason, and not because it has any special affinity for the sciatic nerve. It appears to act best when the functions of the cord are below normal, as in anæmia of the cord. I have had better success, however, with its alkaloid, strychnine, given for a long period, in doses of one-hundredth of a grain. Putzel says it has given him better satisfaction than any other drug. "In idiopathic cases, and those due to exposure, etc.," he begins with one forty-eighth or one thirty-second of a grain three times a day, and gradually increases the dose until physiological effects are produced. I doubt if this extreme use of strychnine is ever necessary.

Those who have read Hilton on "Rest and Pain" will remember how earnestly he pleads for absolute rest in some diseases of the nerves. I have found that in some cases of sciatica absolute rest seemed all that was needed to effect a cure. Hammond emphatically declares that it is invaluable, and advises that we should not merely order the patient not to walk about or confine him to his bed, but that we should put the leg in a splint. He uses the old-fashoned long splint reaching from the axilla to the sole of the foot, and attached to the body and lower leg by means of a bandage. Dr. S. Weir Mitchell uses the same method. Both claim excellent results.

NEURITIS (Inflammation of the Nerve).

Neuritis may be acute or chronic, local or general; that is, affecting one nerve or several, or all the motor nerves of the body. As an acute neuritis is most always followed by the chronic condition, and as the local form differs somewhat from the multiple, I shall discuss neuritis in two sections: localized neuritis and multiple neuritis.

LOCALIZED NEURITIS.

Etiology. — Cold is a frequent cause (rheumatic neuritis). Trauma, such as wounds, blows, pressure, the result of fractures and dislocation, and hypodermic injections; Syphilis, sympathetic extension, and tumors.

Pathology.—An isolated neuritis is generally adventitial; when the fibres themselves are affected there is a parenchymatous condition. In the acute stage there is swelling and redness, or even small hemorrhages into the nerve tissue. If this is limited to the sheath it is a perineuritis; if into the nerve itself, an interstitial neuritis. These changes may be continuous or local. The fibres may be a sclerosis of the nerve; or if fat is finally deposited, there is the lipomatous variety (Leyden). When due to syphilis a neuritis may have the character that marks other syphilitic formations.

Symptoms.—There may be some constitutional disturbance, especially if cold is the cause. The chief symptoms are local, and pain is essential, in the nerve, and often in its distributions. The nerve is sensitive to pressure; pain is increased by movement, and is burning, boring, worse at night; if the nerve can be reached (as in the brachial or ulnar) it will be found enlarged, and occasionally the skin is red with slight œdema, and some hyperæsthesia; the muscles become weak, but their powerlessness is due rather to increase of pain than to paralysis. Perspiration may be profuse, and at times eruptions on the skin occur. As the acute inflammation subsides, the local pain disappears, leaving a general numbness, with tingling, formication, paræsthesia, and weakness. Tactile sensation is impaired and loss of power is marked; ultimately when there is not recovery the muscles atrophy, contractures occur in the fingers, or toes, and the nails and skin suffer from defective nutrition (glossy skin).

The electrical changes vary according to the involvement of each nerve. They may be absent, or perfectly typical as in facial paralysis, which is a neuritis.

Course and Duration.— An acute neuritis may last only a few weeks and disappear entirely, or run into the chronic form, and persist for months; or if the course (as a dislocation or tumor) be not removed, a cure is impossible.

Diagnosis.— A sharp distinction must be drawn between neuri-

tis and neuralgia, though many mistakes are made in calling a neuritis neuralgia. In neuritis there is inflammation. The nerve trunk in its whole length is sore, or in one spot only. There is tingling or anæsthesia in the distribution of the nerve, with some degree of paralysis, and not rarely trophic changes, and intermission is due only to improvement or to opiates. In neuralgia, on the other hand, distinct remission is the rule. There are spots, where the nerve approaches the surfaces, which are decidedly painful, whereas the rest of the nerve may not be at all sensitive; it may even feel relieved by pressure. There is no inflammation, no paralysis, and is cured not so much by local treatment as by attention to the general condition of the individual.

Treatment.—Remove the cause, be it local, as a wound, or general, as gout or syphilis. Absolute rest is necessary; all contractions in the limbs must be prevented, and the posture should be such as to discourage secondary contractions. The limb may be steamed to induce diaphoresis, and then surrounded by hot poultices. Cold may be used to advantage if an injury is the cause. It must always be remembered that too prolonged applications of either heat or cold are dangerous, as the nerves controlling the trophic conditions of the skin are in this case themselves involved. If the pain demands relief, the best measure, and one far preferable to morphine, is the hypodermic injection of cocaine into the affected area, about one-fourth to one grain; it acts locally, and even has an effect on the inflammatory process itself. In the rheumatic form, the salicylates and antipyrin are useful, and mercury in small, repeated doses has an unmistakable influence for good. In the chronic stage, counter-irritation is useful, and electricity here can be employed (whereas it is distinctly harmful in the acute stage). Apply the constant current in a mild form. In very old cases it may be wise to cause actual pain with the current, and to resort to the induced current to stimulate the contracting muscles. Massage must be persevered in and the general health most carefully attended to. Arsenicum, apis mel., arnica, and hypericum are remedies of great value in either the acute or chronic form.

MULTIPLE NEURITIS (Polyneuritis).

Multiple neuritis implies a neuritis in which many nerves are inflamed at once or rapidly in succession. This is the most notice-

able symptom. Besides, it is symmetrical, even when only a few nerves are involved on both sides. The condition in question is rather parenchymatous than adventitial, and most often it is due to a morbid blood-poison, either organic or inorganic. To illustrate the difference between multiple and simple (parenchymatous and adventitial neuritis) the influence of gout may be used; gout causes a simple neuritis by a deposit in the nerve sheath or connective tissue that some exciting influence starts into inflammation. If the blood itself, while carrying the poison of gout, should thereby become irritative and attack the nerves there would be a multiple neuritis. Gowers accordingly groups the disease and its causes as follows:

1. Toxic: (a) Metallic, as lead, arsenic, etc. (b) Non-metallic, as alcohol, the most frequent cause, and diabetes, as in this case some substance allied to sugar must be present in the blood.

2. Toxæmic, due to some virus in the blood: (a) Primary, in which the neuritis is part of the first effect of a virus either (*1*) derived from without the body, as the neuritis of leprosy and other forms not yet definitely understood, or (*2*) produced within the body, as may be septicæmia neuritis. (b) Secondary, in which the toxæmic agent at first causes some definite disease, followed at a variable interval by a polyneuritis, as that of diphtheria, smallpox, variola, typhoid, tubercle, and perhaps syphilis.

3. Endemic, due to local organisms, having this for their primary or secondary effect, as malaria and beri-beri. Strictly these belong to class 2 (a) (*1*).

4. Rheumatic, following exposure to cold, and is possibly a morbid blood state. These probably belong to class 2 (a) (*2*).

5. Cachectic and senile forms, in which degeneration of the nerves seems part of a general mal-nutrition.

I cannot go further into the pathology of the disease, and shall now give the symptoms of a general, acute multiple neuritis, leaving for a slightly more detailed paragraph the discussion of alcoholic neuritis, lead and arsenic poisoning, and beri-beri. It is worth mentioning here, however, that syphilitic neuritis bears a marked resemblance to the phenomena in Tabes; it has even been called pseudo-tabes (neurotabes) and as Tabes (q. v.) is most always a post-syphilitic affection it is more than probable that the two states are pathologically allied.

Symptoms. — There are three classes of symptoms, one or the

other of which usually predominates: motor weakness, sensory disturbance, and incoördination. The type of the motor weakness is the wrist drop and steppage gait. The sensory symptoms are tingling, pains, and tenderness. The incoördination is the same as in early locomotor ataxy, and is often associated with loss of muscular sense. The onset varies according to the cause, but as one or the other of the above types predominates, the attention is attracted to the relative objective signs. Often there is a premonition fever, with bronchitis (after catching cold). The temperature rises to 103° or 104°, there is general malaise, the body aches, but pain in the nerves is by no means always complained of. Distinct symptoms appear only when the patient complains of tingling in the fingers and toes with vaso-motor disturbances of the extremities or cramps. Then comes loss of motor power, in the legs first as a rule, giving finally a picture of ascending paralysis; then foot and wrist drop, then a general loss of power, a flabby paralysis, often extreme, so that the diaphragm may be the only muscle capable of respiratory power. The muscles waste and may be hyperæsthetic, with soreness and stiffness in the limbs. Landry's paralysis can at times hardly be distinguished from it. Loss of coördination usually accompanies the loss of power; it is difficult for the patient to balance himself or to perform fine movements with his fingers. Tremors (in alcoholic cases) is often conspicuous before loss of power. Electrical reactions are those typical of nerve lesions. The knee-jerk and other muscle reflexes are always lost, but the sphincters seldom lose their contractility, and the skin reflexes disappear only in extreme cases.

Trophic changes occur in prolonged cases, and they then are similar to those of ordinary neuritis, such as glossy skin, stiff joints, changes in the nails, hair, etc.; œdema of the legs is common.

The course is variable. The patient may die within ten days, through paralysis of respiration or of the heart; but in a case of moderate severity the disease may persist for five or six weeks, remain stationary for a time, and then get well, though the paralysis and contractures may linger for months; even then a good recovery is not improbable. The first sign of improvement is a diminution of pain and hyperæsthesia, though muscle tenderness is slower to cease. When tingling that had once appeared and disappeared, reappears, it is a sign of improvement.

Diagnosis is important, as the treatment, by attacking the cause, can do much to help the patient. This, especially true of alcoholic neuritis, applies to all forms. The motor and sensory symptoms, in their unvarying symmetry, must be carefully observed. Pain on deep pressure strengthens the suspicion, especially when combined with tingling either before or contemporaneous with motor weakness. Tabes can be excluded by lack of lightning pains and pupillary reaction. Again, excluding tabes, no disease gives pain and a paralysis with loss of muscle reflexes (knee-jerk), except multiple neuritis; hysteria has never yet produced an actual wrist-drop or a loss of knee-jerk. A girdle-pain means involvement of the cord; neuralgia is never symmetrically bilateral, and always has "painful points."

Treatment.— Suggestions as to special treatment of the various forms will be given as they are discussed, but here a general survey only of the treatment to be adopted in every case can be given. In all cases the cause should be discovered and removed if possible. Rest is essential; rest in bed, with confinement of affected limbs if thought necessary; warm fomentations over the affected nerves sooth the inflammation and comfort the patient, but caution must be observed to prevent troublesome trophic disturbances. If the patient can stand it, daily warm baths are of value. The feet and arms must be suitably supported by splints or bandages, to prevent the deformities apt to arise from paralysis of the extensors, or from the habitual flexure of the knees.

Drugs seldom have a marked influence on the morbid process. The *post hoc propter hoc* reasoning must be avoided here as elsewhere, lest too great attention be paid to dosing and too little to hygiene. In the acute febrile stage more symptomatic treatment must be followed, to preserve intact the functions of secretion and excretion and to support the patient's strength. In rheumatic cases the salicylates do good, special attention being given to the kidneys. Gout must always be suspected, and if found (in alcoholics), treated. After the febrile stage a somewhat more direct treatment may be adopted with strychnine, iron, and quinine. Arsenic in small doses (always with the fear of increasing the trouble) is useful, and general tonics. Cocaine in doses of one-half to one-fourth of a grain helps a stomach depressed from alcohol.

If anodynes are unavoidable, cocaine and codeine are better than morphine; in fact, opium should never be used, as in any neuritis a habit is easily acquired.

Antipyrin, acetanelid, cannabis indica, bromides, sulphonal, chloralmid, hyoscine, all have their sphere, and may be used at discretion. Electricity, using only the galvanic current with large sponge electrodes, is especially serviceable in the stationary and convalescent stage, but must never be pushed to the point of pain. It can be applied daily, and then it helps materially to maintain the nutrition of the muscles. The nerves themselves are not, as a rule, affected one way or the other, though slight sensory loss is sometimes overcome by the faradic brush.

After the febrile stage, nerve vibration is a remedy that promises well for the relief of pain, and also for the restoration of normal motor function and coördination. The treatment should be given with the same regularity and frequency as in all this general class of cases; but the time for holding the hammer over individual points is governed by the rule for neuralgias, so far as the relief of pain is to be obtained. The operator should place hammer at farthest peripheral point of each of the nerves affected, following the same sequence at each sitting. He should also in these cases apply the flat disk over the region of solar plexus and over the nerve roots on each side of the spinal column.

Massage and passive motion should be persevered in, and meanwhile the limbs can be bound carefully in cotton or wool. Gowers warns against any temptation to perform tenotomy.

ALCOHOLIC NEURITIS.

This is without doubt the most important form of multiple neuritis, being as common as all other forms put together. It occurs more in steady tipplers, "soakers," than in drunkards or those who go on sprees, and for that reason is found oftener among women than men, as women drink more in secret. The actual amount of alcohol taken has little to do with it, as the general health and such factors as gout, rheumatism, and syphilis modify the effects very much. The onset is gradual (seldom with fever) and is usually first marked by neuralgic pains and tingling in feet and hands. Then comes the paralysis in feet, legs, hands, and arms. This is either limited to

this extent, or all the muscles are involved. The sensory symptoms may stop at the numbness and tingling, or lead to severe pain, with soreness of the muscles. There is œdema in the extremities, and the skin reflexes are preserved while the muscle reflexes are lost.

Fortunately the prognosis is favorable, though convalescence may be prolonged, a not unfortunate circumstance, as it gives a greater chance to wean the patient from his (or her) bad habits. In this form of peripheral neuritis, the symptoms of the so-called steppage gait is most marked. It must not be mistaken for a tabetic gait, for the foot is thrown much higher, as if stepping over obstacles, and the incoördination is not so obvious. The mental symptoms are quite striking in this alcoholic form, for delirium is common, with hallucinations of grandeur (see general paralysis). Even delirium tremens has been noticed, though Wilkes' striking symptom of loss of appreciation of time and space, delusion of long journeys, continual conversations, etc., is a remarkable form of an alcoholic mania.

Treatment especially directed toward ameliorating the poison and effects of alcohol should be maintained. Reduce the stimulant as rapidly as possible without depressing the heart too much, and be careful to avoid opium; one habit is as bad as another.

LEAD AND ARSENIC POISONING.

It is probable that the slow and steady use of arsenic leads to tolerance, and that only the rapid absorption of a non-lethal dose produces a neuritis. The general symptoms are not unlike those of alcoholic poisoning. The steppage gait is characteristic here. Lead shows its evil effects upon the system in many ways when the "palsy" appears. If it be a true neuritis, in addition to the general symptoms of blue gums, colic, and anæmia, we have the wrist-drop symmetrically developed (the type), or the brachial form, involving the deltoid, biceps, brachialis anticus, and supinator longus; the Aron-Duchenne form, involving the small muscles of the hand (see poliomyelitis anterior chronica), or the laryngeal form, or the peroneal form. This lead neuritis comes on slowly without fever.

Treatment.—In the colic stage morphine may be given and watery purges freely used. Avoidance of sources of absorption and a persistence in massage, electricity, and fresh air will often cure.

BERI-BERI, KAK-KE (Endemic Neuritis).

This is a wide-spread disease, having its habitat in Japan, India, and the islands of the surrounding coast; it probably depends upon a specific organism that leads to a multiple neuritis; beyond this fact, much remains to be investigated. Europeans seldom suffer, but there is a predisposition engendered by a continuous diet of fish or rice.

Symptoms.—The course is usually chronic (with occasional acute manifestations), gradual in its onset, and the symptoms are typical of a peripheral neuritis always symmetrical.

Pekelharing, who investigated the disease in the East Indies at the instigation of the Dutch Government, says that even if the patient declares himself quite well, signs of neuritis can be discovered before the actual symptoms show themselves.

The legs are chiefly affected, and in this case the cardiac branches of the vagus, showing heart failure and dropsy. The urine is lessened in amount, or even suppressed; there is no albumin.

The earliest symptoms found by Pekelharing were changes in the electrical reactions (*i. e.*, a reaction of degeneration), in the flexors of the ankles. The subjective symptoms are heaviness of the legs, weariness, diminution of tactile sensibility, with palpitation of the heart. Then begins the dropsy (in the legs first), the face has a peculiar doughy appearance, and the heart sounds are roughened. Sensibility to touch is lost, to pain preserved, giving an anæsthesia dolorosa. Other nervous symptoms of neuritis are common. Death, if it comes, finishes the scene in from two to six weeks, and is due to œdema and heart failure.

The *diagnosis* cannot be mistaken if there is an epidemic; otherwise the first symptoms may be ascribed to alcoholic neuritis, but it is well to remember that in the alcoholic form the legs and arms are apt to suffer together, and there is but little heart failure or œdema. The two may occur at the same time, however.

Treatment.— It is to be hoped that a method of prophylactic inoculation may be found. At present, the treatment must be that of neuritis in general, especial care being taken to sustain the heart, not by large doses of digitalis and strophanthus, but by small frequently repeated doses. In this, as in other forms, rest is absolutely essential.

NEUROMA.

Many new growths may have their seat on the nerves, especially fibromata, secondary carcinomata, and syphilomata, but a true neuroma does occur, as demonstrated by Virchow. Here an increase of nerve fibre with ganglion cells can be made out. The cause is obscure except in the case of traumatic amputation neuroma, where the tumor occurs at the end of a nerve left in a stump; this may be simple or multiple.

If the tumor occur in the course of the nerve it may cause no symptoms, or it may be very painful, with paralysis of the muscles supplied below. If the tumor can be felt, and is painful, and if single, it may be cut out, care being taken that in case it infiltrates the nerve itself, it be carefully removed and the divided ends of the nerves sutured. In amputation neuromata excision is always practical. If syphilis is the cause, mercury and the iodides take the place of the knife.

MYELITIS.

(Inflammation of the Spinal Cord, Acute, Sub-acute, and Chronic.)

Softening of the spinal cord, a term sometimes applied to an inflammation of its substance, is not proper, as the result is not always softening, nor does softening always necessitate an earlier inflammation. As the spinal cord does not, as soon as other organs, regain its function after an inflammatory disturbance, the terms acute or sub-acute have a significance relative principally to the mode of onset. The symptoms as a whole may be the same, but they appear with greater or less rapidity, together or following each other, as the case may be. For practical use, an inflammation of the cord presenting all the symptoms within two weeks of its onset may be called acute; if two to six weeks elapse, sub-acute, and any longer period necessary to give a picture of the disease may properly make the case chronic.

Though undoubtedly many of the symptoms of chronic myelitis simulate and are even indistinguishable from the results of sclerosis, yet, as a diagnostic fact, the distinction must be adhered to that chronic myelitis is an inflammation, scleroris a degeneration of a slower growth with no febrile antecedent, and often can be definitely

traced to such causes as syphilis and alcohol, and my purpose can be better served by giving only an outline of the symptoms in various phases of diseases of the spinal cord, with a few hints as to immediate treatment, advising the student to consult more special textbooks for his intimate pathology and therapeutics.

The *causes* may be cold, damp, exposure of any kind, injury, fevers, and other diseases of impaired vitality, lead and other poisons, syphilis, and chronic degenerations of the cord itself.

The whole area may be involved, or only certain tracts, and according to the extent of the lesion do we use the terms general myelitis, or transverse, focal, disseminated, etc.

The most conspicuous symptoms are those that show an interference with the functions of the cord, and these may be the first signs of disease, but generally a slight febrile state precedes the decided evidence of paralysis, which in any case comes on rapidly, with weakness in one or more limbs, numbness, tickling, prickling, trembling, or cramps. The patient then becomes so helpless as to stay in bed, and he may lose control of the bladder and rectum. The numbness leads to anæsthesia, with a band-like feeling around the body, indicating the line of inflammation. If the inflammation extends upwards, then the anæsthesia and paralysis rise higher in proportion. Disorders of nutrition in the affected parts follow, blisters form on the feet, bed-sores and sloughs appear, or there may be a multiple arthritis. If the disease extends as high as the cervical region and medulla, the muscles of respiration may be involved, and death follows.

The diagnosis is difficult only with regard to multiple neuritis and meningitis; but in multiple neuritis there are no trophic disturbances, and in meningitis the febrile symptoms, pain, and muscular rigidity are most marked, while in myelitis these sink into insignificance beside the paralysis and anæsthesia.

A distinct variety may be alluded to as *Compression Myelitis*, due to pressure on the cord from an injury, in which case the symptoms appear suddenly; or to a tumor, or caries of the spine, in which case the onset is gradual. The pressure exerted in any case can extend over only a few inches, and on the post-mortem table, if not clinically, the cord and its surrounding neighborhood show plainly enough the results of pressure. The most striking characteristic of

such pressure is disturbance in the function of the cord at the involved area; pain along the course of the nerves supplied by it, paralysis in the muscles, and only after local symptoms are manifest do signs of a general myelitis appear.

Treatment.— If the very first stage of a myelitis due to cold is discovered, the usual treatment for an inflammation of this nature should be adopted; a hot bath, free diaphoresis and counter irritation, but if paralysis has begun it is best to insist on complete rest at once; rest, not on the back, but with enough support to the back to adopt the sitting position; a mild counter-irritant is useful, as a blister, for example. Otherwise, the treatment in the early stages can be aimed merely towards keeping the patient comfortable. Keep the bowels open, and counteract toxæmic conditions. Brown-Sequárd advised ergot; belladonna has its adherents, but there is really no specific. Prevent bed-sores, watch the skin carefully, keep the bladder healthy, and guard against contractions by proper splints. As the stationary stage comes on, more freedom of movement may be allowed, and tonics must be resorted to, including massage; electricity has no influence over the cord, but is a good agent when a mild current is applied to keep up the tone of the affected muscles.

In sub-acute and chronic cases, preserve the general health by a change of air, tonics, and proper mental and moral surroundings. Avoid over-exertion or exposure to cold. Do not insist on complete rest. Sea baths, counter irritation with blisters or the actual cautery, are at times useful.

The drugs indicated by the symptoms are aconite, bryonia, cicuta, arsenicum, agaricus, gelsemium, phosphorus, hyoscyamine, physostygma, turnera (damiana), picric acid, ergot, ignatia, nux vomica, strychnine, and phosphide of zinc. (For special indications, see Lilienthal and Raue.)

ACUTE MYELITIS OF THE ANTERIOR HORNS OF THE SPINAL CORD.

Atrophic Spinal Paralysis, Acute Atrophic Paralysis, Infantile Spinal Paralysis, Acute Poliomyelitis Anterior—any of these terms may be used to designate a disease of the spinal cord occurring most frequently in children, and manifested by symptoms showing an

impairment of the anterior horns particularly, rather than of the whole cord itself.

Though cold is a decided cause, it may follow any of the eruptive fevers or a diarrhœa, or appear suddenly in perfect health.

Symptoms. — The onset is usually sudden, with only a premonition in the way of general debility and malaise. A fever of short duration most always accompanied by vomiting is followed by the essential symptoms of a widespread, rapidly developing paralysis that may include even all the four limbs, but which seldom lasts in its original severity, most muscles regaining their normal functions; but the paralysis always in its retrogression leaves some one set of muscles distinctly affected. The lower extremities most often suffer, and though hemiplegia is rare, it does occur. Pain is not necessary, but when present it is referred to the muscles, or to the joints, as it is most acute on motion, but its real nature is a neuritis independent of, but associated with, the myelitis. The sphincter muscles usually escape, though there may be incontinence of urine, either temporary or permanent. Sensory disturbances, beyond the pain mentioned above, are absent, except in extreme cases (one in fifty, Gowers). The reflexes in the parts related to the paralyzed muscles are lost.

After the initial paralysis is fully developed a period of greater or less extent supervenes before improvement sets in. This improvement shows itself in the parts last affected, and thus continues till there remain only those muscles that are to show a lasting injury. By careful examination it may be seen that these muscles are toneless and flaccid from the first, and a distinct wasting distinguishes them from the others, so that the limb loses its normal shape. Fat children may present some difficulty to the diagnostician, for an interstitial growth of fat masks the genuine wasting. There may be a tenderness to the touch. As a result of the muscle atrophy the limb is deformed, either by an actual disease of the bone or by the weight of the limb (Volkmann), added to a predominant action of the healthy muscles and the loss of function in the diseased muscles. There is no longer faradic irritability (contraction), and the reaction of degeneration is present in its characteristic form. The affected part is at first slightly elevated in temperature, but as paralysis increases the limb is colder than normal. The course of the disease shows three stages (Gowers): (1) An initial stage of paralysis,

varying from a few hours to a week or more. (2) A stationary stage of one or more weeks. (3) A stage of regression, in which the paralysis disappears except from those parts that are to remain permanently diseased. Death is uncommon, relapses are rare, and sequalæ are not marked except an inclination of the cord toward other inflammations.

Apply to adults the same conditions of acute paralysis, with or without fever, exclude cerebral affections, mark the nearly complete recovery from the original general muscular involvement, with a limited permanent loss of function in some set of muscles, and the same picture holds good for acute poliomyelitis in adults as in children.

Pathology.— Investigation points to an inflammation limited to the grey matter of the anterior horns of the cord, with probably a tendency to hemorrhages into the cord, greater in this case than in that of a general myelitis.

Another distinct type of myelitis, in this case designated as *acute ascending paralysis* ("Landry's Paralysis"), is well marked enough to be called by Hun ("New York Medical Journal," May 30, 1891) "A Clinical Entity," though "no corresponding lesion has as yet been discovered." Here we have the weakness of the legs, sometimes increasing rapidly, passing to the arms, and finally involving the medulla. There is no muscular atrophy, but the reflexes are lost. Sensory phenomena are not prominent, though there may be some tingling sensations. The electric reactions are preserved and no muscular atrophy appears. The mind remains clear, but death is the rule, occurring about ten days from the beginning of the disease. I have called this a myelitis, though the pathology is by no means so evident as that of the common form of myelitis. By some it is disputed whether the spinal cord is at all the primary seat of the lesion, ascribing it rather to a blood disturbance that manifests itself chiefly upon the nervous elements in the anterior horns, either as a poison or as a hemorrhagic affection.

The symptoms are, however, so closely allied to a rapid inflammation of these anterior horns that for practical purposes it may be included in this chapter.

Treatment.—Nothing can be added beyond the hints given under Acute Myelitis. Especial care should be taken to keep the child on

the side, so as to prevent a stasis of blood in the cord. Hot fomentations seem to give marked relief and should always be tried. Even if belladonna or ergot do no good they certainly are harmless, and can be used without fear.

Perfect rest is advisable for two weeks after inflammation has subsided, and not until the stationary stage is assured or even improvement has set in can some motion with tonic treatment be authorized. Here strychnine seems to be of great service if used properly, for though it may be said that power will be regained without medicine, yet the drug is a great stimulant, and if carried only to the extent of aiding the nerve recovery it has no equal.

Electricity is an important agent, but it must be understood before the benefits it is capable of can be secured. One fact must be always borne in mind. It does not influence either the nerve or the spinal cord, but it does help to maintain the nutrition of muscle, and while the nerve is getting well the muscle must be encouraged to do likewise. If the muscle fibres are excited from time to time by electricity, their sensitiveness to stimulation is distinctly increased, not only to electricity but to the voluntary stimulus. "Wherever cell and fibre have perished nothing that electricity effects can be of service; but where there has been damage, not destruction, and the fibres slowly recover, but regain their influence on nutrition and their capacity for conveying impulses only after some months, the failure of muscular nutrition may be disproportionately great, and may even render useless some regained nerve power. This result electricity is probably able to prevent. The electrical treatment may be commenced at the end of the third or fourth week after the onset. It should not be used earlier, lest it excite increased disturbance in the spinal cord. The application need only be made to those muscles in which faradic irritability is lowered or lost."

The galvanic current is the best, applied locally to the muscle, with gentle, frequent interruptions. Be sure to get contractions, but avoid giving pain, and encourage the patient to see the harmlessness of the battery. Massage and rubbing are equally important; use no liniment, but keep the limbs dry and warm.

As soon as some voluntary power comes back, encourage exercise, at first passive, then active, and by any convenient device avoid

awkward contractions by appliances suited to prevent spinal curvatures, talipes equinus, etc.

Do not claim too much credit for your treatment; give nature her due in this disease, reserving for yourself the modest praise of having helped her powers.

MULTIPLE SCLEROSIS OF THE BRAIN AND SPINAL CORD.

(DISSEMINATED CEREBRO-SPINAL SCLEROSIS, INSULAR SCLEROSIS, SCLEROSE EN PLAQUES.)

Multiple sclerosis is a chronic disease, the anatomical explanation of which is to be found in the development of numerous unsymmetrical sclerotic patches, scattered irregularly in the brain, or cord, or both. It is observed in youth chiefly, though cases have been seen at sixty; the etiology is very obscure; it is said to follow blows, excitement, and catching cold. The eruptive fevers encourage it, and heredity plays some part in the cause; syphilis is a mere accident. The development is slow, remissions are possible, but the prognosis is bad, and death is certain. The most important symptoms may be emphasized as follows:

(1) *Tremor*, rather volitional than continuous, absent when at rest, but aroused and exaggerated on voluntary motion. In this it differs from the continuous tremor of paralysis agitans, and a good diagnostic distinction can be noted on asking the patient to drink a glass of water. In multiple sclerosis he can hardly, if at all, get it to his mouth. This tremor is irregular, jerky; the tongue and lips partake of the trouble, and partly on this account, partly on account of a central lesion. (2) The *speech* becomes slow, accented, staccato, scanning, indistinct, and finally unintelligible. The voice is monotonous. (3) *Nystagmus.*

The strength of the muscles is retained, though there may be paresis and even paralysis. Oftener, however, there are spastic symptoms, depending as a general thing upon the "increased reflexes," and more marked in the lower than in the upper extremities; this increased reflex may pass into the condition known as "spinal epilepsy," and is induced by a blow on the tendons, or

attachment of muscles to bones. The gait is slow, passive motion is retarded, but sensibility is not markedly interfered with. Bladder and rectal symptoms are seldom found. The cerebral power is, however, depressed; there may be weak-mindedness, melancholia, and even imbecility; apoplexy has been an intercurrent trouble, or epilepsy and simple vertigo is not at all uncommon.

The symptoms mentioned belong to a typical case, but many instances can be found of an untypical character that confuse the diagnosis or render it impossible till a post-mortem examination shows the brain and cord degeneration. When the characteristic gait, disturbance of speech, and nystagmus are present the diagnosis is easy; otherwise the best of clinicians may mistake.

Treatment must follow the line as suggested for chronic myelitis, the symptoms of the disease and of the general health being met as they arise. Nerve vibration is always to be carefully considered in the treatment of the disease. The treatment is primarily directed to stimulation and reëducation through function and the absorption of adventitious tissue; secondarily to producing rythmical vibration to subdue tumultuous and irregular vibrations of the nervous elements, and thus restore orderly functions. First, apply the disk over closed eyelids with very light pressure and a rapid vibration; second, apply disk over the auditory meatus, a slower vibration; third, apply large hammer to tongue, small hammer in anterior nasal cavity. Then small hammer to all points on body where nerve trunks lie very near the surface, and lastly over each spinous process. Operation should be repeated daily.

CHRONIC DIFFUSED MENINGO-ENCEPHALITIS.

(General Paralysis of the Insane, Dementia Paralytica, General Paralysis.)

Although from a symptomatic point of view general paralysis is generally classified with mental diseases, and treated in the special text-books of the alienist, yet fortunately the pathology in this case has escaped the realm of the imagination, and become a matter of exact clinical and post-mortem macroscopical and microscropical investigation. It may be said that many other diseases demanding the care of the alienist, and manifesting signs of mental perversion,

are traceable to a distinct morbid process; but as a fact of pathology such is not up to now the case. The symptoms of many kinds of insanity may be the same, yet a greatly differing pathological course may be found at work. The cause then is only individual and accidental, but in general paralysis all cases are found to have only one underlying pathological cause; therefore, to reverse the rule, demonstrate this underlying pathological condition, and most probably there will be found symptoms of a General Paralysis of the Insane. Therefore it has been thought best to mention it here, especially as the disease, in its early manifestations, is one that often demands the knowledge of it from the general practitioner.

Definition. — A gradual loss of the power of coördinated movements, accompanied by gradually increasing mental disturbance and decay, ending in dementia and paralysis, due to a chronic progressive meningo-encephalitis.

Pathology.—Essentially a sclerosis of the brain tissue; an atrophy of the brain, attacking particularly anterior halves. The pia mater is thickened and in places adherent to the cortex. The vessels are tortuous, and there may be arterio-sclerosis. The convolutions are atrophied in spots, and in fresh cases, there may be general or localized signs of an inflammation. There is also a degeneration of the axis cylinder of the nerve fibres and of the ganglion cells. Mendel uses the expression, an interstitial encephalitis. Struempell believes the process to be a primary degenerative atrophy of the nerve bundles and cells, to which the increase in connective tissue is secondary. In the spinal cord there is more or less extensive change, marked by degeneration of the pyramidal or posterior tracts. (See Tabes.)

Etiology.— Males from thirty to fifty, married, suffer more than females; the patients come more frequently from the cultured classes. Heredity, especially of a neuropathic constitution, plays a minor part, but business worry, added to excess of all kinds, particularly alcohol, can seldom be eliminated, while syphilis accounts for seventy-five per cent of cases.

Prognosis and Causes.— The disease when once developed is incurable, though spontaneous remissions are not uncommon; but death is sure to follow in from two to fifteen years, due either to exhaustion or to some intercurrent malady.

Symptoms (First Stage).—It is hard to establish a beginning to the disease, for a change in disposition is often its earliest and only manifestation. The patient cannot do his work well, his memory fails, his habits alter and he becomes disorderly; his judgment plays him false, while his temper may be abnormally irritable. He plots, speculates, and grows extravagant, boastful, till his family wonder "what has changed him so." Meanwhile there may be frequent complaints of poor health; subjective sensations of headache, rheumatism, vertigo, sleeplessness, and indigestion, but even in this first stage, when a patient to all intents and purposes a neurasthenic applies for treatment, two diagnostic signs are of vital importance: (1) The loss of power of mental conservation (the best test is a sum in multiplication), and (2) phenomena of motor disturbances. Watch carefully for tremor of the tongue and lips in speaking, slowness of speech, inequality of pupils, and an awkwardness in handwriting.

(Second Stage.)—This is characterized by mental exaltation and pronounced motor disturbance. The delirium may be extravagant, hypochondriacal, or melancholic, or there may be a passive self-satisfied state. Mania can develop; most always there is great restlessness, sleeplessness, excitement, violence. Here, if anywhere, are observed the ideas of grandeur, that make the patient claim to be of fabulous wealth, to have the most beautiful wife and children in the world; to be a king with millions at his feet, etc. If these "ideas of grandeur" are escaped from, the other extreme of excessive melancholy generally develops, or the two may alternate; and memory gradually fails. At this period the motor symptoms can no longer be overlooked or mistaken.

The writing is bad or illegible; the speech slow, stammering, one syllable runs into the other, and the tongue, lips, or even the facial muscles, twitch abnormally. The pupils are unmistakably involved with a loss of reaction to light; the reflexes are diminished (tabetic) or increased (spastic). Neuralgia is not uncommon, nor are attacks of vertigo, or even apoplectiform seizures and paralysis. Epilepsy (Jacksonian) is frequent, usually on one side. The gait is impaired, the patient trips readily, and cannot go smoothly up or down stairs. Sexual desire is increased, and when there is no restraint great excess

may be indulged in even by the most virtuous. Then degeneration advances rapidly, the bladder and rectum are lost control of, the patient becomes bed-ridden, and dies completely demented.

Diagnosis. — As the family physician is always the one under whose observation the patient first comes, it is necessary that the earliest symptoms should be well studied, so that the man himself and his family and friends may be put on guard, and a proper prognosis given, with an attempt at the only rational treatment, rest and restriction. To repeat, the salient symptoms are a distinct change in temperament, great increase or depression of spirits, loss of memory, weakness of intelligence, the characteristic effects on speech and writing, and bodily weakness; add to this the loss (or exaggeration) of reflexes, slight motor paresis, mild paralytic attacks, and rigidity or inequality of pupil. With such symptoms, and a history of excess, or syphilis, or business worry, the suspicion passes into certainty. A mistake in diagnosis may lead to one of the saddest errors of professional or social life. A man can be ostracised, perhaps driven from home and friends and ruined in business, because he had violated some moral law; the world finally points with scorn at him, and uses as an example of retributive justice the fact that his death occurred in a madhouse, whither his remorse had driven him. But had the skilled physician seen this sinner when first his system broke down, had his moral offences been recognized as part only of the general physical decay from the meningo-encephalitis, then the cause would not have been confused with the effect, warning might have been given, and even though no cure were possible, a good man's name might have been saved from obloquy and his days ended peacefully under the watchful care of an asylum.

Treatment. — All excitement and business must be stopped, and the patient removed from his usual surroundings, but the actual continuous treatment can be carried on only in a properly equipped asylum, and every inducement should be urged for the patient's residence there. Individual symptoms can be treated as they arise, but the least suspicion of syphilis should be followed by a resort to mercury and the iodides; while the early stages of excitement and cerebral inflammation may be softened by warm baths; careful electrization can be tried; ergot has been recommended.

CHRONIC DEGENERATIONS OF THE SPINAL CORD.

(Locomotor Ataxy, Tabes Dorsalis.)

This disease is by far the most common of the sclerotic affections of the spinal cord. The symptoms vary much in individual instances, but the general manifestations combine always the essentials of the peculiar girdle pain, defective sensibility, incoördination of movement, and the loss of myotatic irritability (muscle reflex, the type of which, and the symptoms always used in examining for diagnosis, being the knee-jerk).

The intellectual city classes are attacked oftener than the inhabitants of the country, and males much oftener than females. The disease is generally one of the prime of adult life, from thirty to fifty years, heredity playing a subordinate part, and the influence of syphilis far outweighs any other cause, some authors claiming as high as eighty per cent. Strange as it may seem, however, the analogy does not extend into the pathology or treatment, for the lesion is a purely degenerative one, and syphilitic treatment has an acknowledged lack of effect on the course of this degeneration. Cold, injury, and overexertion are exciting if not immediate causes. The course of tabes cannot be stated with accuracy, as one case may end in death within a year, while a second case may develop only certain symptoms, remaining stationary thereafter for a good part of the lifetime.

There are three stages into which the disease may be classified, (1) the initial loss of reflex action with the pains, (2) the beginning ataxia, (3) complete incoördination.

In itself, tabes is not fatal, but it leaves the general system such an easy prey to intercurrent maladies, that life is certainly shortened thereby. Myelitis, either acute or subacute, may develop from tabes, as well as other lesions of the cord, even to an invasion of the anterior cornua; but the muscular atrophy incident thereto is not itself a sign of tabes, and should not be confusing to the diagnosis.

Tabes has a distinct relationship to General Paralysis, depending probably on the syphilitic origin, and one disease may simulate the other, or run into the other, till a dominance of one or the other is reached.

Valvular heart disease is a common complication (the cause here may be the syphilitic infection).

Pathology.—Of the pathology it can here be said only that essentially it consists of a sclerosis of the posterior columns. All else is dependent on individual manifestations of symptoms that shows an involvement of other cord tracts or nerve fibres. The histology should be studied by itself, from text-books dealing with the subject in a more technical way; undoubtedly there is a pronounced involvement in advanced cases, of the tracts of nutrition and of the end nerve fibres in bone and cuticle.

Symptoms.— A typical case of tabes must present three symptoms: (1) The "lightning" pains of a sharp, momentary character in the affected parts, and the "girdle" pains of a constrictive character; (2) a loss of reflex action, most pronounced in the typical "knee-jerk," and (3) incoördination of movement, generally in the movement of the legs, but sometimes in the arms or other muscular functions. The pains and the loss of knee-jerk precede the other, but with these three undoubtedly present, the diagnosis must not be doubted.

The "knee-jerk" is familiar to everyone. The "lightning" pains compel mention by the patient, but the incoördination may need some deftness in detection. What is called "Romberg's sign" is the earliest test. Let the patient stand with his feet close together, the heels and toes touching each other; then, with his eyes closed and arms extended, watch his movements; most people subjected to this examination will at first feel insecure, but a tabetic patient will fall. This sharp distinction can be drawn, that if a patient fails to maintain equilibrium after repeated trials, incoördination is present. Other minor symptoms need mentioning, as they help in the diagnosis. Atrophy of the optic nerve is common, and trophic changes in the joints, bones, and skin; in fact the skin manifests many changes, both objective and subjective, of a neuritis. Spontaneous pain occurs frequently, at any part of the body; paroxysmal, most severe at night, lasting for a few minutes or a few hours; they may correspond to a nerve trunk or may have no relation to a nerve. Instead of lightning, or stabbing pains, they may be burning and cause great distress. All sorts of parasthesic sensations may be complained of, as tingling, creeping, heat, and cold, or increased or diminished sensibility. Sensation may be delayed, or perverted; or a touch in one limb may be ascribed to the other. The sole of the foot may lose

its sensations; sometimes the change in sensations lies deeper than the skin, so that the muscles do not notice any force exerted upon them, or the patient cannot tell the position of the limbs; in such cases severe injuries may escape detection. Pleurisy, for example, may be painless. Loss of sexual power may be an early symptom.

The Argyll-Robertson sign, in which the iris reflex is lost to light, but retained to accommodation, is a very common symptom (five-sixths of all cases, Gowers), and transient weakness or paralysis of one or more eye muscles, with ptosis, can often be noticed. Blindness, due to optic nerve atrophy, may appear. There may be deafness and loss of smell, but it is hard to distinguish these symptoms objectively. All the sphincters may suffer, and indeed a chronic cystitis due to paresis of the urethra may be the first symptom complained of by the patient.

What has been called "perforating ulcer of the foot" has been found to be almost confined to tabes, and this trophic disturbance, together with others of the skin, as ecchymoses, pigmentation, will need attention. Spontaneous fractures are common, and these, together with painless swellings of joints, should arouse a suspicion of tabes, and finally, the visceral and laryngeal symptoms, what the French call "crises" may be the first evidence of the disease, partly on account of the non-association with catarrhal trouble, partly through their slow response to treatment. Extreme and prolonged vomiting, with pain sometimes without nausea, may give a great deal of trouble, and spasm of the larynx may threaten, and even, though rarely, cause sudden death. Such are the ins and outs of tabes; all these symptoms need not be expected, but any one may be looked for, and any one, with no immediate cause, must lead the physician to examine most carefully for the essential signs.

Treatment.—There is no doubt about the favorable effects of treatment in tabes, if carried out with perseverence and method, though it is by no means safe to promise a cure, or even to feel sure of an amelioration in some cases. To retard the disease, however, to make the patient comfortable even if the pathological process cannot be stopped, is a great encouragement to our art.

When the first signs of an initial tabes are detected the patient's habits of mind and body must be carefully regulated. Any overexertion, any excess or worry, must be stopped, and the surround-

ings made pleasant and healthful. Fatigue in walking is to be avoided, though gentle exercise is not harmful. Falls are particularly dangerous, as an acute inflammation may be started, or bones may be broken. Indigestion must be prevented if possible, for it often sets up a crisis of pain that might otherwise have been escaped. The same is true of constipation and catching cold. Smoking must be limited, and alcohol completely stopped. We have seen how an alcoholic neuritis can give symptoms akin to tabes. Sexual commerce, if admitted, should be at only infrequent intervals.

The first question in the use of drugs is in reference to an antisyphilitic treatment. It is wise always to suspect syphilis, and acting on this suspicion to try a course of inunction or internal medication with small doses (one-sixteenth of a grain of red oxide) of mercury, which so used has a good tonic effect anyway. If the second stage of syphilis has already appeared, use the iodide of potassium. This drug has an undisputed curative influence over syphilitic locomotor ataxia, but not in the minute doses of our school, or the officinal doses of the old school. Except in rare cases these are powerless. I have had under my care within the last ten years severe cases of syphilitic ataxia which did not improve under iodide of potassium or any other drug. I used the former in doses ranging from 1x to ten grains of the crude drug three times a day. Finally they all consulted and were treated by a physician notorious for giving massive doses of iodide of potassium. While under his care these patients were given half an ounce per diem of this drug for several months, with an occasional intermission of a few days. They were benefited, as I know from personal observation.

Aurum mur. et sodii is another valuable remedy for syphilitic ataxia when the physical and mental symptoms call for its use. The 2x trituration in three to five grains three times a day is the proper dose. In non-syphilitic ataxia, if it ever exists, many medicines have been used by both schools.

Arsenic is highly valued by the old school. Gowers ("Diseases of the Nervous System") says: "Arsenic is certainly a drug which most frequently does distinct good. Most of the cases in which I have known the greatest improvement to occur have been taking it at the time." He says it seems best indicated when there is also degeneration of the cutaneous nerves. (It causes peripheral neuri-

tis with degeneration.) Raue gives a few indications for arsenic, but Lilienthal does not mention it. Donovan's solution, arsenic and mercury, is credited with many cures. The dose should not exceed ten drops of the 1x dilution. It is a notable fact that the chlorides of many metals are efficacious and that most of them are anti-syphilitic agents. Boenninghausen recommends aluminum highly, while Gowers says he "has found the chloride of aluminum of distinct service."

Nitrate of silver is of undoubted value, as the testimony of both schools shows. The provings show it to be capable of causing a similar condition. The chloride of silver is highly esteemed by Dr. Delamater and others. The chloride of barium (baryta mur.) is often indicated in advanced cases in the very old, and Hammond has lately advocated its use in small doses. There are symptoms in the provings of platinum which indicate that the chlorides of that metal ought to be useful in ataxia.

Other most important medicines in ataxia are phosphorus, nux vomica, and picric acid. Phosphide of zinc and picrate of zinc may in some cases act better than phosphorus, and strychnine better than nux vomica. Other medicines to be consulted are physostigma, rhus tox., cuprum, augustura, conium, hyoscyamus, and stramonium, but we cannot expect any curative results from such drugs; they cannot arrest the sclerosis and other degenerative processes.

A new and unique remedy, "cerebrine," prepared from the brain of animals, ought to be mentioned. Dr. Graeme M. Hammond, on the 14th of April, 1893, presented to the New York Neurological Society a case of locomotor ataxia treated with hypodermic injections of cerebrine. Six years ago the patient, a man aged forty, had begun to suffer with double vision. This, after several months of treatment, had disappeared, and for a time he had been quite well. Then the typical symptoms of locomotor ataxia came on. There was complete loss of the knee-jerks; he had sharp pains in his legs; the ataxic gait was well marked; there was inability to stand with his eyes closed, even when the legs were some distance apart; he had difficulty in evacuating his bladder and bowels; his sexual power was lost, and he had a sense of constriction around the waist. There were no eye-symptoms. The man denied syphilis. Treatment was begun about ten weeks ago, and consisted of a daily injection of cere-

brine, five minims combined with five minims of water. The improvement was marked. The man's sexual functions had been perfectly restored; he had complete control over his bladder and bowels; the sharp pains had disappeared; his general health had improved; he was able to run up and down stairs, and could stand fairly steady with his eyes closed. The knee-jerk, however, had not returned. The improvement had been gradual and steady, and had begun about a week after the first injection.

Struempell would discourage any excessive use of baths beyond a mild application of luke-warm water. Profuse sweatings by extremely hot water or steam, so often undertaken for the false rheumatic pains in tabes, are in his opinion decidedly harmful. The most a gentle warm bath can do is to lessen the girdle pains by soothing the nervous system.

For these pains, antipyrin, acetanelid, phenacetin, or exalgin are useful and the least harmful. Cocaine hypodermatically, or a simple liniment, may help the more superficial pains. If any pain grows too severe for these minor remedies, morphine must be resorted to.

Laryngeal crises generally yield to amyl nitrite or to glonoine. Glonoine is also useful, in small doses combined with strychnine, to dilate the capillaries while the strychnine acts on the cord and nerves. The strychnine or nux vomica is undoubtedly efficacious in strengthening the bladder, as is also belladonna or atropin, but too much dependence must not be placed upon it if there is any indication of continued residium of urine. A cystic catarrh must by all means be overcome, and no hesitation should interfere with a proper emptying of the viscus. In such cases the catheter must be constantly employed, with due aseptic precautions. The electric current is of little influence over the actual sclerotic process, but it aids in subduing the superficial pains and in preserving as long as possible the normal tone of the muscles, and the proper tendency of the sphincters to contract.

Such precedures as nerve stretching and extension are more fully discussed in technical works, but their utility is already a matter of grave doubt.

In the treatment of non-specific ataxy, nerve vibration promises to become of the greatest value. Many long-standing and very advanced cases have through persistence in this treatment been per-

manently cured. The applications should be daily, as near as possible at the same hour, and of the same duration, rapidity, and pressure. At first apply small flat hammer over tendons at the root of the toes, then behind each maleolus at the ankle, over the entire surface of the soles of the feet, over the patella tendon, over along course of sciatic, over crural at groin. After two or three months' treatment, continue by applying in addition over the spinous processes.

The first effect is likely to be an exaggeration of the pains for a period of one to three weeks, followed by gradual diminution of pain and final cessation. In a few weeks there will usually be noticed a slowly advancing diminution of the exaggerated movements, followed by gradual approach to coördinate and finally complete coördination of motion. The treatment must be persisted in from one to three years, with only occasional but entire cessations of from two to four weeks.

Spinal extension has received considerable attention in this and allied affections of the spinal cord; while it seems to have gone out of fashion now, it is without any doubt of value in many cases, and should be used carefully and judiciously as an adjuvant to other treatment.

PRIMARY LATERAL SCLEROSIS.

(Primary Spastic Paraplegia.)

Although theoretically, or from a physiological point of view, the above disease may be present in its typical form, practically the cases of pure lateral sclerosis are extremely rare, the symptoms being most always associated with those of ataxic paraplegia, to be described next. As, however, the essentials of a simple lateral sclerosis may be of value to the diagnostician, I give them here.

Of the *causes*, much the same can be said as of locomotor ataxia, syphilis, injury, cold, and to some extent, heredity. The third and fourth decade suffer most, and no influence is shown by sex.

Symptoms.—First of all comes weakness of the legs, complained of chiefly by a patient as noticeable after exertion that previously was not tiring. One leg may be weaker than the other. This weakness may be accompanied by unsteadiness, due to weakness (that is, sub-

jective), not to incoördination. There is a loss of power in the flexors, and the knee-jerk is increased and quick. The foot clonus is demonstrable too. A tendency to spasm may be first noticed as a stiffness in the morning, which increases as power is lost, till the spasm is manifested on any extension of the joint, even to tonic spasm, "clasp-knife rigidity."

The gait then becomes characteristic, for the leg drags behind, the toes catch on the ground, and the spasm may be developed by any attempt to bring the limb forward. Usually the limbs retain their normal shape, and electrical reaction is unaltered. Other muscles besides those of the leg may suffer, as the arm and trunk, but not often, and the "pains" complained of can be taken as a symptom of muscular weakness rather than of a nerve involvement.

All these signs may show themselves in the infant.

General Paralysis of the Insane, with only slight mental impairment, may show itself first in lateral sclerosis, as in tabes. This is a very chronic disease, the least dangerous to life of any degeneration of the spinal cord. Supposing the disease typical, the *pathological anatomy* will give evidence of a sclerosis of the lateral columns of the spinal cord, analogous to that of the posterior columns in tabes, but any extension of this process beyond these lateral tracts brings us to the more general form of spinal cord weakness known as Combined Lateral and Posterior Sclerosis, or —

ATAXIC PARAPLEGIA.

A disease showing symptoms of both paraplegia and ataxy, combining some of the signs of a pure lateral sclerosis with those that can come only from involvement of the lateral columns and of the posterior columns, as in tabes, and proved by pathological examination to be dependent upon just these conditions implied in the above name.

Causes.— A distinct difference from tabes must be noted, for heredity plays but a small part, and "a history of syphilis is as rare as it is frequent in tabes" (Gowers). Middle aged males suffer most. Cold is an exciting cause, as well as injuries and sexual excess. Some cases seem to arise without cause.

Symptoms.— The onset is slow; walking is first impaired, thus

resembling spastic paraplegia; there is stiffness and trembling of the lower extremities, with soreness and aching. Sensory symptoms are slight, however. To the early signs of spastic paraplegia, add ataxic unsteadiness, uncertain movement in the dark; Romberg's sign, an awkward, tabetic gait, the patient using a stick for support. On lying, too, this unsteadiness is present, as it is hard for the patient to touch objects with his feet. In contrast to tabes, however, sensory and reflex symptoms are absent, the only noticeable one being a dull pain in the sacral region. Myotatic irritability is exaggerated, and the knee-jerk is pronounced, and increases as the disease progresses. Sexual power is lost at an early stage and the sphincters commonly become involved. Eye symptoms are rare, but when present should start a suspicion of syphilis. Nystagmus can sometimes be found when the eyes are in motion. The incoördination after a time remains stationary, but the paralysis increases, involving the arms and perhaps the head, while sensation is unaffected, and the mind, except in those cases that show a tendency toward General Paralysis of the Insane, is clear to the end.

Departures from this type indicate a closer approach to tabes or a condition of chronic myelitis.

Diagnosis.—Marked incoördination with retained reflexes, a slow progress, some spasm, and only slight sensory or ocular symptoms.

Treatment. — Little can be added to the treatment of either lateral sclerosis or combined lateral and posterior sclerosis. The pathology being in all cases a sclerosis of the cord, and the treatment being in outline that suggested for a posterior sclerosis. It must be confessed that our knowledge of drug action on the spinal cord is very slight, and in such an apparently incurable disease as this we must be cautious in our reliance on medicines. Though strychnine has been recommended for posterior sclerosis (tabes), it must be watched very closely here, so as not to give it the extent of producing spasm by its physiological effect, as spasm is one of the very symptoms we here try hardest to combat. The bromides are sometimes useful to overcome this spasm, as are also cannabis indica, belladonna, and hyoscyamus, though the effect of none of these is lasting. Fatigue of any kind is harmful, whereas passive exercise with massage is often beneficial.

Another departure from the routine treatment for posterior scler-

osis can be tried in the use of sweat baths; this may be distinctly helpful.

Electricity is never of service, and tenotomy, though recommended by some, has no rational application.

The spinal extension and nerve vibration should be used in these cases, where possible. The same method of application as recommended for ataxy is best adapted.

HEREDITARY ATAXY.

(Friedreich's Disease, Hereditary Ataxic Paralysis.)

A form of combined lateral and posterior sclerosis, differing from the ordinary types of ataxic paraplegia and tabes by reason of the early age at which it begins, and certain additional symptoms. "Friedreich's disease" should give place to the better term I have used, although credit is due to Friedreich for the first classical description. The heredity of the disease is rather of family tendency than of direct descent, for in most cases a neuropathic temperament can be traced, but as a rule it affects several members of the same generation. Owing to this fact, some pathologists have tried to establish the theory of an arrest of development in the spinal cord, though the best authorities (see Gowers) do not in every case admit this, insisting on interpreting it as a genuine sclerosis.

Other *causes* than heredity and neuropathic tendency play a minor part. Alcoholism in the parent, syphilis, consanguinity of father and mother, if not causing, may at least intensify the disease. The sexes suffer equally, and the age most marked is the seventh and eighth years of life. It may be earlier or even later.

Symptoms. — The first sign is a gradual loss of coördination, beginning in the legs, with a peculiar gait, more swaying, reeling like a drunken man, instead of the high-stepping, stamping gait of true tabes. Romberg's sign cannot always be trusted. In children the first indication may be a readiness to stumble and fall as the disease advances; the arms, and even the heart, are clearly involved, and their movements are swaying, jerky, and choreiform. The muscles do not lose their power and the nutrition is good, but the reflex action is lost. Rarely it is retained or increased. Speech is finally impaired;

it is slow and the expression dull, but the mind may not lose its vigor till the very end. Nystagmus should always be looked for as it is an important sign, but atrophic optic neuritis is seldom found. Though nutritional perversions are not present, there is paralysis, and some of the most common changes are deformities, due either to the muscular lesions or to mechanical irregularities. Sensory symptoms are variable, though rarely are there any lightning pains or severe pains of any character. There are no visceral crises. The duration of the disease and the rate of progress also are uncertain, death being generally due to some intercurrent disease.

Pathological Anatomy.—This is a sclerosis of the lateral, extending sometimes into the anterior columns, with an intensity of the process in the posterior columns (as in tabes) more marked than in ataxic paraplegia.

Diagnosis. — Hereditary ataxy (Friedreich's disease) is distinguished from tabes by the fact that it begins usually in very young children, younger always than those in whom pure tabes can be demonstrated, and by the absence of "lightning pains" and crises or other pronounced disturbances of sensation. Disseminated sclerosis does not begin so early, nor does it appear grouped in families, and disorder of speech is different, while there is a more marked tendency to convulsions. Nystagmus in children must always suggest hereditary ataxy. Chorea should always be carefully excluded.

A disease of congenital origin, or one implying a congenital defect in function, holds little encouragement for *treatment.*

The methods employed against ordinary tabes, such as arsenic, silver, and perhaps phosphorus, may be tried, and any symptomatic measure thought advisable; but it is a question what good, if any, can be obtained from mere drug exhibition.

PELLAGRA.

Fortunately the disease does not appear in America, but is endemic and even hereditary among the poorer classes of Italy, Spain, and Southern France, whose diet consists largely of the native maize, a fungus (or as some claim a perverted growth) of which is the cause.

The name is significant only of one phase of the disease, the affection of the skin, but in a severe grade there can be little doubt that

the spinal cord, in its lateral and posterior columns, with some atrophy of the nerve cells in the anterior cornua, is affected.

The first attack begins with symptoms of a mild sun-stroke, with an erythematous eruption on the skin to which it has been likened, malaise, vomiting, and fever; recovery may be complete from this, but in subsequent attacks, especially if the unhealthy maize has not been excluded from the diet, in addition to the fever and other constitutional and digestive trouble, there are symptoms pointing to involvement of the spinal cord resembling ataxic paraplegia; weakness in the legs, increased muscular irritability even to spasm, incoordination with tremor.

There can be an acute course with symptoms of spinal meningitis, or a chronic course, leading to paraplegia, dementia, and death from exhaustion. The reader who is interested in the poisonous effects of the various grains and allied products on the nervous system will find fuller reference to such diseases as pellagra, ergotism, lathyrism, in monographs on the subject referred to by text-books going more minutely into diseases of the nervous system.

PROGRESSIVE SPINAL MUSCULAR ATROPHY.

(AMYOTROPHIC LATERAL SCLEROSIS [CHARCOT], CHRONIC POLIO-MYELITIS, WASTING PALSY.)

We now come to the third great division of the chronic diseases of the spinal cord, where the sclerosis is never detected in the posterior columns, seldom in the lateral columns, and is most marked either in the anterior horns, the form labeled by Gowers as atonic atrophy, or in the motor (pyramidal) tracts with added involvement of the anterior horns, the form of tonic atrophy (Gowers), or of amyotrophic lateral sclerosis (Charcot). These types may be clear and distinct in their development, or there may be all stages of gradation from one to another, so that it is certainly best to consider them as only one disease with different manifestations, following in this the good example of Leyden and Gowers.

Pathology. — Opinions as to essential pathology I must leave to technical studies on the subject; I may as well, however, put down here all that is necessary for the student to know of the facts. The muscles shrink away and undergo fatty degeneration, while the per-

ipheral nerve roots (motor) degenerate. The anterior nerve roots, related to the affected muscles, atrophy; but the most marked changes are found in the anterior horns. Here we see atrophy, granular pigmentation, and disappearance of the ganglion cells. The blood-vessels may be increased in size, and in advanced cases the whole anterior horn is shrunken and the ganglion cells disappear. The gradual disease and disappearance of the ganglion cells explain the gradual atrophy of the muscles, as the former control the nutrition of the latter. In the tonic atrophic form (amyotrophic lateral sclerosis) there is found in addition to these changes a decided sclerosis of the anterior lateral tracts, generally most intense in the cervical region, as the arms are most always the parts first involved. It is beyond dispute that the wasting of the muscles depends upon the disease of the grey matter, and particularly that of the ganglion cells and the fibres proceeding from them. A slow decay of the motor path, in which the lesion of the ganglion cells is a striking incident, and the element on which the nutrition of the muscles depends, a wasting that is secondary to the spinal atrophy, is perhaps the best way of considering the lesion as a whole.

Symptoms.—Progressive muscular atrophy begins usually in the upper extremities, though the legs may be simultaneously, or very soon afterwards, involved. Preceding the wasting, which is the symptom objectively most important, there may be some mild pain in the parts to be immediately affected. This wasting, above mentioned, and weakness usually come on together. Either single muscles or groups of muscles, or whole systems of muscles waste away. Paralysis comes on as the muscles waste. On the hand, for instance, depressions may be seen between the metacarpal bone, and between the tendons of the palms, and the hand loses its strength. Occasionally the arm suffers first, and then the flexors are seen to disappear or the biceps and deltoid may lose their roundness. Then the arm hangs to the side, the hands look thin and withered, and the power is gone. If the muscles of the back are not first involved, they soon follow, in which case the trapezius, especially the lower part, may show a disposition to atrophy. When the muscles of the neck suffer, the head assumes a peculiar attitude; it is habitually inclined backward so as to balance on the spine, but if this balance is lost, the chin drops forward onto the chest, and the head can then be brought for-

ward only when the patient throws the trunk back, so as to be able to give a sudden jerk by which the head, as the sterno-mostoids contracts, returns to its original position. In this connection must be noted that the platysma myoides is never wasted, and is often, on the contrary, hypertrophied. The respiratory muscles suffer, and as they lose their size and vigor life may be threatened by difficult respiration. If the diaphragm is involved the breathing is carried on by the intercostals, or if the diaphragm escapes and the intercostals weaken, breathing is then abdominal. A careful examination is often necessary to prevent the error of supposing that a compensatory overaction of one set or the other shows no involvement of either diaphragm or intercostals. Wasting in the legs is not so common as in the arms, though it may occur. The face generally escapes, and shows a contrast to other parts of the body. Advanced stages of the disease shows a wasting that leaves nothing but skin and bone, the "living skeletons" of a circus or museum.

The spine generally shows some curvature. As the disease advances, electrical excitability diminishes, till none at all can be found; but the muscular irritability itself is retained, so that fibrillary contractions are common, either spontaneous or induced, although the reflex action ("knee-jerk") gradually disappears, except in the cases of "tonic atrophy" where the muscles get stiff, and do not waste completely; here the knee-jerk is retained.

Sensory symptoms are slight, only some pain or numbness. The atrophied limbs are cold and the skin livid. The bladder and rectum retain their functions, and the iris and optic nerve never suffer. The three distinct manifestations of the disease are, according to Gowers: (1) Atonic atrophy, becoming extreme. (2) Muscular weakness with spasm, but without any wasting, or wasting only very slight in degree. (3) Tonic atrophy, rarely extreme in degree, with myotatic excess. Other spinal cord sclerosis may occur intercurrently, and tabes has been associated with progressive muscular atrophy. Bulbar paralysis, to be described later on, is either a manifestation of the disease, or independent, with analogous pathological changes in the pons and medulla.

Progressive muscular atrophy, as the name implies, is steadily progressive, but not necessarily at the same rate. If it becomes stationary as the result of treatment or otherwise, it is apt to stay so,

but unfortunately a tendency in this direction may manifest itself only at a late stage. Two or three years is the ordinary interval before a limb becomes helpless, though a sudden increase in the severity of all symptoms is not rare. The greatest danger lies in the interference with respiration, and bulbar symptoms.

BULBAR PARALYSIS.

(GLOSSO-LABIO-LARYNGEAL PARALYSIS.)

Duchenne has given his name to this disease, the symptoms of which may be primary, or secondary, as a degenerative disease of the nuclei of the motor path, analogous to the lesions mentioned in progressive muscular atrophy, with which it is often associated. That it does appear primarily is the reason for giving it a separate description.

The acute form is either (a) hemorrhagic or embolic, or (b) inflammatory. When the onset is sudden (apoplectiform) the symptoms are generally bilateral. Speech is soon lost, the muscles of the tongue and lips being involved, with a consequent escape of saliva, swallowing is difficult, the lips are flabby, and perhaps the larynx suffers. Sometimes there is associated with the face and larynx symptoms a hemiplegia in the leg or arm, or an alternating hemiplegia, one side of the face and the other side of the body being paralyzed.

If the case does not prove immediately fatal, it may turn into the chronic form, which begins after the fortieth year, as a part only of general motor-nuclei degeneration. Here is noticed at first only a difficulty in speech; the tongue is partially paralyzed, and its muscles may atrophy; tremor appears; saliva accumulates in the mouth and may escape from it, chewing and swallowing are difficult, and the food is apt to regurgitate. The muscles of the vocal cord waste, and the voice is feeble, though seldom is there an actual paralysis. The mind remains clear, and death, which comes early, comes by aspiration pneumonia, or choking, or more rarely from paralysis of the muscles of respiration.

The Peroneal Type of Muscular Atrophy.—This is the designation used for a condition described by Dr. Howard Tooth, of London, wherein the symptoms seem confined to the peroneal muscles,

and a course apparently analogous to that of progressive muscular atrophy. It begins in both lower extremities simultaneously as a progressive weakness and paresis; the muscles waste slowly, individual muscles, rather than groups, suffering. Club-foot is a frequent result of this unequal distribution of muscular atrophy. The arms suffer much later and then the claw-hand results. The affected muscles occasionally present slight fibrillation. Faradic irritation may become extinct, and there may be partial or complete reaction of degeneration. There are no sensory, rectal, or vesicle symptoms, and though the knee-jerk is usually diminished, it is not necessarily lost. There is an undoubted heredity, and seldom does the disease show itself after the twentieth year. The progress is slow and sure, and the prognosis gloomy. The pathology is indistinct, as spinal cord lesions are not demonstrable in every case, but there seems a certain tendency to trace the disease to a primary neuritis with secondary involvement of the cord.

Treatment.— Keep the general health as nearly normal as possible, and encourage exercise without the extreme of fatigue. Gowers claims that strychnine has proved a powerful check to the progress of progressive muscular atrophy, used hypodermatically, in daily doses at one time of the nitrate, beginning at one-hundredth and increasing up to the one-fortieth of a grain. The effects must be carefully watched. He adds that strychnine by the mouth rarely accomplishes anything. Electricity is useless. Massage is a rationally proper means of treatment, but must be sedulously persevered in. In fact, an incurable disease like this needs the greatest hope to counteract the ceaseless discouragement the patient's condition progressively presents to the physician and the world. Rely on nothing, try everything, but make no promises. Lachesis, causticum, hyoscyamus, gelsemium, and arnica are well worth a trial.

PSEUDO-HYPERTROPHIC MUSCULAR PARALYSIS.

(Muscular Pseudo-Hypertrophy. Hereditary or Juvenile Form of Muscular Atrophy.)

Besides the spinal form of muscular atrophy there is a condition of the muscles in which they waste, though there is for a time an increased deposit of fat to take the place of the disappearing muscle

tissue; but this disease is not dependent on any spinal or nervous affection, and ought, therefore, to be classified among diseases of the muscles properly; but it has been historically so often treated among diseases of the nervous system, and is clinically so closely allied to Progressive Muscular Atrophy, that as a matter of fact its discussion seems to fall in here better than anywhere else. It begins during the developmental period of childhood, and depends on some developmental tendency, inherited, perhaps, but manifesting itself rather in family groups than in one generation after another. Observation seems to show that the maternal influence is greater than the paternal, as children of the same mother by different fathers have suffered.

Males are affected much more than females; and the symptoms never occur after full maturity, generally speaking, before the tenth year.

Pathology. — At the beginning it is wise to caution the student against a too great refinement in distinguishing "types" of this disease. Erb (1884) describes a "Juvenile Form of Muscular Atrophy." Leyden has another, Landouzy and Déjérine a third. All are but various manifestations of the same process, and the diagnosis should be made without regard to "types," though no harm is done by particularizing as to the peculiarities in each case.

The motor nerves are normal, as is also the spinal cord. The muscles are seldom larger, and as a rule smaller than natural; they are pale, and look like masses of adipose tissue; even under the microscope this appearance holds good. The resemblance to a fatty tumor is pronounced except that here and there are found tracts of connective tissue and muscular fibre. Evidently the disease is not due to any lesion of the spinal cord; it is a primary disease of the muscles, an over-growth of interstitial connective tissue, with or without a deposit of fat, with a secondary wasting of muscular fibres. It is a congenital defect which limits and destroys muscle growth, and it is the deposition of fat that causes the (apparent) enlargement of the muscle.

Symptoms. — Impairment of muscular power is first noticed as gradually increasing, without any decided or definite cause. Healthy children attract the parents' attention by awkwardness in walking, jumping, and especially in going up-stairs, and in fact such manifestation is a good diagnostic sign in distinguishing between pseudo-

hypertrophy and spinal muscular paralysis. As a rule the former begins in the muscles of the legs, thighs, rump, and back. The gait becomes progressively harder, wabbling, the abdomen bulges forward, and there is even a lordosis. Most characteristic is the child's attempt to raise itself from the floor. As the gluteal muscles loose power, the child rests on all four extremities, straightening its legs, rests one hand on the corresponding knee, and then by a balance and a final jerk throws the upper part of the body into equilibrium. At first no change in size is apparent, but gradually the muscles appear large, either universally or in groups; the calf muscles are first affected, sometimes attaining a remarkable size, then the recti, the glutei, and the infraspinati. This enlargement (pseudo-hypertrophy, lipomatous) remains stationary, or decreases, till there is an actual atrophy as to both muscle-fibre and size. The hand and arm suffer little or escape altogether.

These diseased muscles are weak, not necessarily in proportion to change in size, though the atrophying muscles are weaker than those hypertrophying.

Electrical reaction is diminished, but never do we find the typical reaction of degeneration. Sensibility is normal, and the sphincters are not impaired. The tendon reflex is gradually lost, as might be supposed from its dependence on proper muscular nourishment and tone. The skin is apt to take on (Struempell) a peculiar marble blue color. Mental symptoms are uncommon. As the disease progresses, contractions (talipes equinas) and spinal curvatures occur. The rate of progress is generally slow, and the patient may lie bedridden for years, till some intercurrent affection or the failure of the respiratory muscles ends the scene.

Diagnosis. — This is not difficult if we remember that pseudo-hypertrophy begins in youth (childhood), as a congenital (hereditary?) affection; that as a rule the leg and rump muscles are first attacked; that there is no reaction of degeneration or the noticeable muscular fibrillary twitching. The peculiar gait and mode of rising should be emphasized.

Treatment.—Symptomatic treatment may be tried and persevered in, but none can be depended on, for the best nervines, as phosphorus, arsenic, strychnine, etc., have been found untrustworthy. Undoubtedly the best rational treatment lies in an attempt to foster strength

and restore the muscular nourishment by exercise, electricity, combined with vigorous massage and passive motion. Tenotomy has given good results in securing greater stability in the upright posture.

SYRINGO MYELIA.

A disease of the spinal cord, characterized by the formation of cavities within the cord, associated with symptoms of amyotrophic paralysis, with loss of heat and pain sensations, but with retained perceptions of touch.

This must not be confounded with dilatation of the spinal canal, for that is normal, or at least only semi-pathological, being either congenital or due to pressure. The cavity in syringo myelia, on the other hand, is irregular in shape, situated generally in the posterior portion of the cord, but spreading to the central portion as it increases. This cavity is caused by the formation within the cord of a tumor of the gliomatous variety, a gliosis, most possibly congenital, and brought into active life by shock, disease, or trauma.

Symptoms.— These are variable and begin gradually; as the gliosis is most apt to be in the cervical region, the arms are usually first affected; there is then weakness in the hands and arms, numbness, then muscular atrophy in one or both hands, quite widespread loss of sensibility to pain and heat, which may be unknown to the patient till examination reveals the fact. Tactile and muscular sense are impaired.

The motor symptoms usually come on after the sensory loss, shown by extreme weakness, but seldom paralysis; unsteadiness of movement. Reflexes are normal, or increased or decreased. Trophic disturbances are not uncommon, as there may be herpes or eczema, or "glossy skin," or a dry hard skin, with little sweat. Circulation is poor, and the bones may be brittle.

Diagnosis.—Signs of amyotrophic paralysis with muscular atrophy and loss of sensations of heat and pain, with retention of sensation of touch, brings a typical case within the bounds of recognition.

Prognosis is grave, but the disease may wear on for years.

Treatment.— Unfortunately the diagnosis can seldom be made till the disease is well advanced, but even then little can be done to

treat the actual condition. Care may prevent bed-sores and stiffness of joints, and cocaine may be used for the pains; other symptoms must be met as they arise.

In this connection mere mention must be made of a remarkable affection first noticed by Morvan in Brittany, and called by his name. Apparently it is analogous to syringo myelia, with an associated peripheral neuritis. Besides many of the symptoms of that disease, there is a peculiar trophic change called by Morvan "painless whitlows," which destroys the nails; the skin cracks, and has a peculiar livid color. A careful discrimination must be made between this and leprosy.

TUMORS OF THE SPINAL CORD.

I need only say here that syphilis, tubercle, and trauma are the most common causes of tumors. In some few cases, parasites have lodged within or on the membrane. Sometimes congenital abnormal growths are found. The tumor may show itself in a syringo myelia (q. v.); or it may give external evidence of its existence; or it may lead to a pressure myelitis. Pain, gradually increasing paralysis, paraplegia, muscular spasm, loss of sensation, and impairment of nutrition, are the most common symptoms. The diagnosis depends so much upon an exact study of the anatomy and physiology of the cord, and the treatment, unless in cases resembling transverse myelitis, is so much a matter of guess-work or of the knife that I shall not stop to discuss it here. The reader can get valuable information from the bibliography.

SPINA BIFIDA.

A congenital fissure of the lower end of the spinal column, combined with a hernial protrusion of the dural sack. This seldom interferes with the birth of the child, though the tumor may be evident, and it is only later on that trouble may be anticipated. The sack is usually filled with cerebro-spinal fluid, and the skin over it is generally red and stretched. If the canal is widened at the same time it is designated as a hydromyelia; pressure on the sack may drive the fluid back into the spinal canal, which shows itself at the fon-

tanelles, and by heightened brain pressure, convulsion, or slow pulse.

If these symptoms are not brought out, the conclusion is justifiable that the tumor is independent of the cord.

The tumor is apt to grow, and parri passu are symptoms of paralysis, anæsthesia, bladder disturbances, etc. If the sack burst, we may expect a purulent meningitis. The treatment belongs to the surgeon, but he is by no means always successful.

NERVE VIBRATION.

[The method of cure of nervous diseases, called nerve percussion or nerve vibration, has become an important part of the therapeutic resources of neurologists. That the reader might become acquainted with this method and its application I asked my friend, Dr. N. B. Delamater, Professor of Mental and Nervous Diseases, to write out his experience with this agent—which he has kindly done in the following article.]

Nerve vibration, as a therapeutic measure, was first proposed by J. Mortimer Granville, of London, about 1876. Since then experiments have been made and a few articles published, from time to time, by others; probably the most prominent article is by Dr. M. Boudet de Paris. My attention was called to the subject in 1883, by J. Mortimer Granville's brochure on the subject published that year. Procuring a percuta from London, I at once commenced a line of experimental work, and have established to my own entire satisfaction that it is a valuable therapeutic agent.

Dr. Granville's claims are based on the scientific principle that all, or nearly all, manifestations of force in nature are the result of vibrations of molecules, or atoms, in the atmosphere. From his book I glean the following arguments and conclusions.

"Nerve action or activity consists in, or is accompanied by, vibrations of essential elements of nervous tissue.

Cells vibrate as bodies suspended in the intercellular stroma of the grey matter, and fibres vibrate as delicately poised rods or strung cords within the partite cylinders formed by internal prolongations of the neurilemma or nerve sheath."

Febrile or other deposits within the nerve sheath, occurring in

the course of disease, or proliferation of the connective tissue, must necessarily interfere mechanically with or entirely interrupt the possibility of vibration.

The solidification called sclerosis causing loss of sensation or power may be an accompaniment or a result of primary atrophy of nerve cell and fibre; in this case proper exercise would increase the nutrition and stimulate the activity of cells and fibres. The almost universal law of organic matter is, that it feeds as it acts and only in proportion to its activity. By inducing and maintaining vibratile motion, the encroachment of solidifying deposits or of proliferation of tissue may be arrested, and in addition absorption be promoted. The essential indication in this class of cases then would be restoration and promotion of mobility of the vibratile elements. There is no way in which this can be accomplished so well as by the application of mechanical vibration.

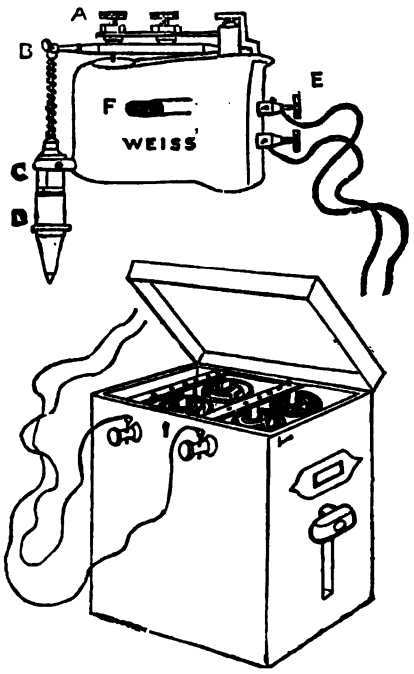
Electricity in various forms has been suggested to accomplish this result, but has not and obviously cannot accomplish the full results desired. Static electricity does not traverse nerve tissue, does not produce or maintain regular continuous vibration in the tissue over which it spreads.

The Galvanic current is a form of vibration or motion closely allied to that of nerve force, but it travels over rather than through the nerve trunk, and produces phenomena of motion or sensation more by its own action than by setting in operation the natural nerve force or motion.

The Faradic current does produce mechanical vibration much more marked than either of the other forms, and while in many of the cases, in which we believe mechanical vibration is beneficial, it has given good results, yet it has not accomplished all that was expected of it. The reason being, probably, that with the mechanical vibration is an added force, which in a measure does, in itself, what we want to compel the nerve to do. In addition the constant change in direction of the current produces an inharmony of rhythm or vibration, while harmony is the one thing that must be obtained to insure healthy nerve activity. By simple mechanical vibration we compel the nerve to act of itself and in the natural physiological way.

I quote these propositions as given by Dr. Granville:

"*First.*— When nervous tissue acts, its essential elements, viz., cells and fibres, vibrate. It follows that by throwing these elements into vibration by mechanical movements, we establish a condition favorable to the discharge of nervous force from the centre affected, and at the same time stimulate the nerve centre, when discharged, to develop new force to compensate the loss of energy expended in exercise.



THE PERCUTA WORKED BY ELECTRO-MAGNETISM.

FIG. 1.— *E*, screws connecting battery wires with the percuta. *A*, screws for making connection. There are two; either may be used. That nearest the hinge of the vibrator causes the hammer to beat at the highest speed. *C*, brass cylinder, through which the rod ot the hammer passes. *D*, vulcanite tube, which is attached with a screw, and regulates the length of the stroke made by the hammer. *F*, button which, being pressed or pushed with the finger, sets the percuta going.

Second.— The vibration of nervous elements being a purely mechanical process, it must be comformable to the laws or conditions that govern the vibratile movements of other bodies, whether organic or inorganic — as reed instruments,— and vibrations of cells and fibres should therefore be amenable to the laws of concord and dis-

cord. In short, what Newton discovered and taught in explanation of the phenomena of light and sound, with the recognized correlation of the diatonic and chromatic scales, must be equally applicable to an as yet unrecognized but doubtless existing scale of nerve vibration, and such affinity must exist between the nature of vibrations, whether in afferent, sensory, or efferent, motor nerves. These effects are capable of demonstration, producing changes in the rate and rhythm of nerve vibrations precisely correspondent with those which would be effected in the vibrations of unorganized substances, by the operation of the same or similar agents working in like process.

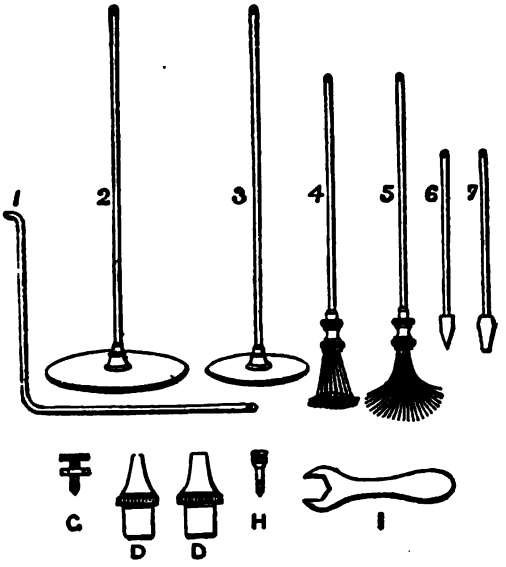


FIG. 2.— *1*, bent hammer; *2*, large disk, for use in water; *3*, small disk; *4*, hard brush. This brush grew out of a suggestion made by Dr. Hugh Campbell, and is very effective; *5*, light brush for relief of superficial pain and to redden the surface; *6*, pointed hammer; *7*, flat-headed hammer. *G*, connection screw, tipped with platinum; *D D*, vulcanite tubes to protect hammers; *H*, screw to attach hammer to percuta; *I*, clamp to fix connecting screws.

Dr. Henry F. Gary, of Baltimore, has applied this theory to the treatment of deafness dependent on abnormal deposits, or proliferation of tissue, interfering with the power of motion in the hearing mechanism. Clinical experience reported by a large number of aurists has fully demonstrated that it is possible to induce absorption of inflammatory deposits or proliferated tissue by pure mechanical

vibration, the restoration of function following as a natural sequence.

Thus we see that when vibrations of normal rhythm and frequency are conveyed and imparted to the auditory nerve, and only then, it performs its functions properly.

Since 1883 I have experimented with mechanical vibration of nerve and feel confident that it now deserves a prominent place among therapeutic measures. My use of it has been confined in the main to cases of sclerosis of the cord and to such other organic and functional neuroses as are not usually considered amenable to other known methods of treatment.

I first used the percuta of Dr. Granville made in London; later I was able to get as good results, with a less cumbersome instrument, by having an electrical dental hammer fitted with suitable points.

For application to the ear the vibrometer of Dr. Gary is, I think, in quite general use among aurists. In it an attempt has been made, and with some degree of success, to tune the instrument to a correct number of vibrations per second, to suit individual cases, but no satisfactory data for or method of tuning has been evolved except for the ear.

Special directions for some of the more important diseases will be found in the articles on them. There is an objection to this line of treatment that I fear will be very potent in the future, as it has been in the past — the time and close attention required in order to produce desired results. The treatment must be given daily, with great care as to uniformity of pressure, order, and time.

The operator should commence at the same point and follow from point to point in the same order at each sitting. He should note accurately the length of time the hammer is held at each point, and make it uniform each day. It is better that treatment should be given as near as may be at the same hour. In using nerve vibration for the cure of neuralgia, the hammer should be placed over a specially sensitive spot, if there be one, or over the point where the affected nerve lies nearest the surface; at first it is quite likely to very materially increase the pain; it is to be held firmly and steadily, and in a minute or two the pain may abate. It is my experience that the best results are obtained by stopping the application just as soon as fully satisfied of amelioration. I have seen many very sat-

isfactory results in long-standing cases that I had failed to reach by other means.

In spasmodic motor cases I have used this treatment very little, as I have usually found other means, requiring less of my time and less expensive to the patient, efficient. Several European physicians, however, report very favorably on its use in chorea and other disorders in which irregular motor spasm, either local or general, is a prominent feature.

In these cases, if application be made while irregular and involuntary motion is present, there is likely at first to be an exaggeration of the motion, followed by a subsidence and in a short time entire cessation of the motion. If application is at the time of quiescence, there is likely to be at first some spasmodic actions, followed very soon by quiet. In all cases, except for immediate relief of an evanescent disorder, the application should be regular and daily.

I have never used it for the relief of constipation, although Dr. Granville has cured a number of stubborn cases. I have had some brilliant results in cases of evanescent functional paralysis. Also in several cases of spinal exhaustion, two or three of them accompanied by sexual weakness. The percuta or nerve vibrator may be run by electricity or by clock-work.

CHAPTER X.

INTESTINAL PARASITES.

ASCARIS LUMBRICOIDES.

"THE long round worm, often called lumbricus, is a large nematoid worm of a yellowish red color. The female is fifteen inches, and the male ten inches in length. The body is cylindrical, tapering to either extremity, but more rapidly towards the head. The mouth is triangular, having three lips. It is armed with numerous (about two hundred) microscopical teeth. The alimentary canal is simple, without division between stomach and intestine. The tail is conical and pointed. In the male it is curved like a hook towards the ventral aspect of the body; in the female it is straight. The eggs, which are excessively numerous in each female specimen, are oval in shape, and have a thick, firm, elastic, brownish shell, which is usually nodulated on the surface. In these ova the embryos develop very slowly, for Davinne kept some alive for five years without perceiving any attempt of the immature tenants to escape from the shell. These embryos have a curious tenacity of life, for they cannot be destroyed by frost or complete desiccation. It has been doubted whether the eggs can be hatched, and the embryos escape and pass through their developmental stages to maturity in the alimentary canal of the subject infested by them. It appears, however, from the researches of Heller that this is possible. The lumbricus inhabits the smaller bowel, but is migratory in its habits, and has a peculiar tendency to wander. The worms have been consequently found after death in very curious places. They have been seen in the nasal passages, in the larynx and bronchi, in the ducts of the liver and pancreas, in the gall-bladder, and even in the cavity of the peritoneum, and in the interior of abscesses communicating with the abdomen. The worm has no power of penetrating the living tissues, but can pass through an ulcerating lesion of the vermiform appendix,

and set up peritonitis by entering the cavity of the abdomen." (Eustace Smith, "Diseases of Children.")

The ova of the lumbricus appear to be imported through the medium of impure water. This parasite is said to be especially common in low-lying, marshy districts.

Symptoms.—"The lumbricus, on account of its large size and its habits of nocturnal activity, is a cause of considerable irritation. This worm is said frequently to give rise to nervous disorders in the child; and cases have been recorded in which severe headache, photophobia, choreic movements, convulsions, and even profound coma have ceased on the expulsion of a number of these creatures. It is difficult to say what share the worms take in the production of such symptoms. Probably some additional cause is in operation, for in rickety children, whose tendency to convulsions and other forms of nervous disturbances is one of the most characteristic consequences of that phase of general malnutrition, I have not noticed that the presence of the long round-worm is especially liable to be accompanied by eclamptic seizures. Probably in most cases where nervous symptoms are associated with intestinal worms the nervous disturbance is quite independent of any irritation produced by the worms in the bowels. It is common enough for children who are suffering from undoubted disease of the nervous centres to be infested with lumbrici. Thus, in cases of tubercular meningitis, one or more long worms are often expelled by the action of aperients; but it is needless to say that in such a case no amelioration in the symptoms follows the expulsion of the parasites. So, also, children under my care suffering from chorea have passed lumbrici, but I cannot call to mind a single case where any improvement in the disease has directly followed the appearance of the worm in the stools. If, however, the nervous symptoms supposed to be produced by lumbrici must be looked upon as somewhat problematical, there are other phenomena which can be referred with much greater certainty to the irritation set up by the entozoa. Severe abdominal pains of a colicky character are not uncommon in children who suffer from these creatures; and looseness of the bowels, occurring chiefly at night, is occasionally produced by this agency. I have seen several cases of this kind where a diarrhœa, after persisting for months, ceased immediately that the worm was got rid of."

"A little boy, aged four years and a half, was said to have been troubled for three months with persistent looseness of the bowels. The purging was never very severe, but always worse at night. The motions were said to be very slimy, and after a dose of oil, usually contained thread-worms. The child often complained of colicky pain and tenesmus. He had been slowly wasting from the time the purging first began. The occurrence of nocturnal looseness of the bowels, combined with the appearance of the tongue, which was very flabby, slimy, and drab-colored, with large fungi form papillæ at the sides of the dorsum, made me suspect the presence of a long worm. I ordered a powder, containing one grain and a half of santonine and a half grain of calomel, to be given every night for three nights, and to be followed each morning by a dose of castor oil. After the first powder the child passed a long worm, and the diarrhœa ceased from that time. He then rapidly regained flesh." (Eustace Smith, "Diseases of Children.")

As a rule, lumbrici become active at night, and may pass upwards into the stomach, or downwards into the colon and rectum. They have been known to issue spontaneously from the mouth of a child during sleep, or to appear from the bowel without being discharged in a stool. Their presence in the stomach may give rise to nausea and retching. Sometimes they pass into the common bile-duct and cause jaundice, by obstructing its channel. If jaundice rapidly develops in a child who is known to be troubled with this parasite, we should think of the possibility of this rare accident having happened. Sudden dyspnœa has been known to arise. In some instances, at least, this has been discovered to be due to the actual penetration of the worm into the air-passages. Thus, Andral has known death to occur from this cause; and Arronsshon has reported the case of a little girl, aged eight years, who, after suffering for two hours from distressing dyspnœa and cough, suddenly, after a violent paroxysm of cough, ejected a long worm and was immediately relieved. In other cases, the difficulty of breathing has been attributed to direct pressure upon the larynx and trachea by a number of worms in the gullet, or to reflex action, propagated from the intestines; but these explanations are neither of them very satisfactory. It has been so much the tendency to attribute every kind of discomfort arising in cases where worms are present to the irritation of parasitic creatures

in the bowels, that probably sufficient care has not always been taken to exclude other and less obvious causes of the symptoms.

Lumbrici are sometimes present in very great quantities. The largest number I have known to occur together in one child has been twelve; but they are sometimes much more numerous, and may even amount to several hundred. When thus multiplied, the worms may form bundles, which impede the passage of the contents of the bowels, and are said in some cases to give rise to the symptoms of obstruction." (Eustace Smith, "Diseases of Children.")

Treatment.— The treatment of worms by the radicals of our school excludes their expulsion; a rule I cannot accede to, because when they accumulate in large numbers they may cause convulsions and other serious symptoms. In Hahnemann's preface to the pathogenesis of cina he says: "For centuries this important drug has been used to expel worms, being given in doses of ten, twenty, thirty, and sixty grains. I shall say nothing of the dangerous and even fatal consequences attending the administration of such doses, and I would merely make the passing remark that a few worms in lively (healthy) children cannot be considered an important disease; they are quite common in childhood, and cause but little inconvenience in an age when the psoric miasm is yet in a latent condition. On the contrary, however, when worms are found in large quantities they originate in a morbid condition of the system, in the psoric miasm which has been roused from its latent state, and which must be cured, otherwise the worms are speedily produced."

He denounces the expulsion of worms, which seems to me very illogical. Why not expel them, and then remove the morbid state of the intestinal secretions? Psora, as Hahnemann taught, is but another name for anæmia, scrofula, and tuberculosis. Worms are generally present in these conditions. Remove these and the worms if expelled will not be reproduced. Guernsey (Obstetrics) mentions thirty medicines for worms, because each possesses some symptoms that may be caused by worms. Of these thirty, only calcarea, cina, silica, sulphur, and teucrium are of much value. To these I would add chenopodium, salicin, salicylate of soda, naphthalin, and carbonate of creosote, each given in one to five grains of the 1x or even the crude drug, before or after meals, and if the child is constipated followed by colon flushing, or a mercurial laxative. If the

patient is old enough to swallow a capsule, the following formula is very efficient:

℞ Merc. dulc. . . . . gr. xx.
Santonine . . . . . gr. x.
Papoid . . . . . gr. xx.
Fill ten capsules. Give one before each meal.

For young infants make thirty powders of the above, and give one three times a day.

OXYURIS VERMICULARIS.

"*Description.*— The small thread-worm, often called seat-worm, belongs to the order nematoda. To the naked eye these worms have the appearance of fine white threads. Both female and male specimens exist together, the former being the larger. In both sexes the anterior part of the body is of fusiform shape. It is narrowed towards the head, which is abruptly truncated, and provided with three tubercles. The male is one-sixth of an inch in length. Its intestinal tube extends the whole length of its body, and terminates in the anus at about the middle of the tail. The tail is arranged in a spiral form. The penis is minute and hook-shaped. The female measures nearly half an inch in length. Its body ends in a long tapering tail, which is three-pointed at the end. Under the microscope its uterine ducts can be seen to contain a multitude of ova. The eggs are long and unsymmetrical. They may be readily hatched by exposing them to the sun in a moistened paper envelope, as in the experiments of Vix and Leuckart. When this is done, tadpole-shaped embryos escape after five or six hours, and rapidly develop into slender worms. It appears from the researches of Leuckart and Heller that the embryos can escape from the ova in the human body. Heller states that their liberation takes place in the stomach under the influence of the gastric juice. From the stomach the creatures pass into the duodenum and upper bowel, growing rapidly as they descend the alimentary canal; and by the time they reach the cæcum have arrived at sexual maturity."

Causation.—"The means by which thread-worms gain access to the human body is by the direct passage of the ova into the mouth. The eggs are often introduced clinging to fruit, cresses, and various articles of food. But they may also be directly conveyed to the

mouth by the patient himself. It has been said that the embryo is liberated from the egg in the child's stomach by the action of the gastric juice upon the ovum. It has also been stated that each individual female worm contains in itself a multitude of eggs, which pass out in large quantities with the stools. The embryos are probably not liberated from the ova in the bowels; but if the ova are reintroduced into the alimentary canal by the mouth, they become exposed to the action of the gastric juice in the stomach, and their contents may be set free. According to Dr. Cobbold, children frequently carry the ova under their nails; for the irritation to which the presence of the oxyures gives rise obliges them to seek relief by scratching. In this way the eggs may be transferred directly to the mouth.

Symptoms. — "In the case of thread-worms, the patient seldom complains of abdominal pain, but the irritation set up in the rectum by the presence of the entozoa gives rise to a troublesome itching of the fundament, which in sensitive children may cause an extreme degree of suffering. This irritation comes on towards the evening, and at night may be so distressing that sleep is greatly interfered with. In some cases, in addition to the itching, shooting pains may be complained of in the same part. Catarrh of the rectum is not uncommon in such subjects. There may be looseness of the bowels, and the evacuations are often discharged with straining efforts. They may be followed by prolapse of the rectum. The stools often contain glairy mucus, and sometimes blood in streaks, or even clots of considerable size. Difficulty in emptying the bladder may be a consequence of the irritation, and the child sometimes holds his water for many hours together. Itching of the nose, a leaden tint of the lower eyelid, and swelling of the upper lip, are also very common symptoms when thread-worms are present." (Eustace Smith, "Diseases of Children.")

In addition to the above, I will state that I have had several cases of leucorrhœa in children and women, which I discovered were caused by the presence of pin-worms in the vagina. There is no reason why they should not migrate into the uterus and bladder. Such cases I think have been reported.

"In the course of a clinical lecture on 'Thread-worms in Children,' published in the 'Clinical Journal,' Dr. Sansom said:

"As regards treatment in the case of the hosts of oxyurides, the

indications are: (1) to expel the intruders and all their ova; (2) to prevent the entry of ova into the alimentary tract. The total expulsion of the parasites is no easy matter. It is important to keep up for several weeks a frequent aperient action; castor oil, sulphate of magnesia, rhubarb, or other simple aperients, may be employed for this purpose. If the parasites present at the rectum, or if there be local symptoms hereabout, an enema is decidedly indicated, but the old notion that such clyster treatment is the plan to be adopted in all cases, is quite erroneous. The habitat of the oxyuris is not the rectum only, but the whole large intestine; in fact its headquarters may be said to be the cæcum. It is obvious that ordinary enemata cannot reach so far. In rebellious cases special apparatus whereby the whole intestines can be irrigated is recommended. Such is Hegar's tunnel system apparatus. Nothing is better as a destructive agent than warm or cold (pure) water — in water the parasites swell up and burst. A solution of soap is sometimes recommended. After a general clearance by purgatives and enemata, it is well to instruct the parents to repeat the latter about once a week, even when the child seems in good health. With this purgative line of treatment it is, in my opinion, very important that a tonic plan should be joined. Indeed, I think the facts show that a double cause exists for the accumulation of these intestinal worms, and for the effects which they produce. So long as the ova of the parasites are imported into, or even by a chance develop in, a healthy intestine, they manifest no ill-effects, because the vigor of the intestinal movement never allows them to accumulate. Let there be, however, from any cause, a paresis of the bowel, or a development of the mucus in which they can become concealed, and then they become the dangerous pests that I have described. The moral is: Coincidently (or commencing very shortly after the expulsive efforts) administer iron tonics with, in some cases, strychnine or nux vomica, with a view of not only restoring the blood-making functions, but of giving strength to the weakened intestines. Finally, as regards preventive treatment, without which all other means are of no avail, at the outset insist on scrupulous attention to diet. All the milk given and all the drinking-water should be previously boiled, for ova of ascaris lumbricoides can be imported by these vehicles. So, also,

all the meat given should be well cooked. Especially all the food should be clean. It is through the soiled fingers of human kind that the ova are chiefly distributed; any article of food, therefore, which passes through many hands, or is liable to be touched by dirty hands, suspect. I am very much inclined to think that brown sugar is a vehicle for importation—therefore I order white sugar to my patient. Above all, try to indoctrinate habits of strict cleanliness as regards the little patients themselves. With the view of killing ova, I order tar or carbolic acid soap to be used for the frequent washing of the body, and I make the parents keep the children's nails short, and brush them many times a day with tar-soap water. It is undoubted that the supply of the parasite is kept up by the conveyance by the fingers of ova from rectum to mouth. Alas, it is not always that these lessons can be adequately enforced, though I must say that among the poor I found rebellion against carefully expressed rules exceptional. The mothers of hospital patients are willing, for the most part, to learn, and glad to be taught. You may think my precautions unnecessarily minute; but I hold that the treatment of the affections to which I have directed your attention is on a par with the antiseptic method in surgery."

The above advice, even the treatment modified as regards drugs, is sensible and practical. The use of colon flushing—if simple water destroys the parasites — is as important as it is harmless. I prefer hydrastis 1x and ferrum mur. 1x to any other form of intestinal tonic in children.

The homeopathic symptomatic treatment will be of value when the intestinal secretions are at fault, but it does not expel the parasites. If we restore the intestines to the normal state the worms will become quiescent. It should be remembered that children may present an assemblage of symptoms exactly resembling those caused by worms, but proceeding from other causes, such as cerebral irritation, catarrh of the stomach and intestines, etc. For this reason it is always good practice, unless worms are discovered in the stools, to prescribe for the symptoms before we resort to vermifuges. If we desire to kill and expel these worms, santonine or napthalin 1x in doses of one to five grains, followed by mercurius dulcis 1x or castor oil, must be used.

TAPE-WORMS AND CYST-WORMS.

"Tænia solium and cysticercus cellulosæ cutis. The tænia solium is one of the most common of human tape-worms. In its perfect condition it usually measures from seven to ten feet long, but often exceeds that length. Its head or scolex, which is about as large as a small pin's head, or, to be more exact, between 1-45th and 1-35th of an inch in diameter, is succeeded by a delicate thread-like neck, which, gradually becoming broader and flatter and wrinkled transversely, merges ere long in the distinctly jointed body. The joints or proglottides are in the first instance much broader than they are long; but gradually with their increase in size this relation ceases; and although they still get broader, their length throughout the greater part of the strobilus exceeds their breadth. Towards the lower extremity, the quadrilateral joints measure on the average a quarter of an inch wide by half an inch long. The globose head presents four projecting suctorial discs placed at equal distances upon and a little above the equator; and springing from its pole a rounded elevation, or rostellum, the margin of which is furnished with a double circle of hooks. The apparently homogeneous neck may be seen under the microscope to be transversely wrinkled at a very short distance from the head. The tænia solium is essentially an inhabitant of the small intestine, to the mucous surface of which it fixes itself by its hooklets and suckers. It is usually, as its name implies, solitary; but two, three, or more are not infrequently associated, and occasionally much larger numbers. From the time of its entrance into the bowel until it reaches its full development, a period of three or four months usually intervenes; and it may live in the bowel for many years, during which time it is constantly shedding its ripe proglottides and discharging ova into the alimentary canal."

"The cysticercus cellulosæ is chiefly known as a denizen of the flesh of pigs, in which it is sometimes present in vast numbers, rendering the pork 'measly.' And it is almost exclusively to the use of such, in an uncooked or imperfectly cooked condition, that the development of tænia solium in the human intestine is due. In the comparatively rare cases in which the cysticercus infests the human body, it seems to occur mainly in the muscles, connective tissues, brain,

eye, and serous membranes. It exists under the form of a round or ovoid vesicle, about the size of a pea or bean, but sometimes attaining that of a marble, formed of a transparent elastic membrane, containing a clear limpid fluid. Springing from one side of this vesicle is a wrinkled cylindrical neck, terminating in a head precisely similar to that of the tænia solium. The neck and head protrude externally after death, and may be made to protrude by pressure during life; but in the ordinary living state, they are retracted within the vesicle, lying coiled up against one side of it. The conversion of the six-hooked embryo into a perfect cystic scolex occupies about two and a half months; and the scolex may remain living in the tissues of its host for many years.

"*Tænia mediocanellata, and cysticercus tænia m c.*—This tape-worm, which was formerly confounded with the last, is equally common. It presents a general resemblance to it both anatomically and in habit; but it presents also characteristic differences. It attains a greater length, its joints are longer and broader, and its head also is two or three times as thick. The head, moreover, is furnished with four large round pigmented suckers, but with neither rostellum nor armature of hooklets; the uterus, though exhibiting the same general arrangements as that of the tænia solium, is characterized by much more numerous and finer transverse processes; and the ova, instead of being round, are oval, the long diameter differing little from the diameter of the egg of the tænia solium, the shorter diameter measuring about 1-850th of an inch.

The cysticercus of this tape-worm seems especially to affect the ox, and it is, therefore, to the eating of imperfectly cooked beef that the introduction of scolex into the intestines is due. The cysticercus is a small oval vesicle, similar to that of the cysticercus cellulosæ, but smaller than it, and furnished with a neck and head, of which the latter is identical with that of the adult sexual strobilus. It is not known to affect the human being.

"*Bothriocephalus latus.*—This tape-worm is limited in its range to certain European countries, especially Belgium, Holland, Poland, Prussia, Russia, Sweden, and Switzerland. It is the largest of all tape-worms, not infrequently attaining a length of twenty-five feet and upwards, and a breadth of more than half an inch at its widest part. The head is ovoid in form, measuring about 1-10th of an

inch in length by 1-26th in breadth, and presenting two opposite longitudinal deep grooves or suckers, but no hooklets. The neck, which is comparatively narrow, soon becomes transversely wrinkled; and as it widens out and retreats from the head, the wrinkles divide it into successive segments. The segments gradually increase in all their dimensions, but for the most part continue of greater width than length; and are specially characterized not merely by their general form, but by the fact that the genital pore is placed in the centre of each flat surface, and that the uterus forms a small rosette, of which this pore is the centre. The ovum never become matured within the uterus, and usually escape thence into the bowel, while the proglottis is still a portion of the strobilus. After the discharge of their ova, the joints diminish in size, and become shrivelled and elongated. The eggs are of oval form, measuring about 1-370 of an inch by 1-570th, and have a firm brown shell, which opens by a lid at one end. The embryo on its escape from the egg is provided with cilia, which it soon loses, and then presents the common six-hooked character. The cysticercus of this tape-worm has long been believed to infest some fish or other aquatic animal. The correctness of this surmise has been established by Dr. Braun, of Dorpat (a locality where the worm is comparatively common), who, on examining the fish brought to market, discovered that the muscles, with the liver and other viscera, of the pike and eels were in large proportion abundantly invested with the scolices of the parasite. Moreover, on feeding dogs and cats with the infected tissues, bothriocephali were developed in their bowels.

Symptoms.—"The symptoms to which tape-worms give rise are on the whole trivial and unimportant. Many of those who are infested by them enjoy perfectly good health; and many more make them the scapegoats of all the ailments (imaginary or other) from which they happen to suffer during the residence of these parasites within them. Among the symptoms which are referred to their presence are: pain and discomfort in the belly, capricious appetite, variable condition of bowels, itching at the nose and anus, depression of spirits, emaciation, and hysterical, epileptic, or other nervous phenomena. The list might easily be extended; but when we consider that, notwithstanding all the evil influences which have been attributed to them, they are probably never diagnosed or even suspected to be pres-

ent until their joints have been detected in the stools, it is obvious how vague and on the whole how apocryphal all these influences are. The only way in which the presence of tape-worms can be absolutely recognized is by the discovery of their joints either in the stools or about the anus or on the body-linen, and of their eggs by the microscopic examination of the fæces.

"The cysticercus cellulosæ causes no symptoms unless it be lodged in some delicate or vital organ, such as the eye or cortex of the brain, and even then the symptoms are not specific." (Bristowe.)

Treatment.—The treatment of tape-worm is uncertain, because the drug that will destroy and expel it in one case will not in another. It has been supposed by some that intestinal parasites cannot exist or gain lodgment unless there is some abnormal condition of the intestinal secretions which favor their life. Those who favor this opinion assert that we need not attempt to destroy the worm; that we should use medicines which are supposed to remove the diseased condition of the intestinal canal. On the other side are found those who believe that parasites exist only in the healthy intestine, and leave or are made ill by any disease of that tube. In this way they account for the convulsions and other nervous phenomena which appear when worms infest the intestines. I am inclined to the latter theory, although I admit that worms may propagate to such an extent that their numbers may cause disease conditions. These theories are not as applicable to tape-worm, as to the other parasites — ascaris and lumbrici.

My experience has been that when we combine a symptomatic with a parasiticidal treatment we shall meet with the best results. There are but few trustworthy remedies for tape-worm. If we desire their death or expulsion, the oleo-resin of male fern (Felix mas.) has long had a good reputation. It has been used in doses from 30 to 120 minims, given in the early morning before eating and followed shortly by a dose of castor oil. These doses have, however, caused violent and dangerous symptoms. I begin with ten drops, and if no segments appear, increase to twenty drops. If no good results appear after four doses, it is not the remedy.

Granatum (bark of the root of pomegranate) is sometimes efficient. In the doses prescribed until lately—four ounces of a decoction of the fresh root—it is intensely unpalatable, but a French chem-

ist, Tanret, has isolated from the bark an alkaloid called pelletierine which is an active tænicide. On animals it acts like curare, causing paralysis of the motor nerves. It may act on the tape-worm in the same manner. The dose of this alkaloid is one to four grains, according to the age of the patient. It should be given fasting, or on a scant milk diet.

Kamela comes from India, where it is largely used for tape-worm. It is an active purgative and needs no adjuvant. The tincture, in doses of ten to twenty drops, can be given every four hours until its laxative effects appear.

Kousso (an Abyssinian drug) can be given in doses of half an ounce of the powdered flowers in the morning, fasting; or the alkaloid koussin, in doses of ten to twenty grains wrapped up in a wafer. It is said to be unsafe to give to pregnant women.

Salicylic acid is said to have destroyed tape-worm. For adults give three grains every hour or two until twenty-five grains are taken, then give a purge.

Thymol has been successfully used by Italian physicians, who give it as follows: "Half an ounce of castor oil in the evening; the next morning two drachms of thymol, divided into twelve doses, one to be given every quarter of an hour, and twenty minutes after the last dose, another dose of castor oil."

Cocoanut has lately gained some reputation. Various medical journals have reported cases of expulsion after a few days' exclusive diet of grated cocoanut. It is certainly a harmless and agreeable remedy, and should be further tested.

Pumpkin seeds have gained a deserved reputation. I have used them successfully in many cases. Two ounces of the seeds may be bruised in a mortar; sugar and a little cream added. This dose should be taken at 9 P. M., after a light supper of bread and milk, and the same dose in the morning before breakfast. A few hours after this last dose an active purgative—castor oil, Rubinat water, or Epsom salts—may be given. Dr. Wolff asserts that the active principle is a resin which is effectual in a dose of fifteen grains. Dr. Heckel's investigations show that the fourth coat of the seed, starting from the outside, *i. e.*, the coat next the meat, contains the active tænicidal principle (the resin), and not as had been supposed, the fatty oil in the meat.

It should be remembered that the patient is not really cured of his parasite until the head of the worm has been expelled, for if the head is left it will soon propagate another worm. The thread-like portion should be carefully examined with a magnifying glass before it is decided that the head has been expelled. Even then, the neck is so delicate that it may have been detached and lost after its expulsion.

Tribromphenol is recommended by Dr. Gruum. He says one-half to three grains will expel the tænia mediocanella and the bothriocepholus lata. He gives only one dose.

I have expelled several tape-worms with the following: ℞—Oleo-resin, male fern, two drachms.; croton oil, two drops, in half an ounce of an emulsion of acacia, one-half was taken in the morning, fasting. The worms measured twenty and thirty feet in length.

Creolin has been used successfully. Dr. Engelke, of Brazil, uses it as follows: fifteen minims of creolin mixed with powdered licorice root, and given in the evening and early in the morning. The first dose is preceded by a cold infusion of senna. The worm is expelled a few hours after the morning dose. Instead of the senna I would advise adding a drop or two of croton oil to the last dose of creolin.

Dr. Stephen reports the expulsion of tape-worms by means of chloroform, even where all other tænicides had been employed in vain. He applies the following formula:

℞ Chloroform . . . . . grms. iv. (fl. dr. i.).
Syrup . . . . . grms. xxx. (fl. drs. vi.).

To be taken in four parts at 7, 9, and 11 o'clock in the morning and at 1 o'clock in the afternoon. The patient also takes thirty grms. (one fluid ounce) of castor oil at noon. The chloroform was always well borne, it is stated.

Many years ago I remembered to have read in one of our journals, the 30th dilution of male fern seriously recommended for tape-worm. Anyone conversant with the history of the origin and development of this parasite in the human body must consider such a prescription as verging on the ridiculous. As well might the 30th of arnica or calendula be prescribed for a wound in which remained a splinter or any foreign substance; or any internal medicine to expel a tick or jigger from the skin. I could not believe any physician now living held to any other belief, and was prompted to write to one who, if any, claims to represent the original teachings of Hahnemann. In reply to a letter of inquiry, I received the following. I

give it without a word of comment, which I think is unnecessary.

"The tape-worm is as easily eradicated as the pin-worm, and in precisely the same way — by the constitutional remedy. It may require more time, but the longest way round may be the safest way home. In my experience, the forcible expulsion of the tape-worm does not remove the cause (?) and should be placed on the same basis as cauterizing a chancre or suppressing a gonorrhœal discharge. It never cures. It may produce a metastasis; it cannot rid the patient of sickness."

THE END.

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