A SKETCH

OF THE

TREATMENT OF CHOLERA

BY

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SECOND EDITION

(Revised and Enlarged.)

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PREFACE TO THE SECOND EDITION.

In March 1903 my late father commenced the second edition of this book. It was then upwards of thirty-three years, since it was first published. A year or two after its publication, the book was out of print and solicitations from different quarters for a second edition, came to the late venerable doctor, who, in spite of his desire to publish the second edition, had not time to put his hand in, as he was then busily engaged in founding the Indian Association for the Cultivation of Science, and giving it a firm footing. To maintain the Institution he had to lecture there every week for upwards of twenty years in addition to the onerous duties of its Honorary Secretary. He had besides other public duties and arduous professional call which hardly left him any time to think over the matter.

In January 1901 the doctor's urinary difficulty, due to the enlarged prostate, became very severe, and from that time till his death on the 23rd of February 1904, he was confined to his house, but the vigour of his mind and intellect remained unimpaired to the end. He devoted his energies, in spite of severe tormenting pain due to the disease, to the *Calcutta Journal of Medicine*, which was started by him in 1868, and published regularly every month. During this period he published the third edition of the *Therapeutics of Plague*, having considerably revised and enlarged it. He then turned his attention to the preparation of the second edition of his *Treatment of Cholera*, and the first instalment was published in the March number of the *Calcutta Journal of Medicine* of 1903. From that time till January 1904, when the book was completed, it appeared regu-

larly in the pages of this Journal. The book, which is now before the public, was considerably revised and enlarged by the author after its publication by parts in the Journal, with the exception of the last ten pages, which he did not live to revise, and which have now been left as in the first edition. It has assumed treble the size of the first edition, and new matters such as the history and the up-to-date Bacteriology of the disease have been added. The portion dealing with the treatment of the disease has been greatly enlarged, and contains the result of his long and mature experience.

It is needless, or rather I should say, it would be impertinent on the part of one like myself, to pronounce any opinion on the work here. The excellent fruit will itself show the vastness of erudition, the acuteness of observation, and the marvellous assimilation of everything good, of the author. As a physician, he always kept his mind open, accepted everything based upon sound reasoning, and never allowed himself to be swayed by rash theories or stolid dogmas.

CALCUTTA :
June, 1904.

A. L. S

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PREFACE TO THE FIRST EDITION.

We have ventured to reprint, from the *Calcutta Journal of Medicine*, the following Sketch of the Treatment of Cholera in the hope that it may be of use to practitioners who have recognized the value of the Law of Similars as the best guide-law in Therapeutics yet discovered, and that it may lead other practitioners to think of homœopathy when they fail with their own system.

Our experience of this disease extends over upwards of ten years,—with the Old School methods for the first seven years, and with both the Old and New School methods for the last three years. On which School we have drawn the largest for therapeutic resources, the Pamphlet itself shows. Nevertheless it will be evident that we are partial to none. In every instance our anxiety has been to save life and relieve suffering. We have here given simply the results of our experience, and we have not hesitated to recommend any measure or any remedy which that experience has shown us to be calculated to bring about either of these ends.

It is true that the Old School, with all its heroic armamentaria, stands aghast in utter hopelessness and helplessness, as it were, before cholera; it is true that this dire disease, this greatest plague of modern times, has been the very pioneer of the New School throughout the world. Nevertheless we believe that we cannot altogether dispense with allopathic resources, that we cannot always succeed with dynamic remedies or remedies which address themselves chiefly to the nervous system. We do not

speak of solitary cases which might recover under, or in spite of, any system of treatment, but we speak of cases in the aggregate. Systematically and determinedly to treat cholera with one system of medicine, and one system alone, be it even homœopathy, or rather as we should say, homœopathy as generally understood at present, will not, we deem it our duty to declare, be attended with the maximum amount of success attainable by a judicious combination of all the resources of our Art.

We know it to our cost that this is not acceptable to followers of *systems* of medicine; we know that our ideas are very often misunderstood, and that we are looked upon as attempting to amalgamate things which like the iron and the clay in Nebuchadnezzar's feet will not unite. We humbly submit this is not so. The question is not one of "system *versus* the life of our patient," but of "cure *versus* disease." If in the presence of any disease human pride is humbled, and the physician awakened to a sense of the awful responsibility of his calling, it is in that of cholera; and if the physician is truly awakened to a sense of his responsibility, and if he is at the same time aware of the imperfection of the system, whatever it may be, which he practises, he cannot but feel that he is bound to avail himself of the accumulated clinical experience of the world which is too valuable a treasure to be altogether thrown overboard.

It needs no very profound observation to tell us that the science of therapeutics is yet far from perfect. We have certainly arrived at one generalization which has revolutionized the science as it was three quarters of a century ago; but we believe others have yet to be arrived at before we can expect it to be a complete superstructure. To this end we must collect facts from all the systems of medicine.

The human organism is governed by a variety of laws; its disorders therefore are manifold, proceeding from infringement of one or more or all of these laws: and consequently the

therapeutics of these disorders must recognize the operation of all these laws. The great difference between the Old and the New Schools of Medicine consists in the one generally ignoring the vital or dynamic laws, and the other the mechanical and the chemical laws, which all combine in maintaining Life. This we look upon as a serious and mischievous error, and unless each school will make ample concessions, unless each will condescend to learn from either, we cannot expect their re-union, nay we cannot expect a perfect therapeutical science; on the contrary, there will be a perpetual war of school against school, of system against system, to the great detriment of the Profession and misfortune of the human race.

CALCUTTA:
February, 1870.

M. L. S.

CHOLERA AND ITS TREATMENT.

CHAPTER I.

NATURE OF CHOLERA.

Of all diseases which assume the epidemic form Cholera is the swiftest and the most widespreading in its destructive energies. There is hardly a part of the habitable globe which it has not visited and devastated. If there are still regions which have escaped its invasion it is because of the accident of their isolation from the centres of infection.* With increased facilities of intercommunication, the isolation and with it the immunity will cease. However and wherever it might have originated in the remote past, India, Bengal in particular, is now its chosen endemic home. It is a disease, therefore, which it behoves Indian physicians to study with particular care.

DEFINITION.

CHOLERA is a disease in which primarily there are profuse, tempestuous, downward and upward watery evacuations from the bowels and the stomach, and secondarily there are other symptoms which accompany or follow as a necessary consequence

* "In the case of isolated countries the absence of active and frequent intercourse with the outer world favors immunity, even during approximately pandemic extensions. Thus, though near the home of cholera, the Andaman Islands have never been visited by the disease. Similarly, Australia and New Zealand hitherto have enjoyed practical exemption. The same can be advanced of the Pacific Islands, the Cape of Good Hope, the West Coast of Africa, Orkney and Shetland, Iceland, the Faroe Islands, and many of the islands of the Atlantic." (PATRICK MANSON: *Tropical Diseases.*) So far as our information goes the Andamans *were* visited twice, first in November 1864, and again in November 1865, but on both occasions the disease was confined to the batches of the convicts who brought it, and was stamped out by the energetic measures adopted. The disease was thus prevented from spreading to the other convicts and to the aborigines.

of these evacuations. These symptoms are numerous, and may not all be present in every case. The following are the most important and are pretty nearly in the order of their development,—extreme prostration, sunken eyes and pinched countenance, huskiness of voice, cramps or tonic spasms, skin cold and covered with clammy perspiration, extremely feeble and thready pulse or its disappearance at the wrist or even at the arm, thirst, restlessness, diminution and final suppression of urine, coma, collapse with hurried respiration and final extinction of life.

The Physical, Chemical, and Microscopic Characters of the Evacuations.

The first discharges are seldom seen by the physician, and are hardly noticed with care even by the patient. In the case of discharges from the bowels they are fæcal, and in the case of discharges from the stomach they consist chiefly of the food that had been taken, partly or wholly undigested. In both cases they are mixed with bile. It is when they become tempestuous that they lose their bilious character and become perfectly abilious, and free from the natural contents of the bowels and of the stomach. They are watery, having the color of rice-water or water in which rice has been boiled, sometimes of water in which boiled rice has been soaked for a couple of days or so, in which case they are whitish with a faint tinge of blue. They contain whitish flakes or shreds and granular matter which subsides into a whitish mealy sediment. Very rarely they may be pinkish or even reddish in color from admixture of blood.

The discharges are alkaline or neutral in reaction. They contain only a very small amount of albumen, showing that they do not represent the serum but only the watery portion of the blood. They contain a notable amount of urea, the discharge from the stomach containing more of this salt than the alvine discharge. The flakes or flocculi are the shreds and patches of actual mucous membrane, and the granular sediment is formed by the *débris* of this membrane and of its epithelial lining, mixed with white corpuscles and bacteria. Formerly the white granular deposit was looked upon as consisting of leucocytes, but now its

true nature has been discovered. The total amount of solids in the discharges does not exceed 2 per cent, and consists chiefly of "crystals of the triple phosphate of ammonium and magnesium and chloride of sodium in greatest abundance, but the proportion of ammonium and potassium salts is small."

Varieties of the Disease.

The Varieties of the disease are constituted by the preponderance of some particular symptom. Thus, with purging as a predominant symptom, we have *cholera diarrhœaica;* with vomiting, *cholera gastrica;* with both purging and vomiting, *cholera gastro-enterica;* with cramps, *cholera spasmodica.* Authors also make other varieties, as—*Cholera sicca,* when purging and vomiting are altogether absent, but there is a sudden prostration of the vital energies, indicated by coldness and lividity of the whole surface, failure of the pulse, and huskiness of voice, added to which there is suppression of the urine. *Cholera acuta,* in which the patient feels as if he were stunned, or has a sensation of weight in the head, or vertigo; oppression of the chest; numbness of the arms and legs. Afterwards there are rumblings in the intestines; heat of the body, rapid and feeble pulse; nausea, retching, or vomiting; bilious or watery diarrhœa; suppression of urine, &c. *Cholera inflammatoria,* in which, in addition to the fulness and frequency of the pulse, there are great heat of the body, redness of the eyes, &c. The last two varieties do not seem to be of much importance; and it is questionable if the very last is really a variety of true cholera.

Etiology.

In the treatment of all diseases, a knowledge of their cause is of the utmost importance, both with a view to their prevention and their cure. This is specially the case with cholera which overwhelms the powers of life with such violence and rapidity, and which has the faculty of encompassing, under favorable conditions, the whole world in its destructive embrace.

If we attentively watch cases of cholera we cannot fail to notice that whatever the cause, it acts primarily upon the alimentary canal. The power of absorption of the mucous membrane lining the canal is held in abeyance, either totally abolished or reduced almost to nil. The epithelium is shed not to be

fruits such as the jack, various kinds of gourds and melons, some kinds of cereals and pulses, which taken in excess or in an ill cooked condition can give rise to upward and downward evacuations and other symptoms simulating those of cholera. May not the disease thus originate? But even if it does, its communicability from person to person, from place to place near and far, cannot be thus accounted for. A few cases may be traced to over-indulgence in food otherwise salutary, or to incautious use of unsalutary food, but the vast majority of cases cannot be so traced.

Thus while the study of single cases fails to give us any clue to the discovery of its cause, the fact of its communicability puts us on its track, by drawing attention to the modes of that communicability. This is one of many instances in which side vision is of more importance than direct vision in scientific research. It was by the happy use of this lateral vision that Faraday made the discovery of induced electricity and that Sir William Crookes discovered the principle of the radiometer and the remarkable properties of high vacuum tubes.

The study of the history of the epidemics of cholera has established the fact on a firm basis that except in its endemic area, cholera has never been found to occur *de novo*, but is always an *imported disease*.

The outbreak of the disease in a place where it is not endemic is always traceable either to a case or cases, or to the fomites of such case or cases, imported directly or indirectly from its endemic home; and then the spread of the disease in the locality has been traced to the contamination of the food or the drink, especially the latter, with the dejecta of patients already affected.

This discovery was made so early as 1854, by the late Dr. Snow, and how it was arrived at is thus given by Dr. Patrick Manson in his *Tropical Diseases*: "In August, 1854, cholera was epidemic in parts of London, notably in the neighbourhood of St. Anne's, Golden Square. A child at 40, Broad Street, after an illness of three or four days died of the disease on the 2nd of September. The discharges from the patient was thrown into a leaky cesspool which, as was subsequently discovered, drained into a well only three feet away. This well supplied the neighbourhood with drinking-water. On the night of the 31st August cholera broke out among those who used the water of this particular well, very

few escaping an attack. On the 2nd of September a lady died of cholera at Hampstead. Attention was called to this lady's case, as hitherto the disease had not been seen in that district. On inquiry it was found that she had been habitually supplied with drinking water from the Broad Street well referred to, as she had formerly resided in Broad Street and had a liking for the water from this particular well. She drank some of the water which had been procured on the 31st August, both on that day and again on the 1st of September. On the latter day she was seized with cholera. A niece, on a visit to this lady, also drank some of the same water; she too was attacked by cholera and died. A servant also drank the water; although she suffered to some extent, she recovered. So far as could be ascertained by careful inquiry, these people had no connection whatever with the cholera district except through the water fetched from this particular Broad Street well. Cholera, as mentioned above, was not epidemic at Hampstead at the time." As Dr. Manson truly observes, "The inference that the germ had been conveyed in the polluted water is difficult to avoid."

Dr. C. Macnamara, in his *Treatise on Asiatic Cholera* (1870), while relating the severe out-break of cholera at Meean Meer during the Panjab epidemic of 1861, has mentioned the circumstances of a case which occurred in another part of the country, but in which, he says, "the most positive evidence exists, as to the fact of fresh cholera dejecta having found their way into a vessel of drinking water, the mixture being exposed to the heat of the sun during the day. Early the following morning, a small quantity of this water was swallowed by nineteen persons (when partaken of, the liquid attracted no attention, either by its appearance, taste, or smell). They all remained perfectly well during the day; ate, drank, went to bed as usual. One of them, on waking next morning, was seized with cholera; the remainder of the party passed through the second day perfectly well, but two more of them were attacked with cholera the next morning; all the others, continued in good health till sunrise of the third day, when two more cases of cholera occurred. This was the last of the disease, the other fourteen men escaped absolutely free from diarrhœa, cholera, or the slightest malaise." "These details

leave us no reason to doubt, that water, contaminated by the fresh dejecta of a patient suffering from cholera, produced the disease in five out of nineteen people who swallowed it, and that independently of either the season, nature of the soil, or any other appreciable circumstances, all of which were remarkably in favor of the persons attacked by the disease. Nor was cholera present in the place." This case would furnish direct evidence of the causal relation of the cholera dejecta to the disease, were the "details" fuller, but unfortunately the author has omitted to mention how the dejecta came to contaminate the drinking matter, how the patient, whose dejecta produced such disastrous consequences, came to be attacked with the disease which, it is asserted, was not prevalent in the place.

Some years ago, about thirty, the writer had to pay professional visits to a family residing in the northern part of Calcutta, which had already lost some members from cholera, and still had others suffering from the disease. The instance of so many cases of cholera occurring in a single house one after another led him to make careful inquiries about the sanitary condition of the house. A well was discovered closely adjoining the privy having no brick built platform around it. It was here that the soiled clothes of the patients were being washed, and with the water of this well the members of the house were washing their mouths and bodies. The dejecta of the first cholera patient must have in the first instance contaminated the water of the well by percolation through the porous soil, and thus the second case occurred. Subsequent contamination was easier and stronger, and the occurrence of subsequent cases was easily accounted for. No case occurred after the use of the well water was interdicted.

Leaving out the case of Dr. Macnamara as not reported with strict scientific accuracy, we have here given two out of innumerable instances in which the occurrence of cholera has been thus traced. They satisfactorily establish three facts, namely, 1. that the cholera dejecta, the discharges from the stomach and the bowels of cholera patients, contain something which may be carried with water, 2. that the water thus contaminated may percolate through porous soil, and contaminate sub-soil water, and 3. that this sub-soil water, if it gets access into the stomach, can give rise to cholera.

It may be said that in the instances we have cited the water of the contaminated well was used only for washing purposes and not for drinking. True. But the water, that is taken into the mouth for rinsing it with, cannot be entirely ejected, a portion of it perforce being swallowed by the involuntary acts of deglutition that are constantly going on. Besides, a good quantity of the contaminating matter remains adherent to the mucous membrane of the mouth, some of which must go down the pharynx and œsophagus into the stomach. In the cholera season in Calcutta, when the river (Hughli) is contaminated with the cholera dejecta, we have seen cases of the disease occurring not at the usual hour after midnight, but in the morning, forenoon, or afternoon, in bathers in the river, a few hours after their bath. Now bathers are in the habit of washing their mouth preliminary to the bath, and it is easy to understand how the morbific matter in the contaminated water may thus find its entrance into the stomach and produce havoc there. We may say, therefore, with truth, with Drs. Macnamara and MacLeod (Quain's *Dictionary of Medicine*), that "the evidence in favor of the communicability of cholera by means of water or food contaminated with cholera-dejecta is overwhelming."

The importance of this fact in the prevention of the disease need hardly be pointed out. The sanitary precaution, that must be taken to avoid cholera, is clear and practicable. We have only to see that the cholera-dejecta are properly dealt with, so as not in any way to gain access into the stomach either with food or water that we use for drinking or even for washing purposes. Can the morbific matter enter the system through the lungs or other channels? We do not think. It is true that the dry matter in the fomites of cholera patients conveyed through the air has given rise to the disease. But this is explicable by the fact of its coming in contact with the mucous membrane of the mouth and pharynx before entering the lungs, and therefore has better chance of being swallowed and affecting the stomach rather than the respiratory organs.

We have advanced then so far in the etiology of cholera that the fact has been established, that the evacuations of patients suffering from it furnish the most potent toxic material capable of

giving rise to the disease when swallowed by healthy individuals. But this is not enough. We ought to know what is it in these dejecta which is pathogenic. We have seen that these dejecta consist of a fluid holding in suspension solid particles and masses; that the liquid is alkaline, and contains in solution a trifling quantity of albumen, urea, some phosphates, &c., and that the solids contain chiefly masses of the epithelial lining of the intestines, and the *debris* of the same epithelium, and bacteria. We do not think the chemistry of the albuminous liquid has been fully worked out so far as research has gone. No substance actually toxic or of the nature of a ferment or fermentiscible body has been discovered capable of causing such violent action upon the stomach and the intestines as we have in cholera. Pouchet is said to have extracted toxins from the actual cholera stools. But what they were is not known, and no other experimenter has verified his results. Attention has therefore been directed to the solids in these dejecta, and more specially to the bacteria that abound in them. And this leads us to a consideration of the

Bacteriology of Cholera.

Bacteriology may be said to date as far back as when Leewenhoek, upwards of two hundred years ago, detected with his rude microscope minute living organisms in the saliva and putrid water. The foundation of the bacteriology, or germ-theory, of disease was laid when, after the discovery by Fuchs in 1848 of bacteria in animals dead of septicæmia, and by Rayer and others in 1850 of bacteria in animals that had died of anthrax, Davaine succeeded in inducing the latter disease in healthy animals by inoculation with a small quantity of the suspected organism. Ever since pathologists are on the look-out for the discovery of specific micro-organisms as the cause of disease, and the etiology of disease, especially of contagious and infectious diseases, has been receiving mighty developments.

But in order that the causal relationship of a certain micro-organism with a certain disease may be established with certainty, certain conditions must be fulfilled which, having been first formulated by Dr. Robert Koch, of Berlin, are known as Koch's postulates. These are—(1) That the organism must be demonstrated in the circulation, or tissues fluid or solid,

or both, of the diseased animal; (2) the organism so demonstrated, must be capable of artificial cultivations in suitable media outside the body of the animal, and successive generations of *pure cultivation* obtained; (3) such pure cultivation must, when introduced into the body of a healthy and susceptible animal, produce the given disease; (4) the organism must again be found in the circulation or tissues of the inoculated animal.

It is by the application of these tests that pathogenic micro-organisms are being distinguished from non-pathogenic ones, and the specific micro-organisms or germs of infectious diseases are being discovered. It requires considerable practical acquaintance with bacteriology to recognize the difficulty of applying these tests. There are so many fallacies which may attend these investigations, that it is absolutely necessary to exercise the greatest caution in order to avoid them, and to raise the probability into the certainty of a particular organism being the cause of a particular disease.

Dr. R. Koch, the highest authority on bacteriology, a year after his discovery of the tubercle bacillus in 1882, made the discovery, while in Egypt, of what from its shape he called the comma bacillus of cholera. In the following year (1884) he came to India on a special mission, and in Calcutta confirmed his discovery of this bacillus. He found it in all the cases of the disease that he examined, in the contents of the intestines of forty-two fatal cases and in the stools of thirty other patients. He could not find it in other diseases, nor in the discharges of healthy men. From its constant and invariable association with cholera he looked upon it as the cause of the disease; but he failed to demonstrate its causal relation by applying the test of his own postulates to the lower animals. In none of those experimented on was true cholera or anything like it developed, except in the case of guinea-pigs by most round-about methods not free from fallacy. Thus believing that it was the acid gastric juice that kills the bacillus, he neutralized it by sodium carbonate, but even this did not succeed, and he had to paralyse the muscular fibres of the intestines by the intra-peritoneal injection of tincture of opium before anything like the symptoms of cholera could be developed! Under these circums-

tances it cannot be asserted that the symptoms developed were by these comma bacilli alone, especially as similar results were obtained with other bacilli aided by such violent procedure as intra-peritoneal injection of opium.

It is true that cases of occurrence of the disease in man from accidental infection have been reported. A student of Dr. Koch, while attending his course on cholera, in 1884, got a severe attack from this cause. Metchnikoff has reported a similar case. Dr. Oergel, of Hamburg, is said to have died of the disease after having accidentally infected himself while injecting a guinea-pig. These are solitary instances, and against them there are others which lead to the opposite conclusion. Thus it is well known that Klein and others have several times, for purposes of experiment, swallowed good quantities of cultures of the pure bacilli; "yet, although in a few instances diarrhœa with comma bacilli in the stools has resulted, in perhaps no instance has true cholera, much less fatal cholera, been produced." These cases, we must say, however, neither prove nor disprove the causal relation of the bacilli to the disease.

The most fatal objection to Koch's view is offered by the facts that "the comma bacillus has been observed in the stools of individuals who did not at the time or afterwards suffer from cholera"; and that "a few cases of what from a clinical point of view appears to be true cholera have been observed in which the most careful and most prolonged bacteriological examinations failed to detect the comma bacillus." Against the first fact it has been advanced that there are auxilliary conditions besides the prime condition of the presence of the comma bacillus, which are necessary for the development of the disease, and that these were wanting in the cases under consideration. Against the second has been said that the examinations were defective which, considering the observers concerned, is a very lame and uncharitable assertion and proves, if it proves anything, that in some cases bacteriological diagnosis may be extremely difficult and not to be relied on, as was well illustrated in the Hamburg epidemic in 1892.

The variability of the cholera bacillus, admitted even by experts as will be seen from the following quotation from M. Hallkine, is a very strong argument against Koch's view :—

Variability of the Cholera Microbe.—When the cholera bacillus was first discovered, eleven years ago, its properties were described with great precision, which helped in concentrating for a long time all studies on well-defined and carefully-chosen specimens. Little by little, as the field of investigation grew larger, a number of varieties have been found with characteristics differing so largely as to annihilate almost completely the original description. When we open the intestines of deceased cholera patients and investigate the microbes there, the adopted methods will bring to the surface vibrios in which the external form, instead of the characteristic comma or spirillum, will vary between a coccus and a straight thread; the number and disposition of the cilia, the secretion of acids, the form of growth in broth, will vary; instead of giving in gelatine a discrete and well-defined figure of liquefaction, variation will extend from the complete loss of this property to a rapid dissolution of the whole of the medium; there will be varieties which grow luxuriantly in given media, and others which do not grow there at all; some will be phosphorescent in the dark, and others not; some will give the indol reaction, and others will be deprived of this property, and so on. The first thing to be done is carefully to select amongst these the most typical specimens, rejecting the others, and then we try their pathogenic power. We shall find such a divergence in strength that the extreme forms will not be believed to be of the cholera species. There will be commas deprived of any virulence demonstrable on animals, and others which kill the most resistent species. Some will be fatal to a guinea-pig at a dose of 1-100 of a culture tube, and others harmless in doses 500 times stronger. The average comma dies out when introduced under the skin of an adult animal; others will spread in the system and give a fatal septicæmia. The ordinary comma will be without effect on birds; but several specimens have been isolated, and believed to be typical, which easily killed pigeons by hypodermic or intramuscular injection. I believe to be of great value the method worked out by Pfeiffer for comparing all such varieties with one selected as typical, and which he employed for the preparation of an antitoxic serum. This method will be found of efficient help in distinguishing specimens of the greatest affinity with the average cholera comma. But once such specimens are selected and their particular properties studied, they begin to change from the first day they are introduced into the laboratory, and no calculation based on these studies is possible. In a case quoted by M. Metchnikoff, the proportion of initial power of the microbe, and the strength it showed at a later trial, was of 75 to 1, the microbe having gradually sunk to 1-75th of its initial virulence.

"These remarks," Dr. Manson has justly observed, "by so great a master of the subject, while they indicate a way of recon-

ciling many apparent discrepancies in matters of fact and differences in the conclusions arrived by different bacteriologists, and whilst they indicate a key to many of the clinical features of cholera, teach us caution in accepting as proved the causal relationship of the cholera vibrio to the disease with which it is so invariably associated." We shall return to a further consideration of the subject later on.

But before proceeding further it would be well to notice the original description of the typical cholera bacillus, the variability of which, as we have seen above, has been admitted by M. Haffkine. These bacilli are curved rod-like organisms, and when we have a name, vibrio, for the curved bacillus, why should Koch have called it comma bacillus is more than we can imagine, unless it be to give it a distinctive name to denote its specificity. These comma bacilli then are vibrios or curved rods, about half the length and twice the thickness of tubercle bacilli, that is, from 0·8 to 2μ in length and about 0·3 to 0·4μ in breadth, where μ is the symbol for one micro-millimetre, or one-thousandth of a millimetre, equal to about one twenty-five thousandth of an inch. In fresh cholera stools they are generally found isolated, sometimes united two to two in opposite directions forming an S-shaped figure. In stools that have been kept for a day or two, they are found several uniting to form spirilli or screw-like bodies, like those of relapsing fever, or sometimes they may form long spirilliform threads. They may be demonstrated by Löffler's method to have a terminal flagellum at one end, or rarely flagelli at both ends, on account of which they have a spinning motion in the living state. These flagelli are extremely slender, which renders them difficult of demonstration. They vary in length from one to five times the body of the bacillus. They are not always present.

These comma bacilli are aërobic but may become facultative anaërobic organisms. They liquefy gelatine, and do not grow above 42° nor below 14° C, the upper thermal death-point being 55° according to Kitasato, the lower thermal death-point has not been ascertained, a temperature lower than 14° simply arrests the growth of the bacilli, but does not kill them. According to the researches of Kansansky (1895) the cholera spirillum is

not destroyed by such a low temperature as —30° C, and that it even resists repeated freezing and thawing—three or four times (Sternberg). Unlike spore-bearing bacilli the comma bacilli are destroyed by dessication, but curiously enough they retain their vitality longer when dried on *silk* threads. At no time have they been observed to form spores. Hueppe's assertion that arthrospores are formed at the ends has been negatived by experiment. The best media for artificial cultivation are nutrient gelatine, potato, meat-broth, milk, blood-serum. The first two are the most convenient for purposes of diagnosis. The bacilli will grow even in sterilised distilled water; but they die within about 24 hours, the addition of a small quantity of sodium chloride, however, greatly increases their longevity. In unsterilized potable water their survival is influenced by the presence of salt and of other bacteria, the latter proving generally destructive of their life. In unsterilized sewage water they may live so long as 2 to 4 weeks. In ordinary moist soil they have been found to live from 4 to 8 weeks. In dry soil and in peat they die out in a few days. In cultures their vitality persists for many weeks.

The following summary by Sternberg (*Text Book of Bacteriology*, 1896) gives a good account of the conditions of growth of the comma bacillus of cholera: "In general this spirillum grows in any liquid containing a small quantity of organic pabulum and having a slightly alkaline reaction. An acid reaction of the culture medium prevents its development, as a rule, but it has the power of gradually accommodating itself to the presence of vegetable acids, and grows upon potatoes—in the incubator only—which have a slightly acid reaction. Abundant development occurs in bouillon which has been diluted with eight or ten parts of water, and the experiments of Wolffhügel and Riedel show that it also multiplies to some extent in sterilized river or well water, and that it preserves its vitality in such water for several months. But in milk or water which contains other bacteria it dies out in a few days. Gruber and Schottelius have shown, however, that in bouillon, which is greatly diluted the cholera spirillum may take the precedence of the common saprophytic bacteria, and that they form upon the surface the characteristic wrinkled film.

Koch found in his early investigations that rapid multiplication may occur upon the surface of moist linen, and also demonstrated the presence of this spirillum in the foul water of a tank in India which was used by the natives for drinking purposes." According to Karlinsky (1895) the cholera vibrio retained its vitality for from twelve to two hundred and seventeen days in woollen and linen goods, cotton batting and wool which were soaked in cholera discharges and preserved from drying by being wrapped in waxed paper.

A characteristic of the cholera comma bacilli has been discovered by Bujwid and Dunham which has been considered by them as diagnostic. It is the production of a pink or reddish-violet coloration in gelatine or bouillon-peptone cultures on the addition of pure sulphuric acid. This is known as the cholera-red reaction. Salkowski has shown, "the red color is due to the well-known indol reaction which in cultures of the cholera spirillum is exceptionally rapid and intense in its development." This characteristic distinguishes the cholera bacilli from the ordinary bacteria of the intestines and from the Prior-Finkler spirillum, but not from the vibrio Metchnikovi.

Like other pathogenic bacteria the comma bacilli of Koch produce toxins in the culture media, as a result of their metabolism. Brieger has found in pure cultures some well known toxic ptomaines such as cadaverin, putrescin, cholin, methyl-guanidin. But besides these he has obtained two others, which seem to be the peculiar products of these bacilli; one of which, a diamin resembling trimethyl-enediamin, inoculated into animals, gives rise to cramps and muscular tremor; the other reduces the heart's action and lowers the temperature, that is symptoms of collapse, and diarrhœa. A distinction has been made between the *intracellular* poison of a microbe generated within itself, and the *extracellular* poisonous substance or toxin produced outside the microbe, i.e., in the culture-media, as a result of its metabolism or vital activity. The former may be found in pathogenic as well as in non-pathogenic bacteria, the latter only in cultures of pathogenic bacteria, and it is not all pathogenic organisms which have poisons in their cell contents. The comma bacilli, the bacilli of typhoid fever, and several non-pathogenic bacilli, as the bacillus prodigiosus, vibrio of

Finkler, bacillus subtilis, have been proved to have intracellular poison, whereas the sporeless anthrax bacilli, the bacilli of fowl cholera, and the bacilli of diphtheria, all pathogenic bacilli, have been shown to be devoid of it.

It is not alone the variability of the so-called cholera microbe, annihilating, in the language of M. Haffkine himself, "almost completely the original description," that has cast doubt on its causal relationship to the disease. The discovery of the existence of similar microbes in other sources, as in the saliva, stale cheese, stools of cholera nostras, river water, &c., has made that doubt stronger. Thus Dr. Klein tells us: "Soon after Koch's discovery Deneke isolated from stale cheese a spirillum—*spirillum tyrogenum*, which in morphological and cultural respects bore a very great resemblance to Koch's cholera vibrio, in fact, looked at in the light of the present knowledge of different varieties of cholera vibrio, cannot be distinguished from this latter. In size, shape, motility, growth in peptone salt, and cholera red re-action in gelatine, on Agar, on blood serum, in its action on the guinea-pig (administered *per os* after Koch), it is difficult to distinguish it from the cholera vibrio; perhaps it grows a little faster on gelatine in the plate and in the stab, but, as has been stated on a former page, such differences are also observed between the individual varieties of the cholera vibrio."

As regards the comma bacilli or vibrios found by Neisser, Heider, Dunbar, and Sanarelli in the waters of the rivers of Germany and France, Dr. Klein says: "With the exception of the vibrio phosphorescens of Elwers and Dunbar, most of the others differ from the typical vibrio of Koch so little and in so few details—in fact, less so than do the individual varieties of vibrios isolated from noted cases of cholera—that from their morphological and cultural characters, including the cholera red re-action which they all show to a greater or less degree, and from their intra-peritoneal action on the guinea-pig, they cannot be distinguished from the different varieties of the cholera vibrios." The resemblance is so great, indeed, that Sanarelli has contended that these water vibrios are genetically related to the cholera vibrios,

all the rivers, from which they were derived, having been at some time or other contaminated with cholera dejecta. Even phosphorescence has been shown to be an unreliable test by Rumpel who has reported "that two undoubted cultures of the cholera spirillum, from different sources, having been passed through pigeons and cultivated in artificial media, showed phosphorescence."

Another comma bacillus, that discovered by Finkler and Prior, in 1884, in the decomposing stools of cases of sporadic or English cholera, and wrongly supposed by them pathogenic of the disease, has considerable resemblance to Koch's bacillus, in that it assumes the forms of S and spirilla, is aërobic and facultative anaërobic, liquefies gelatine, and that its cultures act on the guinea-pig exactly as the cholera bacillus. But the distinguishing characters are that it is distinctly larger, being longer and thicker, grows incomparably faster in gelatine at 20° C, and liquefies this incomparably quicker, the liquefied gelatine emitting a putrid smell, like that of a growth of proteus vulgaris, which is not the case with the cholera vibrio. Hence the bacillus or vibrio of Prior-Finkler is looked upon simply as a putrefactive organism.

Gamaleia in 1888 obtained, from the intestinal contents of chicken dying of an infectious disease similar to fowl cholera, prevalent in the summer season in certain parts of Russia, a bacillus resembling Koch's comma bacillus in having a curved shape, but thicker, shorter, more decidedly curved, and having a flagellum at one end. Gamaleia has called this bacillus, in honor of Metchnikoff, *vibrio Metchnikovi*. In peptonised bouillon cultures a red color is produced on the addition of pure sulphuric or hydrochloric acid, a reaction which is similar to, and perhaps even more pronounced than, that produced in similar cultures of Koch's bacillus. Unlike Koch's bacillus, the bacillus Metchnikovi is found not only in the intestines and intestinal contents but also in the blood. Gamaleia believes, "that the vibrio Metchnikovi and the cholera vibrio are mutually protective for the pigeon ; that is to say, that a pigeon that has survived disease caused by the injection of a non-fatal dose of one vibrio is protected against a subsequent injection of a fatal dose of the other." Pfeiffer and Klein have established

the fact that while the vibrio Metchnikovi is exceedingly virulent for the pigeon the cholera vibrio is not, which last is known to be very virulent for the guinea-pig. Thus the two vibrios are differentiated.

Pfeiffer has discovered a very sensitive test of the cholera bacillus which, he believes, is a sure and almost an infallible one. This is the germicidal action of the "cholera serum" on the cholera bacillus. That is, the blood-serum of an animal highly immunised by repeated intra-peritoneal injections of living cholera vibrios, when mixed in due proportion with what is known as a fatal dose of cholera vibrios, kills these vibrios, as is evidenced by the fact that such a mixture injected into the peritoneum of another animal has no effect on it. This was shown directly by the researches of Bordet which proved "that also in *vitro* cholera serum shows a definite separating action, in as much as when added in definite proportion to a suspension of living cholera vibrios contained in a test-tube, it makes the vibrios become matted together in clumps, settling at the bottom of the test-tube while the suspending fluid becomes clear, and that after some time the motility of the vibrios becomes impaired and ceases."

Pfeiffer says that this germicidal action of cholera serum is exerted only on cholera bacilli and not on others though morphologically similar, such as the comma bacilli of river water, &c. The researches of Dunbar, however, have shown that this test is not so reliable as it is believed to be. Comma bacilli derived from undoubted cases of cholera, as from the epidemic in Massowah, have been found not to respond to this test. Dr. Klein has found "that of guinea-pigs immunised by repeated intra-peritoneal injections with one variety of living cholera vibrios, derived from an undoubted typical case of Asiatic cholera of one locality in England in 1893, a certain percentage *did not* prove themselves resistant to the peritoneal injection with a fatal dose of cholera vibrios derived from an undoubted and typical fatal case of Asiatic cholera that occurred in another locality in England in 1893."

Dr. Klein has therefore felt justified in declaring that "all these results seem to me to show that the apodictic announcement that such and such a vibrio is not a cholera vibrio because

it does not succumb to the 'cholera serum' obtained by immunisation with a particular cholera vibrio is not sufficiently established, although it may be conceded that a vibrio which does answer in positive fashion to Pfeiffer's test is a cholera vibrio." We for our part do not see much value in a test which is so difficult of application, and which from the existence of so many exceptions is liable to so much misinterpretation. Fancy Pfeiffer declaring the vibrio of the Massowah cholera epidemic to be not cholera vibrio at all! Are we to infer from this that this epidemic was not one of cholera?

There are two note-worthy facts in connection with Koch's comma bacilli which must be taken into consideration in order that we may arrive at a conclusion as to their causal relation to cholera. These are: 1. That they are found, it is true, in the intestines of cholera patients, but not always to the exclusion of other bacteria. In some typical cases they occur almost alone, but in other typical cases they are found mixed up with other bacteria, sometimes with a considerable number of these latter. This association with other bacteria occur not only in the alvine discharges and in the intestinal contents, but also in sections of the hardened mucous membrane of the ileum and in the mouths and cavities of Lieberkühn's follicles. 2. That there is no definite relation between the number of these bacilli and the severity of the disease. The number may be small in very severe cases, and large in mild cases.

The most prominent facts about the comma bacillus, which we have placed before our readers may be summed up as follows: 1. These organisms are very frequently, though not invariably associated with cholera, being found in the cholera dejecta, especially those from the bowels, and in the actual contents of the intestines, especially of the lower parts of the ileum and colon, but found also in the jejunum and the stomach. 2. They have been found by Cunningham in health, that is, in the stools of persons who never at the time nor anytime afterwards suffered from the disease. 3. They were not found by Cunningham, in Calcutta, and Roy, Brown, and Sherrington, in Spain, in several typical cases of cholera. Lesage and Macaigne could not find them in 45 out of 198 cases they had examined. In these 45 cases the bacterium

commune coli were found alone in 15; associated with staphylococci, streptococci, or rarely the bacillus pyocyaneus in 30. 4. The variability of the bacillus is so great, as, in the opinion of one ardent follower of Koch, to almost completely annihilate his original description. 5. Other comma bacilli have been discovered in so many different sources, such as the ordinary saliva, old cheese, cholera nostras, fowl enteritis, &c., and their resemblances to the cholera comma so great and the differences between them so slight that for practical purposes their differentiation becomes exceedingly difficult, especially as there is so much variability in the cholera bacilli themselves. 6. There is no definite relation between the number of the comma bacilli and the severity of the disease they are supposed to produce. 7. They are often associated with other bacteria.

What is the inference that may be legitimately drawn from these facts? Strange as it may seem, this will depend upon the view we take of cholera itself. Are we to look upon cholera as one and the same disease in every case? There are undoubtedly variations in the symptoms in different cases to justify their classification into varieties. Are all these variations accidental, depending upon differences in the constitutions and environments of the patients, or are some of them specific depending upon differences in the causes which produce them? We are inclined to believe that while some variations are accidental, there are others which are specific, depending for their origin upon different causes. This is countenanced by the analogy of the pathogenetic actions of drugs on the human organism. We have a number of drugs which act on the alimentary canal producing symptoms similar in a general way to those of cholera, but each has its specific action so as to differ from those of the others, thus analogizing with the specific varieties of the disease. We are aware that even the same drug may produce symptoms which may in some respects be different in different persons, but notwithstanding these differences, there are some constant symptoms which give the impress of specificity upon its action as different from those of others, and here we have the analogy with variations in the symptoms of cholera from the same circumstances.

Viewed in the light of the analogy of drug action the facts that

have been disclosed about the comma bacillus of Koch lead to a conclusion which we believe is not far from the truth. It is this, that though it is not responsible for all cases of cholera, it is pathogenic of a large majority of them ; it is not the only specific cause of the disease, but it is one of the most important of all the causes, especially when it prevails as an epidemic or pandemic. In undoubted cases where its presence could not be detected by competent observers, we must admit that other causes must have been in operation. These other causes might be some species of bacteria different from the comma, or some organic ferments or toxins developed as a result of bacterial action, or even some inorganic poison. In support of this view we may mention the fact that poisonings with ptomaines, with arsenic, antimony, corrosive sublimate, &c., have often been mistaken even by experts for cases of cholera.

If what we have advanced regarding cholera and its causation be true then many facts which were obscure become clear and their significance is easily understood. If cholera is a disease which, in its essential characters, may be produced by a variety of causes, then the variations presented by it in different epidemics and in different cases even in the same epidemic are no longer vagaries of the disease, but clearly traceable to real and intelligible causes, and the discrepancies in the bacteriology of the disease are no longer puzzling and need not give rise to hot controversy. Indeed, from the point of view we have endeavoured to set forth, the bacteriological investigation of the disease has not only not been in vain, but has acquired great importance in suggesting measures for its prevention.

Admitting as we have done that the comma bacillus of Koch is one of the principal causes of cholera, the question has yet to be settled, in what way does it produce the disease ? This is the question which has to be answered for all diseases of bacterial origin. We have seen that as a general rule all bacteria secrete poisons in the culture medium, or rather the culture media become charged with substances as a result of their vital activity or metabolism, substances which are more or less poisonous. We have seen that some bacteria, not necessarily pathogenic, are poisonous in themselves, having poisons in their protoplasm, that is, within the bacterial cell. This also must be a result of

their vital activity, for they draw their nourishment from the culture medium, which itself is harmless or non-poisonous. And therefore it must be that part of this pabulum must be converted by the anabolic or katabolic process into a toxic substance. Now the fact that all pathogenic bacteria have not intracellular poison, shows that the production of disease by those that have not the intracellular poison, must be due to the toxins or poisons they produce in the medium in which they live, and not by their poisonous properties, as they have none. What of the pathogenic bacteria, such as the comma bacillus, which produce both intra- and extra-cellular poisons?

There is this fact in connection with the comma bacillus, namely, that it is found only in the intestines, rarely in the stomach, and never in the tissues, organs, and blood. Hence the disease must be due either to the poisons or toxins generated in the intestinal contents, or to the poisons in the microbes themselves, or to both these combined. If it is due to the microbes themselves then they must act as local irritants of the mucous membrane of the intestines. If it is due to the toxins then there may be either local irritation by their local action or general intoxication by their absorption into the system, or by both kinds of action. It is not easy to determine which. Koch maintains that the disease is an intoxication due to the absorption into the blood of the extracellular poison elaborated by the bacilli within the intestine. The fact that the primary lesion in cholera is confined to the alimentary canal, the other lesions being only its secondary consequences, lends probability to the surmise that the whole action is local. In other words, however violent and rapid its symptoms, cholera is a local and not a septicæmic disease.

The results of the hypodermic injection of the comma bacilli are helpful to some extent in the determination of this question. These results are severe local irritation in the shape of œdema, and even necrosis and ulceration at the seat of the injection, and a smart febrile movement. The former shows that the bacillus and its toxin must be violent irritants, and the latter that the toxin is readily absorbed and produces a toxæmia in the shape of severe fever. Now as fever is a later and not a constant sequela of cholera, when the bacilli have ceased to exist in the intestines, we may legitimately infer that the choleraic process

set up by the bacilli is originally and primarily one of peculiar irritation of the mucous membrane of the intestines and their ganglionic governing nerves. The discovery by Brieger of two toxins as peculiar to the comma bacillus, one of which produces cramps and muscular tremors, the other lowers the action of the heart and the temperature, and produces diarrhœa, if confirmed, would seem to negative part of the above inference and to point to a general toxæmia. But the discovery has not been confirmed, and the toxins are looked upon as artifacts or artificial products resulting from the methods adopted in isolating them and not as products elaborated by the microbes themselves.

According to Dr. Manson the fact of the febro-genetic action of the comma bacillus, "together with the rapid and intense prostration which, in some instances of natural cholera, appears to be out of all proportion to the amount of catharsis present, suggests that in a measure the lethal effects of the vibrio are attributable, not alone to the drain of fluid from the blood and tissues, but also to the absorption of a cholera toxin from the intestine." But he immediately corrects himself and remarks: "It is strange, however, if this toxin be anything more than a subsidiary element in the production of the symptoms in most instances of the naturally acquired disease, that catharsis is not one of the effects of the hypodermic introduction of the vibrio, and that fever is not an earlier and more prominent symptom in natural cholera." He arrives, we believe, at very nearly a correct conclusion when he says: "The modern tendency is to regard the clinical phenomena as the result partly of local irritation and partly of a toxæmia; variation in the proportional intensities of the various clinical elements depending on the degree of virulence of the particular strain of microbe introduced, and on the circumstances and idiosyncrasy of the patient."

A question of great importance here arises which should receive a definite answer. Are living bacteria necessary in all cases for the development of the choleraic process in the intestine, or the introduction of their toxins may do as well? Koch himself has said and others have supported him that the comma bacillus does not bear dessication, and this is borne out by the fact of their being non-spore-bearing. This fact, coupled with the fact that dry fomites of cholera patients often spread the

disease, leads to the inference that the toxins in the absence of their generating microbes may give rise to the disease unless we suppose that the so-called dry fomites were not absolutely dry but were moist enough to enable the microbes to retain their vitality. This is a far-fetched supposition, and we are inclined to believe that the toxins *can* set up the choleraic process. Whether the disease thus developed is more or less severe than when developed by the bacilli from the beginning, is a question which requires to be determined.

Having disposed of the comma bacillus of Koch as one of the most frequent causes of cholera, we have to see what other causes there are or may be. That there are other causes must be evident from the fact observed by expert bacteriologists that in cases of disease having all its clinical features, the comma bacillus could not be found, whereas other bacteria were found in abundance. Are we to say with Koch that these were not cases of cholera? This would be doing too much violence to clinical diagnosis which is the only most trustworthy and reliable. May not other bacteria under favorable circumstances produce the disease? We do not think this point has been investigated, with the attention and persistence that the comma bacillus has been, but it ought to be.

Though most infectious diseases are of bacterial origin, we do not believe that all are so. Some of them may be due to organic poisons otherwise manufactured than by bacteria. But whether due to bacteria or not, they must have had a beginning at some time or other, however remote the past may be. Now the question is, if they could have had such a beginning without infection from a previous case, could they not have such beginning in the present? Could they not arise *de novo?* We believe this is not only probable, but quite possible, and that under favorable conditions such diseases do arise without previous infection. This view is supported by the fact that in many instances of undoubted infectious diseases, the most searching investigation fails to trace the infecting cause. This is notoriously the case with cholera. The disease, in numbers of instances, cannot be traced to any other than the common cause of faulty food. In such cases the bacteria associated with it may acquire infective

virulence from their flourishing in a virulent medium, the evacuations produced by the disease. This is not a violent supposition, as the fact is well known that bacteria can lose or acquire virulence according to conditions under which they may be grown.

Morbid Anatomy and Pathology.

Morbid anatomy is a description of the alterations in the tissues and organs of the body brought on by disease. Pathology is morbid physiology, and is a description of the alterations in the functions of the altered tissues and organs. Morbid anatomy deals with facts as actually observed. Pathology has mostly to deal with inferences that are drawn from these facts, and must necessarily be to a certain extent speculative. Morbid anatomy deals with alterations that may be observed with the naked eye as well as those observed with the aid of the microscope. Though regular epidemics of cholera have been prevailing for over a century, the microscopic anatomy of the tissues and organs under the disease, with the exception of the mucous membrane of the intestines, has not been investigated with the care it deserves.

It should be remembered that our knowledge of morbid anatomy is derived from examination of the body after death. Hence post mortem changes are likely to be confounded with actual changes produced by disease during life. And, therefore, it is difficult to get at the true morbid anatomy of a disease unless the body is opened immediately after death which is not allowable for a variety of reasons, not the least of which is, that we cannot be sure of death until after the lapse of some time after its occurrence. The only corrective for this is repeated observation and a due attention to the possible action of physical and chemical laws on the constituents of the dead organism. With these preliminary observations we proceed to describe the morbid anatomy of cholera.

The morbid anatomy of cholera varies according as death has taken place in the stage of collapse, or after reaction had set in, and in the latter case according to the length of time the reaction had lasted. Though not mentioned in books, we think the morbid anatomy will vary also according to the treatment that had been employed. Powerful drugs are likely to leave their impress upon the tissues and organs. It is not

easy, however, to differentiate the lesions produced by drug-action from those produced by the disease.

1. *General Appearance of the Body.*—When death has taken place during collapse, the whole body will present a shrunken aspect, the eyes particularly are sunken deeply in their orbits, the temples are sunken and hollow, the nose is sharply pinched and bent, the skin tightly adherent to the bones and in consequence is very much deficient in mobility. The color of the skin is livid or leaden gray. The body resists decomposition for a much longer time than after death from other diseases. This is most probably due to the dessication of the tissues from drain of fluids from them.

2. *Temperature.*—Singularly enough even after death during collapse the temperature may rise much higher than what it was while the patient was alive. It has been seen to rise from 94° to 98° and even 100°. In one case that we saw long ago when the thermometer had not come into use, the heat of the surface appeared to be much higher than 100°. The rise of temperature may begin shortly before death and continue for some time after. "In one case," says Dr. C. Macnamara, "in which the body was kept in saw-dust its temperature was retained for no less than three days." But this was because the heat was prevented from radiating. We are inclined to suspect that the drugs administered during life have probably some influence in causing this post mortem rise of temperature.

3. *The Muscular System.*—The muscles, owing to wasting away of the soft parts from loss of water, stand out prominently through the skin. They are found to be very firm and dark in color. Some of them have been seen to be actually ruptured, indicating the violence of the cramps or spasms during life. The cadaveric rigidity or rigor mortis due to their contracted state presents a marked and persistent phenomenon. It sets in earlier than in other diseases. The contraction of the muscles may be so prominent and regularly progressive as to simulate living movements. These contractions may vary from slight twitchings or quiverings to marked clonic spasms. Their duration may be from a minute and a half to more than an hour. Barlow has related the following case of a patient who was a strong man and had suffered severely

from cramps: "Within two minutes of his ceasing to breathe muscular contractions began, becoming more and more numerous. The lower extremities were first affected. Not only were the sartorius, rectus, vastus, and other muscles thrown into violent spasmodic movements, but the limbs were rotated forcibly and the toes were frequently bent. The motions ceased and returned; they varied also: now one muscle moved, now many. Quite as remarkable were the movements of the arm: the deltoid and biceps muscles were peculiarly influenced; occasionally the forearm was flexed completely and when I straightened it, which I did several times, its position was recovered instantly. The fingers and thumbs were now and then contracted, and at times the thumbs moved separately. The fibres of the pectoral muscles were often in full action; distinct bundles of them were seen at intervals beneath the skin..... After I had taken leave of the body the nurse was horrified by a movement of the lower jaw, which was followed by others; and I thought for a moment that the man was alive. The facial muscles became generally affected, and at length all was still."

These muscular contractions sometimes give strange attitudes to the body. In one case the body was turned completely to one side. In another case movements began in one leg and the hand was drawn across the chest. In a third the forearms were so flexed and the hands so much approximated as to give to the body the attitude of prayer. In a fourth the eyes were seen to open and move in a downward direction. "These muscular phenomena after death," says Dr. Alfred Stillé from whom we have quoted the above facts, "form an interesting feature in the history of cholera, but they are by no means peculiar to that disease. They have been observed in other diseases, and especially in yellow fever—an affection in which the pathological condition is quite unlike that of cholera. In both diseases they have been manifested in robust persons and when the course of the fatal attack was both rapid and severe." Do not these phenomena show that the life at least of the spinal cord has not become extinct? And do they not give a solemn warning against hasty disposal of the dead, especially by cremation?

4. *The Alimentary System* bears the brunt of the disease, and here, therefore, lesions are expected to be most marked and are actually so found.

Even the upper portions of this system present changes which are worthy of notice. (*a*) "The epithelium of the *nasal passages and mouth*," says Dr. Macnamara, "will be found almost completely destroyed after death during the collapse of cholera, the cells having been disintegrated in the early stages of the disease ...leaving the basement membrane bare and denuded. We know that in cases of cholera the patients speedily lose all power of taste and smell, and this is easily accounted for by the fact of the epithelium being destroyed."

(*b*) *The Œsophagus*, according to Lebert, is cyanotic in the algide stage, and ecchymosed at a later period. Its isolated glands are sometimes markedly swollen. "I have found," says he, "the epithelium detached, and once the lower part was covered with fibrinous diphtheritic membranes." According to Dr. Macnamara, "the epithelium of the pharynx and œsophagus is shed in large patches, and near the orifice of the stomach is often entirely destroyed."

(c) The Stomach, in cases of death during collapse, is found distended and filled with an almost colorless fluid similar to the vomited matter, is alkaline in reaction, rich in albumen, full of altered epithelial cells and their débris, and sometimes even red blood globules which impart a rosy color to the fluid. If death takes place later the stomach is often empty, or filled with a yellowish-green, sticky, gelatinous, or mucous fluid. In collapse the mucous membrane is hyperæmic, but later patches of ecchymoses are observed, and sometimes it is found covered with thick tough mucus.

(*d*) *The Small Intestines* present the greatest and the most important changes. The peritoneum during collapse is dry, of a diffuse reddish hue, or of an injected appearance, and covered with a thin layer of sticky fluid. The cavities of the intestines contain, in the early stage, the characteristic rice-water, in rare cases a pale-red, fluid. The mucous membrane, if examined immediately after death during collapse, may be found unusually pale and even healthy, but generally congested after reaction had set in. According to Dr. Stillé, "The general paleness of the intestinal mucous membrane in the stage of collapse, and its congestive redness whenever the signs of reaction have existed before death, have a very important bearing upon the pathology of this disease, for they demonstrate conclusively that the gastro-intestinal evacua-

tions in cholera have no relation whatever to inflammation. On the other hand, they render it altogether probable that the serous flux is in the nature of a sweat, an intestinal ephidrosis."

The mucous membrane of the intestines will be found to have been denuded of epithelium in considerable tracts, the basement membrane being left bare, and thus in these parts to have lost its velvety appearance, or rather as Prof. Pacini has more happily said, it "looks like velvet which has lost its pile." The epithelial coating of the villi is found to be so completely detached in "masses of conical cells moulded to the shape of the villi," and "forming as it were," in the language of Dr. Macnamara, "the finger of the glove, after the hand has been withdrawn." Speaking of these epithelial masses Dr. Beale said, "in very many cases large flakes can be found, consisting of several uninjured epithelial sheaths of the villi." Dr. Beale had observed remarkable changes in the smaller vessels especially in the capillaries and small veins of the villi and submucous tissue. The blood corpuscles appeared to him to have in a great measure been destroyed in the smaller vessels, and in their place clots were seen containing blood-coloring matter, minute granules, and small masses of germinal matter evidently undergoing active multiplication. Some of the arteries were seen contracted and here and there containing small clots destitute of blood-corpuscles. There are ample reasons to show that this shedding of the epithelium of the mucous membrane of the intestines takes place during life, and is not a mere post mortem change. "It is," as Dr. Macnamara has well remarked, "the rapid death and destruction of the intestinal epithelium during life, which is the characteristic feature of the disease, and renders it so deadly."

(*e*) *The Large Intestine or Colon* presents nothing different from what is observed in the small intestines as regards both its epithelial covering and the condition of its vessels. In cases of death after reaction both the small and the large intestines may contain a greenish, instead of the characteristic rice-water fluid, and the large intestine may contain masses of half-solid fæces. "The anatomical characters of secondary colitis, of a diphtheritic, dysenteric nature, are seen comparatively often in some epidemics, while in others they are almost entirely absent" (Lebert).

(f) The Glands of the intestines, strangely enough, instead of being shrunken during collapse, are found to be more prominent and swollen. The Brunner's glands peculiar to the duodenum are, according to Lebert, the first to be attacked. "But the affection of the glands in the lower part of the small intestine is the most characteristic. Both the isolated and agminated glands (Peyer's patches) are markedly swollen and prominent. The isolated glands stand out in relief, their size varying from that of a millet-seed to that of a pea, while the patches of Peyer, which also stand out prominently, are granulated on the surface. The swelling is most pronounced towards the ileo-cæcal valve..... As a rule, however, the swelling rapidly diminishes at the end of the second day and in the course of the third.....In cases of early death in some epidemics, Peyer's patches, towards the end of the small intestine, have been found slightly ulcerated as in typhoid fever. The glands of the large intestine, in cases of early death, are also found swollen, prominent, lens-shaped, or with a reddish opening. They, too, collapse at a later period, and show the same retrograde changes as the glands of the small intestine."

(g) The Mesenteric Glands, especially those belonging to the duodenum, will be found congested.

(h) The Liver, in death during collapse, is pale and flaccid, weighs less than normal. Its lobular structure, indistinct from contraction, is of a lighter color than in the natural state; its capsule is wrinkled. All this indicates the almost total suspension of blood-supply through the portal veins which, however, are often found loaded with viscid blood. At all stages of the disease the *gall bladder* is usually found distended and full of dark viscid bile during collapse, and more watery and brighter green after reaction has commenced.

It is in the alimentary system that the comma bacillus is found, and even here it is confined to the stomach, the small and the large intestines. In the stomach these bacilli are very rare, and are most abundant in the lower part of the ileum. They are found chiefly on the surface of the mucous membrane. But they have been found between the epithelium and the basement membrane, within the tubular glands, in some instances even in the muscular layers of the intestine; and in a few cases

they have been traced as far as the liver and gall-bladder. They are not found in the intestinal contents after reaction had set in, especially when the stools had become fæcal, but could still be found in the tubular glands (Lieberkuhn's crypts). They cannot be found anywhere when death has taken place from some sequela of the disease.

(i) The Spleen generally presents nothing abnormal except that it is much lighter than natural, weighing not more than two and a half to three ounces in the adult, being about a third or half of its normal weight. Lebert says he has several times seen it enlarged in consequence of apoplectic effusions, and also in cases where cholera complicated a typhoid fever. In the latter case it is doubtful if the spleen was not enlarged before cholera. In malarious patients with enlarged spleens an attack of cholera has been found to *reduce* the size of the spleen considerably.

5. *The Respiratory System.*—Lebert's observation, that in *all* stages the *lungs* are deeply engorged with blood, especially in their inferior and posterior portions, is not borne out by the observations of others. It is true that according to one authority (Dr. Gull), "in the majority of cases fatal in the algide stage, no other morbid change existed than engorgement of the lower and posterior parts of the lungs," and "in some instances this was so complete as to cause portions of the pulmonary tissue to sink in water," yet "the anterior and superior parts were drier than natural." According to Drs. Sutton and C. Macnamara and our late Dr. Chuckerbutty the lungs in about half the cases were congested." But according to Dr. Parkes "the lungs are always more or less collapsed, shrunk and small, and lying back in the chest, toward the spine," and that far from being engorged or congested, they are (with the exception of a small portion of their posterior part rendered dense by hypostasis) singularly bloodless, dry, and tough. Dr. Sutton found, notwithstanding their congested condition, the weight of the two lungs in death from collapse to be only about twenty ounces, whereas after reaction about forty-five ounces; and he describes them as being dry on section, containing very little blood, which is principally collected in the pulmonary arteries.

Lebert says: "The mucous membrane of the *trachea* and *bronchi* is very much engorged with blood in cases of early death

and is covered, later when there is moderate hyperæmia, with mucus, with which masses of leucocytes are more or less mingled. In exceptional cases I found the *glands* of the trachea swollen." This requires confirmation by other observers.

6. *The Blood-circulatory System.*—Dr. Chuckerbutty found, in thirteen cases, the right cavities of the heart containing dark blood, fluid or clotted, and in five of these cases, the left cavities also contained similar blood, "therefore, in exactly one half of the cases, the right cavities were full of blood, and in about a quarter likewise the left cavities." According to Dr. Parkes in twenty-six out of thirty-nine cases, the right auricle and ventricle were flaccid, or distended with large fibrinous clots, or with dark semi-coagulated blood, while the left auricle was partially, and the left ventricle completely and firmly contracted, containing little or no blood, or only a small soft clot." The clots are either soft and dark, or firm and colorless. Lebert once found a thin fibrinous clot spread out in the form of a membrane over the whole surface of the right ventricle.....Sometimes the clot is continued into the terminal branches of the pulmonary artery and in cases of early death are found also in the larger veins and there is great distension of the smaller venous network." In some cases he could not find any blood in the heart at all, either in its left or right cavities.

The Pericardium presents the same appearance as the peritoneum and the pleura, containing but little or no fluid. Whenever there is any fluid it is very scanty, scarcely more than a mere moisture, and is sometimes found to be sticky. Later the secretion may be normal or increased in quantity. Patches of ecchymosis, of the size of a lentil, scattered or in groups, are according to Lebert, constantly found on the epicardium, but rarely on the parietal layer.

The Blood presents physical and chemical changes which might be expected from the transudation that has taken place from the walls of the capillaries of its watery portion and with it of the substances, organic and inorganic, albumen and salts, held in solution in it. The blood accordingly is found deficient in water, albumen and salts, thick and inspissated, and dark in color, like treacle or tar. From the exosmosis that takes place from the red corpuscles into the surrounding fluid, they are shrivelled and

shrunk and in a diffluent condition, and therefore ill-fitted to carry on their function of absorbing oxygen, which accounts for the dark color of the blood. An excess of leucocytes, first discovered by Virchow and confirmed by Lewis and Cunningham, has been observed both in the liquid and clotted blood, and in various stages of degeneration. The fibrin must be in an abnormal condition as is evidenced by the generally softish nature of the clots found in the heart and in the large vessels. It is said that urea has been detected in the blood in cases of death during collapse. Neither the microscope nor chemical analysis has succeeded in discovering anything of the character of an organism or of the nature of a poison or virus in the blood at any stage of the disease. This seems to be inconsistent with the fact brought to light by the researches of Klemperer, Botkin, and Wassermann "that the blood-serum of a person who had recovered from an attack of Asiatic cholera possesses the power to confer passive immunity to guinea-pigs against the action of the cholera vibrio."

7. *The Urinary System.*—According to some the kidneys present no marked changes when death has taken place early in the attack, and are of natural size. But according to Lebert, who devoted special attention to the lesions of these organs, even in cases in which death occurred in from sixteen to twenty-four hours after the attack, an increase of volume was observed, they being filled with blood in the form of stripes and punctated injections in both the cortical and medullary substances, and on the surface in more star-shaped and marbled spots, with numerous and thick anastomoses." It is certain that there is more blood on the venous side, the arteries being comparatively empty and the veins congested.

The Urinary Bladder, besides being empty and contracted, presents nothing particularly abnormal, unless we look upon the cyanotic condition of its mucous membrane as part of the general cyanosis of the whole surface, as such. Even when death takes place in five or six days after the attack, the bladder will be found to be quite empty, the suppression of the urinary secretion having been complete. Exceptionally even in collapse a small quantity of urine of an albuminous character may be found in it.

8. *The Nervous System.*—We take the following from Lebert in Ziemssen's *Cyclopædia of Practical Medicine*: "The nervous system shows few alterations, even in cases of late death with typhoid symptoms. In cases of death shortly after the attack the cranial bones and the membranes of the brain are engorged with blood, and a thick coagulum fills the sinuses. Once I found a fresh effusion of blood between the dura mater and the arachnoid. The cerebro-spinal fluid is entirely absent in cases where death occurs at an early period, or is present in only slight quantity, and of almost pasty consistency; but I have often seen it more copious where death has occurred at the end of thirty-six hours; and where death occurs still later, it may even exceed the normal amount in slight degree. The pia mater loses its marked hyperæmia in a more protracted course of the disease and becomes dry, and once I found it icteric. The fluid of the ventricles remains scanty even where death occurs at later periods. It was only exceptionally that I have seen it increased to two or three ounces (in weight); such an increase I once observed where death had occurred as early as at the end of thirty-six hours, though usually it is not increased until after three days and more. There was no connection between this increase and the typhoid state. Ecchymoses on the external surface of the brain (pia), or on the internal surface (ependyma), are not rare. Only once did I find small capillary effusions in the pons. Usually, where death occurs early, the brain is well supplied with blood; where death occurs later, it is less so, and sometimes it is even slightly œdematous on the surface." The statements of Dr. Thudichum, that "the cylinder axis separates, the nerve marrow curdles, in the algide stage," and "that many brain lesions are due, in this disease, to arrest of the circulation in its capillaries by altered blood and epithelial cells, forming plugs which effectually close the vessels," require confirmation.

Such are the lesions met with in cholera. Are there among them any which may be looked upon as the primary lesion, and the others as secondary ones? "In looking over the field that has been traversed," says Dr. Stillé, "and searching for some link that will unite in a consistent whole the causes, symptoms, and lesions of cholera, it is evident that only one factor can possibly be so described. That factor is the gastro-intestinal flux. This

it is that produces the vomiting and the purging; that prostrates the patient and wastes away in a few hours the fullest and the firmest form; that chills the limbs and afterwards the trunk; that thickens the blood so that the capillary vessels can no longer convey it, and that spreads a cyanotic shadow over the whole surface of the body; that cuts off the supply of blood from the lungs and heart; that paralyses the nervous system, ganglionic as well as cerebro-spinal; that obstructs the kidneys and arrests their secretion; and that, acting through the several links of this pathological chain, becomes the cause of death." This gastro-intestinal flux is due to the destruction and shedding of the epithelium of the gastro-intestinal mucous membrane. This lesion, therefore, must be regarded as the primary lesion of cholera.

Diagnosis.

If all the cases of the disease were equally severe, presenting the rapid development of the symptoms,—the tempestuous profuse colorless discharges, the collapse rapidly supervening indicated by a vanishing pulse, shrunken features, shrivelled fingers and toes, a cold clammy livid skin, cold breath, the most agonizing cramps, and suppression of urine,—the diagnosis would have presented no difficulties. Such cases occur generally at the height of an epidemic when the very prevalence of the disease affords a sure criterion for diagnosis. It is in sporadic cases, especially when mild, that the diagnosis becomes a matter of extreme difficulty.

It should be remembered that though the disease was prevalent in India long before 1817, the term cholera or rather cholera morbus was not applied to it till September of that year when a severe epidemic prevailed in Jessore and in Calcutta and its suburbs. This was done first by a magistrate of Calcutta and was confirmed by the Medical Board under the Government of India, to whom the letter of the magistrate was referred. Singularly enough the Medical Board did not speak of the epidemic at Jessore as one of cholera, but said "that the disease is the usual epidemic of this period of the year" and "that in certain quarters of Calcutta a similar epidemic prevails." It seems that it was only at the suggestion of the magistrate that they called the disease cholera morbus. Since then the Indian

disease has been known by this name, or simply as Cholera. Now, the reasons, which led the Medical Board to adopt this name for the Indian disease as they saw it prevailing, were chiefly no doubt the close resemblance between it and the disease which since Hippocrates has been so designated, and which has been so graphically described by Sydenham, but partly also their want of minute study of the two diseases so as to be able to distinguish between them.

We take the following from Sydenham's description in order to see the resemblances and the differences between the two diseases. According to him the cholera morbus as it prevailed in his time was "partial to a particular part of the year. It sets in at the end of the summer and the beginning of autumn, as truly as the swallow comes in spring, or the cuckoo sings in summer." "Its presence is easily understood. There is vomiting to a great degree; and there are also foul, difficult, and straining motions from the bowels. There is intense pain in the belly, there is wind, and there are distension, heat-burn, and thirst. The pulse is quick and frequent, at times small and unequal. The feeling of sickness is most distressing; and is accompanied with heat and disquiet. The perspiration sometimes amounts to absolute sweating. The legs and arms are cramped, and the extremities cold. To these symptoms, and to others of a like stamp, we may add faintness. The disease terrifies the lookers-on, and sometimes proves fatal within twenty four hours. Besides this, there is dry cholera characterised by flatus from above and below, but without either vomiting or purging." In his epistle to Dr. Brady, dated Feb. 7, 1679, he refers to the cramps as follows: "As the summer came to a close the cholera morbus raged epidemically, and being promoted by the unusual heat of the weather, it brought with it worst symptoms, in the way of cramps and spasms, than I had ever seen. Not only, as is generally the case, was the abdomen afflicted with horrible cramps, but the arms and legs, indeed the muscles in general were afflicted also; so much, that the patient would at times leap out of bed, and try to ease the pain by stretching his body in every direction."

Writing later Sydenham says the same thing about the disease, but more concisely: "This is limited to the month of

August, or to the first week or two of September.....Violent vomiting, accompanied by the dejection of depraved humors, difficulty in passing them, vehement pain, inflation and distension of the bowels, heart-burn, thirst, quick, frequent, small, and unequal pulse, heat and anxiety, nausea, sweat, cramps of the legs and arms, faintings, and coldness of the extremities, constitute the true cholera—and it kills within twenty-four hours."

It is not a little singular that there is no mention, in the above description, twice repeated, of the evacuations upwards or downwards being green or bilious, which, according to Sir Thomas Watson and others, are the characteristics of the cholera morbus which distinguish it from the Indian disease. The epithets *foul* in one description and *depraved* in another cannot be construed to mean bilious in any sense or form, yellow, or green, or dark-green so as to appear almost tarry and black. But the evacuations must have had some color, and the omission of its mention was singular on the part of such an acute and observant physician as Sydenham. Or did he think it enough to call the disease cholera, which meant bile-flux, and therefore thought it unnecessary to draw special attention to the bilious character of the evacuations? But what did he mean by "humors," and what did he mean by "depraved" as applied to them? Bile is one of the humors. Did he include it in the term? He evidently followed or corroborated Hippocrates in his description of "dry cholera," in which, according to the Father of Medicine, "the belly is distended with wind, there is rumbling in the bowels, pain in the sides, *no dejections*, but, on the contrary, the bowels are constipated." This forbids the interpretation of the term cholera as bile-flux. These are puzzles which we are unable to solve.

It is to be noted that Sydenham was not singular in omitting all mention of color in the evacuations of cholera. Even Hippocrates or rather his immediate followers were equally negligent. Thus in Book V. of the *Epidemics*, put under the category of "not genuine" by M. Littré and other critics, we have report of three cases of cholera, but the bilious character of the vomiting only is mentioned in the second, and no color is mentioned of the downward evacuations in any of them. The cases are :—

Case 1.—"At Athens a man was seized with cholera. He vomited, and was purged and was in pain, and neither the vomiting nor the purging could be stopped; and his voice failed him, and he could not be moved from his bed, and his eyes were dark and hollow, and spasms from the stomach held him, and hiccup from the bowels. But the purging was much more than the vomiting. This man drank hellebore with juice of lentils; and he again drank juice of lentils, as much as he could, and after that he vomited. He was forced again to drink, and the two (vomiting and purging) were stopped: but he became cold. He was washed with plenty of (hot) water down to the genital organs, until the upper parts also grew warm, and he lived; and next day he took some gruel (meal with water)."

Case 2.—"Eutychides had a choleric affection, which ended in a tetanic seizure of his legs, along with purging. He vomited for three days and nights a quantity of coloured and very red bile, and he became powerless and oppressed with nausea, and he could retain nothing—neither drink nor food; and there was complete retention of urine and there was no passage downwards. By vomiting soft dregs were evacuated, and they also passed downwards."

Case 3.—"It happened to Bias, the pugilist, who was a great feeder, to have a choleric attack from eating flesh. * * In summer reign choleric affections and intermittents."

From the meagre report of the third case it is difficult to say what its actual nature was. From the cause assigned for the origin of the disease, namely, eating of flesh, and from the fact of the summer being the season when choleric affections are said to prevail, we may safely say, it was very likely the disease which Sydenham has described. As regards the second, from the bilious character of the vomiting at least, we must come to the same conclusion. As regards the first case, it was indeed a very severe disease and had symptoms,—failure of the voice, darkness and hollowness of the eyes, coldness of the surface, and cramps,—which are, indeed, some of the characteristic symptoms of the true cholera, but it is impossible to say whether the evacuations,—the vomitings and the purgings,—were of the nature of the cholera dejecta of the present day. Besides, as in the severe forms of Sydenham's cholera morbus, the symptoms here mentioned as characteristics of the Hippocratic disease, are also present, we are inclined to believe that even this first case was of the same nature.

Hippocrates flourished between 460 and 357 B.C. Physicians after him, whether belonging to his school or not, had written

about cholera, very nearly in the same way as he or his immediate disciples did. Thus Aretæus, who flourished about 100 A.D., defines cholera, as we are told by Dr. Adams, to be a retrograde movement of the matters in the body upon the stomach and intestines, consisting of a discharge upwards and downwards of bile, which, if the disease proves fatal, becomes black; and, at the same time, the extremities are cold, with profuse sweats, pulse small and dense, constant straining to vomit, and tenesmus. He also makes mention, among the symptoms, of spasms and contractions of the muscles in the legs and arms, borborygmi, tormina, and syncope. The complaint is occasioned by continued indigestion, and proves fatal by superinducing convulsions, suffocation, and retching.

According to Cælius Aurelianus, who flourished about 200 A.D., cholera is a disease in which there is flow of bile by the mouth and the bowels, and "the bile which is vomited is at first yellow, afterwards green, and at last black." Paulus Æginata, who flourished about 600 A.D., describes cholera as "an immoderate disorder of the belly, with discharges upwards and downwards, arising from continued indigestion," and makes no mention of color of the discharges. The Arabian physicians simply followed the Greek and Latin authorities, and there is nothing new in their writings about the disease.

Modern European authors, evidently deriving their knowledge of our ancient medical writings from men but ill-acquainted with those writings, have thought that the disease described as *Visuchiká* by Charaka and Susruta, and following them by modern writers such as Bágbhatah and Bhába Misra, corresponds to the cholera of the present day. Charaka, the oldest of our medical authors and who flourished probably before Hippocrates, has described *Visuchiká* as simply a disorder of indigestion in which "the undigested food passes upwards and downwards." Susruta, also an ancient but later authority than Charaka, is fuller and more precise. According to him, "that form of indigestion, in which the wind torments the body as with needles, is called by physicians *Visuchiká*. Those, who are moderate eaters and are versed in the *Shastras* (scriptures), do not get the disease. Those, who are greedy, ignorant, and have no self-

control, get it. In this disease occur fainting, purging, vomiting, thirst, colic, vertigo, cramps, yawning, burning, discoloration, shivering, pain in the heart, headache." Here we have an assemblage of symptoms, some of which, indeed, are those of the true cholera, but others, such as shivering, pain in the heart, and headache, are not. Some of the symptoms, such as coldness of the surface, huskiness of the voice, sunken eyes, profuse cold perspiration, &c., which are characteristic of cholera are not at all mentioned under *Visuchiká*. Hence it would require a stretch of the imagination to see in *Visuchiká*, as we have it described in ancient Hindu medical works, any but the remotest resemblance to the modern disease, whereas the merest comparison will show that the Greek cholera very nearly resembled the genuine cholera in all but its epidemic virulence.

We have been at so much pains to ascertain the nature of the disease which has prevailed sporadically in the world for so many centuries, perhaps not less than twenty-five, under the name of cholera, in order to see if there is any real distinction between this disease and the disease to which the same name has been given, but which has been prevailing with epidemic virulence for only a little over a century. From the survey we have taken we are compelled to say that the two diseases, though allied, are distinct. In the former, the rice-water stool and vomiting are the exception, coming on very rarely at the end in only the gravest cases, the stool and the vomiting being green of some shade or other throughout; whereas in the latter the rice-water stool and the vomiting are the rule, coming on at once or after the first evacuation or two, even in the very mildest cases. In the former the evacuations are passed with pain and effort; in the latter they are passed with the greatest ease, and as if with no knowledge of the patient, being simply poured out.

We lay special stress upon the almost sudden and painless discharge of rice-water liquid from the stomach and bowels, devoid of all trace of bile, as pathognomonic and therefore truly diagnostic of the modern disease. The disease should be distinguished from the old classical cholera morbus by some qualifying epithet connotative of one or more of its characteristic phenomena. The name malignant cholera, cholera maligna, which has been given to it by some authorities is not inappropriate. Almost always

originating in India, before its epidemic spread to other countries, it has been called Indian Cholera, Cholera Indica. Some, believing that it has other countries of Asia as its endemic home, have called it Cholera Asiatica. So that these are the three names by which it is distinguished from the old and milder disease, which is also called by other names such as Cholera Nostras, Cholera Europea, being thought to be chiefly prevalent in Europe; but it has its prototype in India and other countries of Asia, and therefore these names are not quite appropriate. Indian authorities have called the milder disease cholerine or choleraic diarrhœa. We shall call the graver disease by the simple name of Cholera, and the other disease by the name given to it by Sydenham, that is, Cholera morbus.

Now for the other diagnostic symptoms and signs. Next in importance to the character of the evacuations is the rapid sinking of the vital energies, culminating in collapse, which gives a peculiar cadaverous appearance to the whole body, a livid cyanotic discoloration of the surface, sunken eyes cheeks and temples, remarkable reduction of temperature, even the breath mouth and tongue being icy cold. Simultaneous with the setting in of collapse, and, indeed, as one of its manifestations, there is suppression of the urine, which is a rare symptom in cholera morbus, coming on later and in only the gravest cases, but a constant symptom in true cholera, and which declares itself almost immediately after the first rice-water evacuation.

The only other disease with which cholera may be confounded is the rare form of malarious fever in which, in the cold stage, choleraic symptoms develop and take away life in a short time. Sometimes the resemblance may be so great as to lead even practitioners of great experience to make the mistake. This occasional resemblance of the two diseases has led some practitioners, overhasty in making generalizations, to look upon cholera itself as indeed a form of malarious fever with the algide stage predominant. But a careful study of the history of the two diseases will remove the illusion. Cholera often occurs in places where there is no malaria; it originates in causes which by no means can be called malarious. But the disease under consideration occurs only in malarious localities, specially in places which have but recently become malarious. The want of suppression of the urine, of

cramps, of cyanosis, marks the febrile disease, in contradistinction to cholera in which they form the most essential symptoms. I do not speak of want of collapse and want of high mortality as characteristic of this form of malarious fever, as they are often observed in cases at the beginning of an epidemic of such fevers, death taking place in the cold stage within twelve hours. People, who had, after the day's work, gone to bed apparently well, were found dead in the morning. That these were cases of malarious fever terminating fatally in the algide or cold stage was proved by the fact of their having been associated in the same house with cases of pronounced fever of the malarious type and of the prevalence of the disease in the locality.

There are no other diseases than these, cholera morbus and pernicious malarious fever at the first outburst of an epidemic, with which the genuine cholera may be mistaken. It may be mistaken, however, with other pathological conditions brought on by irritant poisoning, which may be truly called so many drug-diseases. Among the inorganic poisons we may mention, as the most commonly used for homicidal or suicidal purposes, arsenic. I know of two undoubted cases of arsenical poisoning which occurred some years ago in Calcutta, and which were treated as cholera by some distinguished physicians of the city. Next we have corrosive sublimate, antimonium tartaricum, the mineral acids especially the nitric, the drastic purgatives such as the sulphates of magnesia, of soda, &c. Among the vegetable poisons we have croton oil, castor oil and specially castor seeds, elaterium, tabacum, ergoted rye, poisonous fungi, decomposed vegetables, &c. Among the animal poisons we have those resulting from rotten meat, rotten fish, decomposed milk, mostly by bacterial action. There are some shell-fish which are poisonous by themselves, and produce choleraic symptoms even in the fresh state without undergoing decomposition.

For those who are tolerably versed in toxicology it is not difficult to distinguish between cases of the genuine disease and cases of poisoning. To give the differentiating characters of the pathogenetic actions of individual poisons would be out of place here. We shall have to come to it when we treat of remedies for cholera. The great merit of the homœopathic system, it should be remembered, is that its foundation is laid upon a

materia medica which consists of a detailed and systematic record of the pathogenetic actions of whatever can disturb and disorganize healthy function and structure, which necessarily include violent poisons as well as less violent and milder substances. As a general rule, however, to enable practitioners to make the distinction, it may be mentioned that, as pointed out by Griesinger and others, the *order* in which the symptoms occur in cholera differs from that in which they occur in cases of poisoning. In cholera, diarrhœa *precedes*, in poisonings, *succeeds*, vomiting. In cholera, the stools very rarely cease to be watery and very seldom becomes dysenteric except after treatment; in poisonings, the watery stools are very soon followed by dysenteric ones, dark, bloody, offensive, indicative of an inflammatory condition of the intestines. In cholera, the stools are painless, in poisonings, they are attended with gripes and colic and voided with tenesmus and heat. In cholera, the abdomen is sunk, and never tympanitic nor tender to the touch, except after treatment with astringents and opium; in poisonings, tympanites and tenderness of the abdomen are the rule, the exceptions are very rare. In cholera, the suppression of urine is complete almost from the beginning, and the patient has no urging to urinate; in poisonings it comes on gradually, and even when it is complete there are attempts to void the urine and these attempts are attended with vesical tenesmus and strangury. In doubtful cases, the previous history of the patient as regards diet, &c., an unusual taste, marks of corrosion in the mouth and tongue, will clear up the diagnosis which would be rendered certain if any poisonous substance could be detected in the vomited matters or in the stools.

Hitherto we have dwelt upon what may be called the *clinical* diagnosis of cholera. Modern writers on the disease have relied upon two other methods or means of diagnosis, which have been known as *epidemiological* and *bacteriological*. The epidemiological diagnosis is based upon the fact of the prevalence of the disease as an epidemic at a particular locality, affording presumptive evidence of a mild case being one of true cholera and warning the practitioner to be on his guard in the treatment of the case. The practitioner would certainly be wrong in treating all mild cases of diarrhœa as cases of cholera simply

because they occur simultaneously with cases of the true disease; but he would do well to watch his cases with more than usual care and attention.

As regards the bacteriological diagnosis of cholera it would appear from what we have presented to our readers about its bacteriology that this method in its negative aspect ought not to weigh against positive clinical evidence. In other words, in cases which present clinical features of the disease we ought not to throw doubts on its true character simply because we fail to detect what we look upon as the pathogenic bacteria. But apart from this serious drawback in bacteriological diagnosis, there is another drawback which is no less serious and which deprives it of practical utility. This drawback consists in the time taken to arrive at a positive pronouncement. Even experts must work continuously for days before they can decide whether they are dealing with the actual pathogenic comma bacilli, or other similar but non-pathogenic bacilli. Such diagnosis, it must be evident, does not help at all in the treatment of the cases which furnish the materials for bacteriological investigation, and therefore for these cases it is useless. If positive results are arrived at, it may establish the character of an epidemic, and that is all. But if negative, it is valueless altogether.

Prognosis.

Prognosis is foreknowledge of the course and termination of a disease. This knowledge is a product of several factors. These are: 1. knowledge of the nature of the disease and the degree of its severity, 2. knowledge of the powers of resistance to, and of struggle against, morbid processes possessed by the patient, 3. knowledge of the method of treatment adopted, and 4. knowledge of the general environment of the patient.

1. As regards the nature and degree of severity of the disease, these can only be ascertained by the symptoms manifested by the patient, including the physical signs of structural lesions.

2. As regards the powers of resistance and opposition, we must say they are not easy of determination, inasmuch as the measurement of vitality possessed by an individual is in itself a difficult problem and requires the consideration of so many influencing circumstances, such as age, sex, habits, previous ailments, &c.

3. The method of treatment, we need hardly say, exercises a considerable influence on the progress of all cases. It is notorious that all methods are not equally successful, but for the practitioner who adopts a particular method, that method must be in his opinion the best, and his prognosis of a case must be in accordance with the degree of success he has met with by the method in previous cases.

4. Next to the method of treatment, the environment of the patient determines the progress of his disease. With the best of treatment an insanitary surrounding may and often does stand in the way of successful issue of a case which might otherwise have been obtained. We, therefore, look upon attention to the hygienic condition in which the patient is placed as not less important than the right prescription of remedial agents. Indeed, in the eye of the careful physician, this should form an essential part of the treatment itself.

To apply these general observations to the formation of a correct prognosis of a case of cholera:

The nature and severity of the case will be revealed by the symptoms, and these will tell us at what stage we have undertaken to treat the case. If in the stage of preliminary diarrhœa, a favorable prognosis may be given. If in the stage when the rice water stools and vomiting have just commenced, we must be more guarded in our prognosis; the more copious and exhausting the evacuations the more serious the case must be looked upon. If after a few trials of remedies, the discharges show signs of abatement we may give a hopeful prognosis; but if the opposite is the case, if, in spite of our remedies, the evacuations go on, then without giving up hope we must be guarded in our utterances. If, in spite of all that we do, collapse sets in rapidly, the pulse disappears at the wrist, the coldness of the surface and of the breath becomes pronounced, then the prognosis must be very unfavorable, more unfavorable than if we had begun to treat the case in the stage of collapse. But we must not forget that cases do occur which, after running on to the profoundest collapse in spite of previous treatment, do recover under persistent continuance of treatment, so that under these circumstances we must not absolutely give up all hope. A very unfavorable symptom in collapse is embarrassment of the respira-

tion, often amounting to gasping. This is indicative of the arrest of the pulmonary circulation through the formation of clots in the vessels of the lungs beginning at the right heart and the pulmonary arteries. It would seem that there can hardly be any remedy for this condition, but, as we shall see under *Treatment*, even this condition has been recovered from. Perhaps in cases of recovery the clotting had just commenced and had not become firm enough to be irremediable.

When under treatment reaction sets in, or if we get to treat a case at this stage, the prognosis becomes more hopeful, but we should not be too sanguine so as to be off our guard. This is the stage when the greatest care is necessary in the matter of drugging and dieting of the patient, for the slightest error in either would bring back a relapse or set agoing the reaction in an abnormal direction, so as to bring on sequelæ which may be very tedious and troublesome and even end in death.

Prognosis should also be based on an estimate of the vitality of the patient at the time of the attack. And in order to arrive at this we must first of all take into consideration the age of the patient. The very young with budding and necessarily very delicate vitality, and the very old with declining and exhausted vitality, can only offer a feeble resistance to the onslaught of the disease especially when of a violent character. In regard to such patients the prognosis must be of a guarded nature. Secondly, the sex of the patient does influence the course of the disease. We believe the female patient, especially if exhausted by numerous childbirths, are more likely to succumb than the adult male. It is a dangerous thing for a female in the family way to be attacked with cholera, as it may and often does lead to abortion and miscarriage and these are serious complications. Thirdly, a knowledge of the previous habits of the patient must influence our prognosis. A man whose constitution has been shattered by a drunken and dissipated life has less chance of recovery than one who has always been sober and temperate. So also a man who has been debilitated by serious and exhausting diseases, such as dyspepsia, chronic diarrhœa, enteric fever, malarious fever, organic diseases of the kidneys and of the liver, &c., runs a great risk when he gets an attack of cholera. Curiously enough, patients with malarious enlargements of

the liver and spleen, or with dropsy, get well of their original complaints if they recover from cholera.

The method of treatment adopted in a particular case must greatly influence its prognosis. Notwithstanding its signal and admitted failure in the treatment of this terrible scourge, it is not a little singular that the old school will not look beyond its narrow horizon. "The drugs and compounds which have been administered empirically in cases of cholera," says Dr. Macleod, in Allbutt's *System of Medicine*, "are legion. It is safe to assert that not one of them has established a claim to cure the disease." This is very damaging to the reputation of the dominant school, and under its method of treatment the prognosis must be necessarily on the whole an unfavorable one, except for very mild cases. Dr. Macleod further admits "the fact that about one-half of those attacked with cholera recover with or without treatment," which shows that the treatment, as pursued by his school, has little or no influence on the disease. No system of treatment, therefore, can have any claim to the gratitude of mankind which cannot show an average mortality of less than 50 per cent. Can homœopathy have such a claim? We sincerely believe it has, so much so that this fell disease has been the pioneer of the system throughout the world.

In giving our prognosis of a case we must take into our calculation the influence of its surroundings. It is generally the poor who are the victims of the disease; and the high mortality among them is greatly due to their insanitary surroundings,—the dark, dingy, damp rooms in which they live and the insanitary condition of the locality in which their huts are situated, full of offensive, poisonous gases resulting from all sorts of decomposition. In some instances where I could remove the patients to better localities or even to better and more airy rooms I was instrumental in saving their lives. In one case it was a most valuable life, and I remember the event with lively gratitude to the Almighty for having permitted me to be so instrumental. This was in the early days of my practice, when I had heard of homœopathy only to denounce it, and the case was that of no other person than the late Babu Keshub Chunder Sen. He got cholera while he was occupying one of the lower apartments of his family house, the windows of

which overlooked a dirty bustee. He was under the treatment of the late celebrated Dr. Doorga Churn Banerjea, and I was attending on the patient as a friend. The case was getting worse, and on coma supervening, I whispered into the ears of Dr. Banerjea that in my humble opinion the only chance for the patient was his removal, if that were possible, to an airy room in the third storey of the house. The Doctor, for whom I had the highest respect, looking upon him as father and preceptor, and who loved me as his own son, happily agreed with my views, and without loss of time and with all possible care the removal was accomplished, and almost from the moment the patient began to rally, and lived to be one of the most distinguished Indians of the nineteenth century. In a second case, that of a Mahometan female patient, the removal had to be done for more than a mile, and in my intense anxiety I had to walk along the palki, keeping my hands on the wrist of the patient. This case happily recovered. In a third case, that of a well-to-do Hindu lady, I had to carry her over six miles from Baranagar to her home in Calcutta. She also recovered. And I am sure, none of these cases would have recovered, had I not taken the risky step of removal, in one instance from the ground floor to the third storey, in another for over a mile through the streets of Calcutta, and in the third for six long miles. I shall never forget the intense anxiety I felt when helping in the removal. I have cited these cases to show the real influence which the environment of a patient exerts over the progress of his or her case, but I dare not advise the imitation of the practice I had adopted in counteracting it when deleterious.

Dr. Macleod has well remarked that "the violence of vomiting and purging are not necessarily indicative of a severe seizure, but their persistence is apt to result in delayed convalescence or fatal exhaustion." The following summaries given by him of signs of good and of evil omen observable at every step in the progress of a case are well worth bearing in mind:

"*Evil Signs,* in the order of the stages are—Sudden seizure, early prostration, early stupor, quick advent of collapse, restlessness and fighting for breath, failing pulse, great depression of temperature, prolonged cold stage, hyperpyrexia, severe abdominal pain, blood in vomit and stools, persistent suppression of

bile and urine, permanent muscular contractions, jaundice, lung complications, recurrent purging and vomiting, delayed restoration of body heat, typhoid symptoms and indications of uræmia or cholo-uræmia, insomnia and delirium." According to Dr. Copland, "An oozing from the mouth of the fluids from the stomach, unconscious evacuations or relaxation of the sphincters, the breathing consisting of convulsive sobs or being stertorous with puffing of the cheeks or lips, and inability to swallow, indicate approaching dissolution in the cold or early period of the disease." To these symptoms we would add one which we have almost invariably observed to be one of evil omen. It is a particular attitude of the body, the patient lying in a semi-unconscious state on his back with one leg placed on the opposite knee raised to the full height of the thigh above the bed. We have seldom seen patients presenting this attitude recover. It is difficult to explain why this should be so.

"*Good Signs* are—Maintenance of pulse during collapse, moderate depression of temperature, early and not excessive reaction, return of color in the motions, cessation of cramps, restoration of urinary secretion, resumption of warmth and dryness of the skin and normal color and plumpness of face, quiet breathing, tranquillity, sleep." Dr. Copland has observed that, "a thread of pulse, however small, is always felt at the wrist, where recovery from this state (collapse) is to be expected. Hiccough coming on in the intermediate moments between the threatening of death and the beginning of reaction, is a favorable sign, and generally announces the return of circulation."

Mortality.

The mortality of cholera has been taken as 50 per cent. of all cases, irrespective of the degree of their severity, with a tendency towards a higher than a lower figure. From what we have said under Prognosis the mortality depends upon a variety of circumstances besides their intrinsic severity or mildness: The intrinsic mildness or severity of the disease depends upon the degree of virulence of the generating poison. The circumstances which modify the intrinsic nature of the disease, converting an originally mild into a severe case, and *vice versâ*, are what we have considered under Prognosis, namely, age, sex, &c. Now

if we take cholera as a whole, the old school estimate of its mortality can only be held to be correct under the treatment of that school. Under a better system of treatment, which Homœopathy undoubtedly is, the mortality must certainly be considerably less. There ought not to be any death in mild cases, not more than fifty per cent. in cases affecting the very young and the very old, and not more than twenty-five per cent. in the cases of the young and the adults. An average mortality from all cases ought not to exceed this last percentage. Under proper hygienic precautions and under judicious homœopathic treatment the disease both in its epidemic and individual manifestations ought to be more under control than it has hitherto been. And considering the admittedly helpless and impotent state of old school therapeutics, all civilized governments ought no longer to continue to be the idle spectators of the ravages of a disease which still continues to be the greatest scourge of mankind, simply because the dominant profession refuses to be guided in its treatment by the unerring therapeutic law which was discovered by one of its own brightest members so long as upwards of a century ago.

As a general rule the mortality at the beginning of an epidemic is much greater than at the end, but this is not always the case. An epidemic may begin with very mild cases and end with fatal ones, and then disappear suddenly. Sometimes the fatal cases occur in the middle of an epidemic, the beginning and the end being characterized by mild cases.

CHAPTER II.

TREATMENT.

General Observations.

The indispensable requisites in the treatment of cholera, as indeed of every disease, are a knowledge of its pathology, or a right interpretation of its phenomena, in other words, of the symptoms objective and subjective with reference to their seats in the organism; a knowledge of its natural history or of its course when left to itself; and finally a knowledge of the properties of drugs or of their physiological and pathogenetic actions.

In speaking of a knowledge of its pathology as one of the requisites in the treatment of cholera, I am aware that I am not quite in accord with the Founder of Homœopathy and with a large section of his followers even in the present day. Pathology, at the time of Hahnemann, was so crude, was indeed so wide of fact, so full of "empty speculation and hypotheses concerning the internal essential nature of the vital processes and the mode in which diseases originate in the invisible interior of the organism," that it deserved all the condemnation he hurled against it. But it is so no longer. Though a large portion of the organism is still invisible, a larger portion has been laid bare by the microscope and other modern appliances, and we have got at the primitive elements of living matter, and therefore at the very threshold of life. The interior of the sanctuary has not been reached and may perhaps never be reached it is true, but we are approaching it nearer and nearer. To neglect this knowledge of the structure and functions of the parts, the organs and other constituents, of which the living organism is made, is for the physician to neglect the knowledge which alone can render essential help in the correct interpretation of the symptoms of disease and the symptoms of drugs, without which the treatment of disease must be mainly a groping in the dark.

That a knowledge of the natural history of a disease is a great help in its treatment, must be admitted except by the thoughtless. If we can know how far unaided nature can restore harmony when disturbed by disease, and by what processes, we shall know to give due credit to nature and to art when cures

are brought about, we shall know when to assist nature and when not to thwart her, we shall know to hold our patience and not be alarmed and alarm our patients by unnecessary fears, at the same time that we wait and watch. But this knowledge of the natural history of disease is almost impossible of attainment, except by the purest accident, in civilized life. Very few patients are left without any medical treatment. Even the poorest of the poor are taken care of by their neighbours or by the Government. The physician, if he is not a meddlesome practitioner, by judicious respite given to the patient, can attain to this knowledge partially at least, and even this will be of benefit to him.

As regards the necessity of a knowledge of drugs or of the weapons with which we have to combat disease, it is so self-evident as to need no argument to urge it. Whatever rule we follow in using them we must know what they are, what they can do, how they act in health and disease, before we can use them with any advantage. Yet singularly enough before the time of Hahnemann, physicians were satisfied with a most imperfect knowledge of them, and even of this imperfect knowledge they did not avail themselves of the whole of it, they would use a drug for one or two of its properties, believing that the rest of their properties would remain quiescent in the system. This has been found to be a delusion. The drugs obey their own laws and not the ignorant behests of the physician. Hence, in order that we may use them with success we must know all about drugs that may be possibly known.

As I have already said, cholera is but the generic name for a variety of diseases. Its causes are not one, but manifold. Each case should be studied by itself. Each case will be found to have an individuality of its own resulting not only from the peculiarities of the individual, but likewise from the nature of the cause or causes which have given it birth; and therefore, while the physician should never lose sight of the essential general nature of the disease, he should always observantly and anxiously watch the peculiarities of each individual case. The late Dr. J. B. Dake, in his article on Asiatic Cholera, in Arndt's *System of Medicine*, has thus remarked on the medicinal treatment of the disease: "The most

successful practitioner will ever be the one who, quickly recognizing the foe, selects and adheres to well-tried remedies, nothing doubting as to good results. He who takes time to search a repertory with a long list of drugs, each of which may have displayed some symptom similar to one characteristic of cholera, will often find his patient fatally collapsed before his individualizing pursuit is satisfactorily ended." The routine here recommended by Dr. Dake has brought disgrace on homœopathy even in the treatment of cholera. It is not always the remedies tried in previous cases that are successful in new cases unless the correspondence is close. We should be doing Hahnemann a wrong, and indeed it would be declaring homœopathy incapable of growth and development, if we were to believe that the few remedies recommended by the Master are all the remedies for cholera. If we were to stick to them, and search for no newer remedies we would court signal failure. Of course it would not do to search for the right remedy at the bed-side of the patient. The practitioner should be fully armed with a knowledge of all possible remedies, and then consultation of the repertory even at the bed-side, in case of a doubt, would prove to be a great gain and not a serious loss of time. It is to afford this knowledge that the present treatise is written.

The homœopathic physician, though equipped with an infinitely better armoury, because filled with instruments of precision, would find it not unprofitable to possess a knowledge of the armoury which his colleagues of the other school are still employing for the same purpose. I therefore here take a glance at the

Old School Treatment.

There is a singular "dismal unanimity of all medical authors" of this school who have had cases of cholera to treat, in declaring that "no treatment avails to arrest the fully-developed disease." I have already quoted the opinion of Dr. MacLeod, one of the greatest living Indian authorities on the subject. I shall now present the reader with the opinions of a few others.

The late Sir Thomas Watson said: "Never, certainly, was the artillery of medicine more vigorously plied—never were her troops, regular and volunteer, more meritoriously active. To many patients, no doubt, this busy interference made all the

difference between life and death. But if the balance could be fairly struck, and the exact truth ascertained, I question whether we should find that the aggregate mortality was in any way disturbed by our craft."

Lebert says: "Cholera in its well-pronounced, typical, and perfectly developed form slays the half of all persons attacked; indeed even a greater number at the extreme limits of life and under unfavorable conditions;" and that "internal medicines, according to all experience hitherto, have proved useless during the attack."

Dr. Alfred Stillé says: "If regard be had to the various methods and particular medicines which have been used in the treatment of cholera, it will appear that in hardly any other acute disease has a greater number or variety been employed. If, on the other hand, we endeavour to learn what measures have been really and generally curative in cholera, and what are they to which, on the occurrence of an epidemic of the disease, we may turn with confidence in their power to cure, the result of the investigation is disheartening, and adds to the accumulated proofs that the power of medical art is exceedingly restricted." In the case of the disease in question this is not a matter for regret or surprize to Dr. Stillé. He thinks it must be so, it could not be otherwise. "To this conclusion," says he, "we must assent at whatever cost to a faith which is strong in proportion to the ignorance out of which it grows. Nor, if we consider the matter rationally, ought we to be surprized or humiliated on account of the comparative helplessness of medicine in this disease, since, if we reflect upon it, the case is by no means peculiar or exceptional," because, according to him, "the various fevers are at times utterly uninfluenced by the most rational and judicious treatment. Nor does any one bring a railing accusation against medicine when accident fatally damages a part essential to life." He compares the destruction of the intestinal mucous membrane in cholera to the destruction of the skin in a scald or a burn, and argues that just as in the one the restoration of the skin is impossible, so is the restoration of the mucous membrane in the other, and therefore "it is quite futile to address any treatment to this organ." What becomes of this theoretic

comparison when he himself adds shortly after: "And yet there is some encouragement in the fact that recoveries sometimes occur from even the most desperate state of collapse and under the most dissimilar methods of treatment; so that the physician is warranted in not yielding to discouragement and cheering his patients with hope even to the end."

The THERAPEUTICS of cholera, as carried on by the dominant school in the present day, may be brought under the following heads:—

1. Empirical, adopted not for any particular reason that can be shown, or because it has been found beneficial in previous cases. The exhibition of calomel in all cases is illustrative of this mode of treatment of cholera.

2. Rational, because adopted with some reason, or, at least, some show of reason, and is either:—

(1.)—Etiological.
(2.)—Pathological.
(3.)—Etiologico-pathological.

(1.)—The etiological therapeutics is directed towards the cause, and consequently varies according to the view taken of the cause.

Those, who hold that cholera depends upon the presence in the system of a material poison which the system endeavours to throw out by the evacuations, advocate the *Eliminative treatment*, by which it is proposed to assist nature in her expulsive or eliminative efforts. Purgatives and emetics are accordingly the remedies employed by these physicians. Blood-letting is the most heroic measure of the eliminative plan. It aims to relieve the system of poisoned blood and the internal organs, especially the lungs, of congestion. Those, who believe that cholera depends upon the action of some living germ upon the mucous membrane of the alimentary canal, advocate the administration of drugs which have a germicidal action, such as sulphuric acid, carbolic acid, corrosive sublimate, &c. And thus we have the *Antiseptic plan of treatment.*

Those, however, who while they believe that cholera is the result of some subtle poisoning of the system, look upon the evacuations as exhaustive discharges caused by the specific deleterious influ-

ence of the poison itself upon the digestive tract, adopt the antidotic treatment. This may be either—

(i.)—Antidotic of the poison itself; or

(ii.)—Of its effects; or,

(iii.)—Both combined.

The antidotic treatment is essentially *Antiseptic*, and, according to the peculiar ideas of the practitioner, may take on the forms of the *Stimulant* and the *Antispasmodic* plans.

(2.)—Pathological therapeutics has reference only to the condition of the system as an effect, without any reference to its cause, and therefore corresponds to the second head of antidotic treatment, without ostensibly being antidotic. Pathological therapeutics is generally a combination of the *Astringent plan* to check the evacuations, of the *Stimulant plan* to uphold the vital energies, of the *Antispasmodic plan* to relieve the spasms, and of what from want of a better name we may call the *Restorative plan* to restore to the system the water and salts it has lost by the watery evacuations.

(3.)—It is etiologico-pathological alone which takes cognizance of the cause as well as of the effect, and thus corresponds to the third head of antidotic treatment. This has led to a combination of all possible plans; of those previously mentioned, with the addition of the *counter-irritative plan*, consisting of the application of sinapisms and other counter-irritants "to remove morbid action from within to the surface where it may be less hurtful and more under control."

Thus there are seven different methods or plans adopted by the old school in the treatment of cholera, *the eliminative, the antiseptic, the stimulant, the antispasmodic, the astringent, the restorative,* and *the counter-irritative.* To these an eighth might have been added which was reserved for an Italian physician to propose and carry out, and which, had it been in vogue, we might have called the *mechanical plan*, inasmuch as it consisted in plugging the anus to prevent the transudations from the intestines from flowing out! The drugs and measures under each of the seven methods are too numerous for profitable mention. We will consider only a few and the most prominent of them.

For all these plans of treatment success has been claimed, even for blood-letting which no sane man would, it might have been

expected, have thought of resorting to, considering the condition and small quantity of blood in the system, as revealed by post mortem examinations. But this was extensively practised during the earlier epidemics, especially in India. According to Dr. Raimann, of St. Petersburg, "blood-letting, with calomel and opium, and external heat and irritation, were amongst the most successful means employed against the disease in Russia." According to M. Vos, who practised in Batavia, blood-letting was of service amongst Europeans only, being injurious to the natives. The following instance, recorded by Sir Ranald Martin, of the effect of venesection, is worth reproducing. "On visiting my hospital in the morning, the European farrier-major was reported to be dying of cholera. I found that during the night he had been drained of all the fluid portion of his blood. His appearance was surprisingly altered; his respiration was oppressed; the countenance sunk and livid; the circulation flagging in the extremities. I opened a vein in each arm; but it was long before I could obtain anything but trickling of dark treacly matter. At length the blood flowed, and by degrees the darkness was exchanged for more of the hue of nature. The farrier was not of robust health, but I bled him largely when he, whom not a moment before I thought a dying man, stood up and exclaimed, 'Sir, you have made a new man of me.' He is still alive and well." It would be neither fair nor charitable to say that this man recovered *in spite of* the venesection. It behoves us to find-out the rationale of the cures in such cases. Dr. Copland had the good sense to speak of blood-letting as having been attended "with very equivocal benefit; for it was only in slight cases, or in an early stage of the disease, and in young, plethoric and robust persons, that it *seemed* to be of service; and in these either equal advantage would have been derived from other means or recovery would have been brought about by the powers of the constitution."

The intravenous injection of warm water with or without salts, or of defibrinated blood, was practised in the early days of cholera, especially in India, and first proposed, if we mistake not, by the late Dr., afterwards Sir, William O'shaughnessy, and the first effect was indeed marvellous. Dr. Mackintosh of Edinburgh is reported to have treated 156 very bad cases by this

method with 25 recoveries. Sir Thomas Watson has related one case which he had himself witnessed. "The patient was a young man, who was nearly moribund apparently. His pulse had almost, if not quite, disappeared from the wrist; his voice was faint and husky; he was very blue, and his visage was ghastly and cadaverous: in one word he was in an extreme state of collapse. Out of this he was brought in a few minutes by injecting warm water into one of the veins of his arm. The pulse again became distinct and full; and he sat up, and looked once more like one alive, and spoke in a strong voice. But he soon relapsed; and a repetition of the injection again rallied him, but not so thoroughly: and in the end he sank irretrievably. Dr. Babington told me of a patient whom he saw, speechless and all but dead, and whose veins were injected. He then recovered so as to sit up, and talk, and even to joke, with the bystanders: but this amendment did not last either."

Dr. C. N. Macnamara *(Treatise on Asiatic Cholera)* speaking of intravenous injections at the hands of Mr. Little in 1866, with water containing chlorides of sodium and potassium, phosphate and carbonate soda, and a few drops of alcohol, says: "The supply of fluid to the dehydrated blood seems to revive the patient at once; but, unfortunately, the liquid too often drains away through the walls of the intestinal canal, as fast as we pour it into the veins. But in desperate cases the plan merits a far more extensive trial than has yet been afforded it." According to Sir Thomas Watson, "Yet even this temporary recovery might be sometimes of great importance, might allow a dying man to execute a will, for example." He adds: "and some of the persons revived got *ultimately well*. We had for sometime a woman in the Middlesex Hospital acting as a nurse, who had been rescued, when at the verge of death in cholera, by the injection of warm water in the veins." On account of the relapses following the injections, "Cox, of Shanghâi, has proposed continuous injection until reaction has been fully established. But this measure is still on trial."

On each of the plans of treatment Dr. MacLeod has, in his excellent article on Cholera in Allbutt's *System of Medicine*, offered some very judicious observations. Thus under *the*

eliminative plan: "Apart from the well-established fact that purgation is of itself exhausting, especially so in the early stages of cholera, when it ought to be most effective and beneficial, it is questionable whether it is wise to remove materials artificially from the intestinal tube—such, perhaps as leucocytes or their alexins, or innocuous bacteria—which may tend to neutralise or destroy the poison of cholera. As a matter of fact, Sir George Johnson's castor oil treatment has been extensively tried and found wanting."

With regard to *the astringent plan* he says: "It is possible that the results thus to be prevented or cut short—the tremendous drain of serum, corpuscles and salts from the veins into the intestinal tube, and the abeyance of absorption—may have a salutary purpose, and within limits a curative function; it is doubtful whether the checking of these discharges is, as a dominant principle, a sound basis of action." Our own experience showed us that the exhibition of astringents is worse than useless in cholera. Very seldom they succeed in checking the evacuations, and when they do, they give rise to dangerous and even fatal tympanites, seriously interfering with the respiratory mechanism. They are generally combined with opium, and opium acts as a deadly poison, for while it fails to exert any influence upon the exudation of serum from the alimentary mucous membrane, it aggravates the tympanites, and seldom fails to affect the cerebral organs.

As regards *the antiseptic plan* he very rightly says that it "may simply result in adding poison to poison, or irritant to irritant; in hindering a process of salutary decomposition, or in destroying the leucocytes or innocuous organisms and their products which may be doing good work. Practically the plan has failed to cure cholera."

Of *the stimulant plan* which aims at averting death from exhaustion, by the exhibition of alcohol, ammonia, ether by mouth or rectum or hypodermically, he says, "even this plan is not without its drawbacks: gastro-intestinal irritation may be increased, mischief may arise during the reactive stage, or perhaps undue disturbance of the collapse stage may be hurtful." Dr. Macnamara is stronger in his condemnation of this plan. "I would here enter an earnest protest against the use of

brandy, or any alcoholic stimulant, in this stage of cholera. I believe these, both theoretically and practically, to be the cause of unmitigated evil. I simply, therefore, mention "brandy, champagne, and the like, in order to condemn their use most emphatically; according to my ideas and experience, it is almost impossible to hit on a more detrimental plan of treatment than that usually known as the 'stimulant' in this form of disease." Stimulants, according to our experience, may do some good, but if the good is not manifest after a few doses, a blind, persistent use of them is sure to be followed by positive mischief, which may be either in the shape of the development or aggravation of the irritability of the stomach, or in that of cerebral congestion.

The antispasmodic plan aims at the removal of spasms not only of the voluntary muscles constituting the well-known cramps of cholera, but also of the involuntary muscles of the intestines causing gripes and colic—the internal cramps, of the bile-ducts preventing the outflow of bile, and of the arterioles systemic and pulmonary preventing the onward flow and oxygenation of the blood and thus interfering with the nutrition of the various organs of the body. The remedial agents and measures used are the administration of sedative and antispasmodic drugs, opium and its alkaloids, the ethers, cannabis Indica, nitrite of amyl and nitro-glycerine, inhalation of chloroform, warm baths, intravenous injections, &c. "This treatment," Dr. MacLeod says, "has proved useful in relieving some symptoms." This and *the counter-irritative plan* "may be useful as auxiliaries." Strange as it may seem the actual cautery to the spine and epigastrium were tried in the early days of cholera, and it is said with some success! We have seen the ordinary counter-irritative treatment sometimes attended with disastrous consequences, especially where calomel had been used. We have seen in blisters to the nape of the neck for the relief of cerebral congestion sloughing of the skin and subcutaneous tissues down to the bone causing death.

After thus taking a survey of the various plans and methods of treatment in vogue in his school, Dr. MacLeod says: "It may be asserted with confidence that in the present state of our knowledge no single principle or plan of treating cholera has met with much success." He thinks it however "possible to lay down certain rules of action which, as experience has taught

us, may aid the patient to undergo the terrible struggle for life which the choleraic process entails." These rules he has formulated under ten heads as follows? 1. Check the preliminary diarrhœa, 2. Maintain physical and physiological rest, 3. Restore a failing circulation, 4. Conserve the body heat, 5. Allay thirst, 6. Relieve distress and pain, 7. Check persistent diarrhœa, 8. Check irritability of stomach, 9. Reduce excessive temperature, 10. Restore the secretion of bile and urine. The first six of these heads have reference to the disease down to collapse; the last four to the stage of reaction. Under each of these heads he gives advice which for his school is sound and judicious.

In order *to check the preliminary diarrhœa* he cannot go beyond combinations of opium with astringents and antispasmodics. The "cholera pill" consisting of opium, assafœtida and black pepper; Goodeve's acetate of lead and opium mixture; the cholera tincture consisting of laudanum or liquor opii sedativus, with catechu or kino, compound tincture of lavender or cardamoms and chloric ether, are mentioned with approval. The patent medicine "chlorodyne, with or without brandy, is an admirable remedy." He very wisely wishes it to "be clearly understood that the treatment now recommended is applicable to the preliminary and evacuatory stages only. When collapse has fairly set in opium and astringents must be stopped; for absorption being now in abeyance they are useless, and in the stage of reaction, when absorption again sets in, they may do harm.

To maintain physical and physiological rest, "the patient must be kept in bed and the evacuations received in a bed-pan. Fussy changing of clothes and bedding must be avoided. Violent rubbing, rough lifting into baths and other beds, transfer to another room or house, and, above all, a journey are dangerous. Medicines, food and stimulants should not be forced on an irritable stomach; they provoke vomiting, excite irritation, and increase exhaustion. The indication is to refrain from anything that may add to the wearying effect of a most weakening malady." From what we have said under PROGNOSIS it will appear that change of room or house, and even a journey, may be beneficial if made under the superintendence of a physician well aware of his responsibility. This is, however, a very risky procedure, and it is questionable whether it ought to be imitated

unless thoroughly assured that otherwise there is no chance for the patient.

For *the restoration of a failing circulation*, he says, the less done the better, if the pulse be maintained in collapse; but if the pulse gradually lose volume and power, becoming feeble and thready, mild stimulants, such as iced champagne and soda-water, weak brandy and water, or ammonia or chloric ether, well diluted, may be given in small quantities, to be withheld as soon as the pulse responds. Should however the pulse become imperceptible at the wrist and hardly perceptible in the brachial and femoral arteries, and cyanosis and dyspnœa are at the same time well-marked, hypodermic injections of sulphuric ether, or cautious doses of nitrite of amyl or nitro-glycerine, followed up by champagne or brandy, may restore the pulse; "but nothing effects this so speedily and surely as intravenous injections of warm saline solutions," repetitions of which he recommends against the inevitable relapse; and though he says, in some cases a permanent cure results," he admits that "experience has shown that the proportion of recoveries has not been materially increased" by them.

The Conservation of the Body Heat.—Nothing is more alarming to the relatives of a patient from whatever disease he may be suffering, than an abnormal fall of the surface temperature, for this indicates that one of the factors of vital activity is ebbing away. In cholera this is so great as to cause the body to be literally ice-cold, and make it feel like a corpse. The great anxiety, therefore, on the part of every one concerned to anyhow raise and maintain the animal heat is natural. The cause of this fall is, as Dr. MacLeod rightly surmises, not one but manifold, —the direct effect of the cholera poison on the nerve centres, the disturbance of circulation, and the loss of fluids from the system are those he enumerates. The first in our opinion is the most potent and next is the almost total suspension of all chemical and vital changes in the blood and the tissues, consequent on the loss of fluids and salts. "It is probably more a sign than a cause of exhaustion." Nevertheless, we must try to prevent the avoidable escape of heat from the body, by maintaining the temperature of the room in which the patient lies at a point not lower than 70° F, and warming the air in the immediate vicity of the patient

by hot bricks or bottles, which is better than loading him with bedding. Friction with dry ginger powder and warm baths are also recommended. Singularly enough the cold wet sheet packing, though not mentioned here, has sometimes proved efficacious, in the hands of some daring old school practitioners, in restoring a failing circulation and raising the body heat.

For *the alleviation of thirst* large draughts of water, so eagerly sought, are prohibited inasmuch as they excite violent vomiting and lead to exhaustion. "Giving lumps of ice to suck is perhaps the best method of quenching thirst; still small quantities of iced soda water, iced champagne and soda, barley or arrow-root water, milk and soda, or teaspoonfuls of cold jelly or clear soup may be administered at short intervals. The injection of fluids into cavities and tissues tends indirectly to fulfil the same indications." The advice given in the joint article on Asiatic Cholera by the author and Dr. Macnamara, in Quain's *Dictionary of Medicine* (3rd Edition, 1902), is different and sounder. While the patient is allowed to eat and suck ice *ad libitum*, even a pound or two in the course of an hour, he should be prohibited from drinking water or any other fluid beyond that which he gets from the ice." No other fluid, milk or soup, soda water or champagne, will be retained in the stomach. We are opposed even to allowing too much ice. It allays the thirst only while being sucked or eaten, and then the more taken the worse the thirst. When such happens to be the case the ice should be stopped.

For *the relief of distress and pain*, as in the alleviation of thirst, no medicine internally is recommended, except that "camphor has been recommended internally, externally and hypodermically," but we are not told with what result. "Hot applications, the warm bath, gentle frictions with anodyne liniments, or even moderate counter-irritation with chloroform, turpentine, or mustard may be tried; but nothing relieves cramps so well as moderate and intermittent chloroform inhalation." In the early stages of the disease hypodermic injection of moderate doses of liquid extract of opium over the seat of the pain may be had recourse to. But the seats of pain are so numerous that the number of such injections will be too numerous to be safe. Dr. Lauder Brunton's recommendation of the hypodermic injection of atropine, on the

assumption of its known antagonism to muscarine which causes symptoms closely resembling cholera, is mentioned only to tell the reader that "sufficient trial has not been made of the drug to warrant its confident recommendation."

The remaining four rules (7 to 10) have reference to the reaction stage. For *the checking of the diarrhœa which may persist*, vegetable astringents, or mineral acids internally, and warm rectal injections of tannin with gum-arabic, are recommended. For *the checking of gastric irritability* "there is no special cure, and must be treated on ordinary principles." For *the reduction of excessive temperature* which proves so fatal in this stage, sucking of ice and the slow injection of bulky cold enemata are recommended for trial. The practitioner is warned "to avoid antipyretics." Tepid baths gradually cooled may be resorted to, "but great caution is necessary in any such adventures." For *the restoration of the biliary secretion* nothing can be done, and fortunately in most cases nothing need be done. The exhibition of calomel in large or small doses is condemned. For *the restoration of the renal secretion*, without which no case of cholera can recover, dry cupping and hot fomentations and poultices are recommended; and while water, milk and water, barley water, &c., should be freely given, diuretics should be avoided. No mention is made of tincture of cantharidis as an internal drug, of which ten drops every hour till a drachm has been taken is recommended, in the joint article in Quain's *Dictionary*.

We have thus presented our readers with the salient points of the old school treatment of cholera from the earliest days of the epidemic at the beginning of the nineteenth century to the present day. The treatment has consisted of almost endless variety which the wit of man, in utter despair from want of a natural guide-law, could devise—from blood-letting and the actual cautery to the plugging of the anus! More than a century's experience has not succeeded in making a single discovery of a specific remedy for the disease. All that this experience has succeeded in doing is to make the practitioner more and more wisely timid and cautious in the use of drugs, which is so far good for patients.

New School or Homœopathic Treatment.

DISTINCTIVE CHARACTERISTICS OF THE TWO SCHOOLS.

The great merit of the therapeutic system of the New School is that it is based upon a law of Nature. This law is the expression or enunciation of a relationship that exists between diseases and their remedial agents. The relationship that was availed of by the founder of Homœopathy consists in the similarity of the symptoms of the disease with the symptoms produced by drugs in the healthy human organism. This similarity is a fact and a very remarkable one too. Had it not been for this similarity homœopathy would have been as hopelessly at sea as the system which it has dared to supersede and succeeded in doing so. The similarity is so close as to have led Claude Bernard to declare: "There exists so remarkable an analogy between the symptoms of legitimate diseases, and the disorders which result from the introduction of toxic agents into the economy, that the effects of poisons may, up to a certain point, be considered as the most perfect specimen of morbid actions, which can possibly be selected as a type."

The only other relationship that can possibly exist between the two sets of symptoms is opposition or contrariety. It is this latter which forms the foundation of the system of therapeutics of the old school. The great defect of this system depends upon the fact that very few symptoms of disease find their opposites in the symptoms of single drugs, and hence the necessity of the use of a combination of drugs to combat a single disease, and when this does not suffice, a number of other drugs have to be added or had recourse to which have no sort of relationship with the disease. This has necessarily led to the greater play of fancy and imagination in the selection of remedies than of reason and the observant faculties. And this accounts for the endless divergencies of opinion among medical men which has become proverbial.

The law of similars was arrived at by induction from a sufficient number of instances to warrant its being made the basis of a provisional rule of practice. This rule has met with success in almost every instance in which it has been applied, and has thus been confirmatory of the law. The law is thus established as a law of nature, receiving support, as every natural law does, from

every additional case in which it is verified. It has brought order and unity and uniformity in the healing art where confusion and perplexing multiplicity prevailed. It has not only armed the practitioners of the art with instruments of precision against known and familiar diseases, but has conferred upon them a power of prevision to deal with unexpected contingencies which it could not do if it itself had not been a real law based upon the unerring and eternal relationship of cause and effect. This has been well seen in the case of the disease under consideration which, as has been shown above, has proved such a stumbling block to the majority of the profession who are ignorant of the law, or perversely ignore its existence and refuse to avail themselves of its advantages.

Suggestions and Successful Trials of Homœopathic Remedies in Cholera by Hahnemann's Followers.

When the cholera threatened Europe in 1830, Hahnemann's followers were busy in finding its analogue in the drugs that had been proved. Dr. J. A. Schubert, of Leipzic, published a work in that year on the *Treatment and Prevention of Cholera*, in which he recommended its treatment by *Veratrum*, *Ipecacuanha*, *Arsenic* and *Chamomilla*, and when the inflammatory character was predominant, by *Aconite*, on homœopathic principles. He likewise recommended *Veratrum*, *Ipecacuanha* and *Arsenic*, as prophylactics in the disease. Dr. Preu, of Nuremberg, shortly after published a paper in the *Archiv*, in which he showed "the close resemblance of the symptoms of Asiatic Cholera with those produced by *Arsenic* and *Veratrum*. "How just," says Dr. Dudgeon, "Dr. Schubert's notions respecting the proper remedies to be used in the disease, before he had an opportunity of treating a single case, the success attending their subsequent employment fully demonstrated." We learn also from Dr. Dudgeon that Dr. Peterson, of Pensa, and Dr. Arnold of Kasan, both in Russia, "were the first to test the efficacy of the system in the real Asiatic Cholera," and met with the most encouraging success. Dr. Peterson used *Ipecac* 20th, *Chamomilla* and *Arsenicum* 30th, and out of 68 cases that he treated only he lost 14.

Hahnemann's Own Suggestions.

These suggestions were offered and these trials were made fore the Founder of Homœopathy wrote his famous letter,

dated the 10th September 1831, from Cœthen, to the editors of the *Archiv für homœ. Heilkunst*, giving directions for the *Treatment and Prevention of the Asiatic Cholera.* In this letter were announced "the curative virtues of *Camphor*, in doses so large, and at intervals so short," says Dr. Dudgeon, "as completely to stagger those of his disciples who could see in Homœopathy nothing but a system of decillionths, and were unable to separate in their own minds the principle of *similia similibus*, from the doctrine of infinitesimal doses." Camphor is recommended only for the first stage of the disease, in which it is not only the most useful but really an infallible remedy. (After the first stage is passed "*Camphor* is no longer serviceable,") and its administration "must only be continued so long as *decided* benefit is observable (which with a remedy of such rapid action as camphor manifests itself within a quarter of an hour). If in such cases decided benefit is not soon perceived, then no time must be lost in administering the remedy of the second stage." This is copper, prepared from the pure metal according to the directions given by him in the *Chronic Diseases*, and "of which the patient is to get one or two globules every hour or every half hour," "until the vomiting and purging diminish, and warmth and rest are restored. But nothing else at all must be given beside; no other medicine, no herb tea, no baths, no blisters, no fumigation, no venesection, &c., otherwise the remedy will be of no avail. Similar good effects result from the administration of as small a portion of white hellebore (*Veratrum album*); but the preparation of copper is much to be preferred, and is more serviceable, and sometimes a single dose is sufficient, which is allowed to act without a second being given, as long as the patient's state goes on improving." For the typhoid stage we are told, "*Bryonia*, alternately with *Rhus tox.*, proves of eminent service."

In a note he adds: "If the dear and scarce (frequently falsified) cajeput oil be actually so serviceable in the Asiatic Cholera that out of ten scarcely one died, it must owe this quality to the camphor-like property (it may almost be regarded as a fluid camphor) and to the circumstance, that from the copper vessel in which it is imported from the East Indies, it takes up some portion of copper, and hence, in its unpurified state, it is of a

bluish-green color. It has moreover been found in Hungary, that those who wore next the skin of their body a plate of copper were exempt from infection; as trustworthy intelligence from that country informs me." This does not seem to be consistent with what he says in the last paragraph of his letter, that when cuprum is being taken as a prophylactic, "the vapor of camphor must be avoided, as it suspends the action of the copper." If Camphor suspends the action of Copper how is it that a combination of Camphor and Copper in Cajeput oil was so efficacious in cholera?

This was all that Hahnemann advised about the treatment of cholera. The remedies recommended by him, it will be seen, are, with one exception, different from those which his followers previous to the publication of his letter, had used with considerable success. The exception is *Veratrum*. The two other remedies are new and were not thought of by his disciples. These are *Camphor* and *Cuprum*. Camphor, with its large doses and frequent repetition, was a startling discovery. How he came to it is not clear from the recorded documents we have before us. At the very beginning of the Essay on the *Cure and Prevention of the Asiatic Cholera*, he says: "A receipt has been given to the world, which proved so efficacious in Dünaburg in the Asiatic Cholera, that of ten patients but one died. The chief ingredient is *Camphor* which is in ten times the proportion of the other ingredients. But not a tenth—nay, not one in a hundred of the patients would have died had the other ingredients, which were but injurious and obstructing, and the venesection been left out, and the *Camphor* been given alone and always at the *very commencement of the disease, for it is only when given alone, and at the first invasion of the disease, that it is so marvellously useful.*"

Whether the recommendation of Camphor in the very first stage of the disease was suggested by the recipe spoken of above, it is impossible now even to surmise, as he himself says nothing about it. In his letter to Stapf, dated Aug. 5, 1831, he writes: "As long as the Allopaths represented to us (without giving any trustworthy picture of the disease) that cholera is a compound of vomiting and purging, so long we poor Homœopaths at a distance had to regard *Veratrum* and *Arsenic* as the specific

remedies for it. But the faithful description by a Homœopath has taught us that its character is quite different. It is a tonic spasmodic diathesis of all the systems, spheres and tissues of the organism; which only towards the end of life passes into convulsions and paralysis, and then there follows watery vomiting and diarrhœa, and that only in some cases; nothing of the sort is to be seen in most cases, but only rapid death. Such being the case neither *Veratrum* nor *Arsenic* can be of much use. Schreter writes me from Lemberg, when he arrived on the 15th July, that he was able to do some, but not much good with *Veratrum*, and when it did no good then *Camphor* was successful (when he wrote he had just received my essay on *Camphor*)." Are we to suppose from what he says here that he recommended Camphor in the first stage because the disease is not a compound of vomiting and purging as the Allopaths had represented it, but because it was "a tonic, spasmodic diathesis of all the systems, spheres and tissues of the organism"? Hahnemann himself is not explicit on the point. In this letter he speaks of having enclosed an explanation of why he had recommended large doses of Camphor, which Stapf is said to have published in the *Archiv*. But unfortunately no body has thought of giving the exact words of the "explanation." Dr. Bradford, Hahnemann's biographer, contents himself with saying: "Hahnemann says that the reason he gave *Camphor* in large doses is *that the effect* to be produced is an Allopathic and not a Homœopathic one. A palliative action must be at once produced or the patient will die before the Homœopathic medicine has time to act." If this was really the explanation Hahnemann gave, it was a strange one and does not accord with what he says in his Essay on the subject and in his letter to Stapf, part of which we have quoted from Dr. Bradford himself. For the sake of Homœopathy and of its Founder we should have the exact words of the explanation, nothing short of which will satisfy us as to the correctness of Dr. Bradford's representation of it.

It is true this was not the first occasion Hahnemann recommended large doses of Camphor. In the article on the drug in the *Materia Medica Pura*, vol. iv, 2nd edit., 1825, where he speaks of its action as very puzzling and difficult to determine and its curative action as equally puzzling and wonderful, he does not he-

sitate to recommend it in influenza in frequent but ever-increasing doses, "only as a palliative certainly but an invaluable palliative." "It does not shorten the duration of the disease, but renders it much milder, and hence it conducts the disease innocuously to its termination." So that he did not neglect the administration of a palliative when urgently needed and calculated to do good. Might he not have been influenced by some such consideration when he recommended the drug in cholera in large and frequently repeated doses? And in this he was certainly not inconsistent with himself. If he had said so when he made the recommendation, no doubts and misgivings could possibly have arisen in the minds of his disciples. It would have only shown that when the life of mankind was concerned he could rise above his own dogmatism in the matter of the dose.

It is further to be noted that if what Schreter wrote to Hahnemann from Lemberg was fact, namely, that *Camphor* was successful after *Veratrum* had failed, then it must be admitted, which Hahnemann has not done, that Camphor was useful not only in the first, but in the second stage also, for it is more than probable that *Veratrum* must have been given in this and not in the very first stage as understood by Hahnemann.

However arrived at, the recommendation of Camphor in cholera, especially in its first stage, constitutes a most important discovery and has given us a priceless remedy for the disease, though it is not an infallible remedy, as we shall see, in even the very first stage in every epidemic. It is a remedy which, as Hahnemann would say, has no substitute, nor can it, we must say, be a substitute for others. It has its own sphere of action and is "marvellously useful" in that sphere, but beyond that it is useless and often injurious.

Treatment of the Different Stages of Cholera.

For purposes of treatment the disease may with advantage be considered as consisting of the following stages:—

I.—The First is the stage of Premonitory Symptoms.

II.—The Second is the stage of Full Development.

III.—The Third is the stage of Collapse.

IV.—The Fourth is the stage of Reaction.

V.—The Fifth is the stage of Sequelæ.

In the most virulent forms, the first stage may merge so rapid-

ly into the second as not to be distinguishable. In the majority of cases, however, it is present, and should be availed of to cut short the disease. In the milder varieties the fifth stage may be wanting, the fourth or the stage of reaction being followed by a return to health. The most dangerous are the third and the fifth stages, or the stages of collapse and of sequelæ. Death takes place in either of these stages.

I.—**The Stage of Premonitary Symptoms,** we should consider to cease with the first appearance of the rice-water stool. It is of variable duration and severity. It generally occupies only a few hours, but it may occupy even a few days. And from being a slight malaise barely distinguishable from health, it may exhibit profound prostration hardly distinguishable from the actual disease itself. About the end of it there is purging, or purging with vomiting or at least nausea; but it does not necessarily commence with these symptoms. It is, however, essentially characterized by disturbance of the digestive organs. Often at the beginning there is some constipation, and almost always an impaired appetite. However produced, these ought to serve as warnings, especially in seasons when the disease is raging. But unfortunately these warnings are too often disregarded and the individual goes on with his usual vocation, and what is worse, his usual diet. It is not simply the quality but the quantity as well of the food that very often disposes to attacks of cholera. The quantity being small, even bad quality of food may not be seriously injurious. As the most fertile cause of the disease we may mention the use, of course excessive, of raw, acid, or sub-acid fruits, of ripe fruits in a state of decomposition. In this country new rice is a very frequent predisposing, and sometimes exciting, cause of the disease, specially among the poorer classes. Next in order we should mention greasy food, ill-cooked food, fried food, food not sufficiently salted, or too much salted. Late hours, and excessive indulgence in alcoholic drinks, especially the fermented beverages, do very frequently predispose to the disease.

The treatment of the disease in the preliminary stage is perhaps the most difficult of all. On this treatment the subsequent character and course of the disease will in a great measure depend. We do not mean to say that the disease can in every

instance altogether be averted; but our firm conviction is that it can be in a large number of cases, and that the mortality can be greatly lessened.

The cases are very few in which we have not been able to trace the disease to some influence over which the individual had control; and in the majority of instances we could detect some error in diet previous to the attack. We do not question the general nature of the cause which predisposes to cholera, but we doubt if in any instance the immediate exciting cause is not some deviation from the ordinary course of living. We draw attention to this fact from a belief of its importance. People should be made acquainted with the predisposing and exciting causes of the disease, in order that they may avoid those which can be avoided. Besides, in homœopathic treatment a knowledge of these causes is essential. In fact, the treatment of the preliminary stage should be chiefly directed to counteract their deleterious influence upon the constitution.

The first anxiety of the physician should, therefore, be to inquire into the previous history of the patient, in order to ascertain the determining cause. This should never be neglected. The patient and his friends and relations will almost always tell us that nothing unusual has preceded the attack; and we may be charged with idle, if not impertinent curiosity, for making such minute inquiries. But we should be perfectly heedless of these remarks, and we should never be satisfied till we have succeeded in discovering the antecedent circumstances calculated to disturb the digestive functions or at least exhaust the nervous energies. Treatment directed according to these circumstances will be more successful.

The object of treatment in the preliminary stage is to counteract the general depression of the system and to remove the irritable condition of the digestive organs. The great drawback of the old school treatment of cholera, as in fact, of all disease, is that it does not attack the very seat of the disease; and consequently the drugs being used in massive doses produce other effects than simply removing the symptoms they are prescribed for. We can avoid this by a *judicious* homœopathic treatment. We say *judicious* advisedly, because our conviction is that even homœopathic treatment when not so will prove injuri-

ous. We submit, it is a mischievous error to think that homœopathic remedies do no harm if they do no good. Our experience has proved the very reverse. Indeed, common sense suggests that if potent for good when rightly administered, they must be potent for evil when wrongly administered; and so we find them to be. The injurious effects of homœopathic medicines often show themselves not merely in the shape of aggravations; but also in the development of other morbid conditions not present in the case. Hence we cannot too strongly deprecate what is called domestic physicking, when scientific medical aid is available.

In this stage the following remedies have been found useful:—

Aconitum, when there is nausea with sweat, at times preceding at times following the diarrhœa; when with the white stools there is red urine; when with a feeling as if only flatus were passing, there is unexpected discharge of thin fæces; when the diarrhœa consists of watery stools; when the stools are green, or black and very offensive, or clay-colored; when the stools and urine are involuntary. When the hypogastrium on being touched feels painful and sensitive; when the weakness of the bowels has resulted from abuse of purgatives; when there is a sensation as of a warm liquid coming out of the anus. ACONITE is exceedingly useful when the alimentary irritation has culminated in acute congestion of the mucous membrane. Under ACONITE the moral symptoms are worth noting: there is excessive restlessness, anxiety, dread of some accident happening, fear of approaching death, disinclination for mental labor. Under ACONITE there is either great thirst, which is often unquenchable, or there is coolness and dryness of the mouth *without* thirst.

Arsenicum or China, when the disorder of the bowels can be traced to eating fruits. In both the painless stools are watery, profuse, and offensive. In both they may be corrosive. In both the aggravation is at night, in ARSENIC chiefly after midnight. We prefer ARSENIC when there is disturbance of the stomach as well as of the lower bowels, especially where there is burning of the stomach; when there is violent thirst, drinking often and small quantities at a time or large quantities; when there is aggravation from cold food, ice-water or ice-cream. We would prefer CHINA when with the stools the undigested foods make

their appearance, and there is tympanites; when we have to suspect previous loss of vital fluids, such as semen or blood; when there is ringing in the ears. If along with the other symptoms there is *dread of Cholera*, ARSENICUM is the remedy.

Pulsatilla, when indulgence in fatty or greasy food has been the cause of the diarrhœa; when the diarrhœa has followed an attack of measles; when the diarrhœa is chiefly nocturnal; when the stools look like stirred eggs; when the stools are first green, then consist chiefly of mucus. PULS. is especially adapted for females and persons of effeminate nature and reserved disposition; with weeping mood, and actually weep when relating their symptoms. The irresistible desire for fresh air and thirstlessness are characteristics of PULSATILLA.

Nux vomica, when intemperate drinking with or without the use of rich food has preceded the attack, and when there is much acidity of the stomach, especially if the diarrhœa has followed a constipated condition of the bowels. NUX V. is useful in diarrhœa when it occurs early in the morning, and after dinner; when the stools are fœtid and a-bilious; when there is ineffectual urging to stool. It is adapted for persons of irritable disposition.

Phosphorus or **Phosphoric Acid**, when the disease has supervened upon a chronic, especially painless diarrhœa. We prefer PHOSPHORUS when there is a good deal of heat in the abdomen, or *coldness and a sense of coldness* therein; when there is oozing from the constantly open anus; again in the case of old people with fatty degeneration of the liver, and other important organs, we would give preference to PHOSPHORUS. We should use PHOSPHORIC ACID when we have reason to suspect there has been much sexual intemperance preceding the attack. The PHOSPHORUS patient is lean and slender; the PHOSPHORIC ACID patient is the young person who has grown too rapidly. PHOSPHORUS has aggravation from lying on the *left* side, PHOSPHORIC ACID from lying on the *right*. Both have aggravation after eating, but PHOSPHORUS has aggravation from *warm* food.

Carbo. Veg., if the patient had been exposed to great or prolonged heat either of the sun or of the fire. It is very useful for cooks, blacksmiths, masons, and for all those whose occupation exposes them to the sun or the fire. Sometimes cholera is ushered in by hæmorrhage from the bowels; in these cases we

have found CARBO v. eminently serviceable. CARBO is useful in diarrhœa associated with great development of flatulence. It is serviceable also when the stools are papescent, profuse, and pink-colored, not quite bloody. It may be doubted whether cases presenting such symptoms are true cases of cholera, but their occurrence during epidemic visitations of cholera, and their other symptoms corresponding with those of cholera, can leave no doubt in the mind as to their real character. Reduction of the temperature of the body as manifested by the coldness of the surface, of the tongue, and even of the breath is a marked symptom of CARBO v.

Chamomilla or **Colocynth**, when the disease would seem to have arisen from fits of anger or chagrin or both. We would prefer COLOCYNTH if anger and chagrin had been combined in producing the result. The CHAMOMILLA patient is never tired of complaining, he cannot cease talking about old vexatious things; whereas the COLOCYNTH patient is not inclined to talk though he may suffer the greatest vexation. Both have sour, corrosive, offensive watery stools; those of CHAMOMILLA are *hot*, those of COLOCYNTH are *frothy*. In CHAMOMILLA there is relief from the abdominal pains after stool, whereas in COLOCYNTH the gripes and colic are worse after stool and are very severe, or are only temporarily relieved by it, not ceasing till a number have been passed.

Ipecacuanha, when the tongue is coated white, when there is continual nausea with or without vomiting, when the stomach still continues loaded with heavy indigestible food, when the diarrhœa is accompanied with pain, griping, tenesmus, and when the stools are grass-green or lemon-colored, or have the appearance of being fermented, or when they are fœtid or covered with bloody mucus. IPECACUANHA and CHAMOMILLA are especially serviceable in the cholerine of children, the latter being particularly indicated when the diarrhœa is dependent upon teething.

Aloe and **Sulphur** are two remedies which have done excellent service in the preliminary stage. Both have early morning stool, the urging being so great as to drive one out of bed. Both have semi-liquid, and even watery stools, which are hot (scalding-hot in the case of SULPHUR); in both undigested matter appear in the stools. The distinctive characteristics are: The stools of ALOE are *gushing*; involuntary when passing flatus or urine;

the stool passes without his needing to make any exertion, it falls, as it were, out of the rectum. The stools of SULPHUR are *sour; corrosive;* involuntary when sudden, not when passing urine or flatus, but when only imagining that flatus was passing. Excoriation is a characteristic of SULPHUR, urine is excoriating, tears are excoriating. The diarrhœaic stools of SULPHUR are frothy which is not the case with ALOE. SULPHUR has prolapsus ani and recti during and after stool, a symptom wanting in ALOE.

Podophyllum is a precious remedy for the first stage, and when properly selected it has also averted the full development of the disease. It has, like ALOE and SULPHUR, hot, watery evacuations. It has diarrhœa, acute and chronic, early in the morning, which continues through the forenoon, after which it has a natural stool in the evening. It has, like SULPHUR, frothy stools, and prolapsi ani and recti, recent or chronic. It is suitable in cholera infantum, especially during dentition, thus vying with CHAMOMILLA. It has not only hot stools, but hot vomiting which will often differentiate it from other remedies, except PHOSPHORUS. It is generally characterized by thirstlessness, but may have violent thirst. It acts better in cases where the former is the predominant symptom. It has cramps in the feet, legs (calves), and thighs.

Colchicum has frequent, profuse watery evacuations, generally yellowish, very often painless and sometimes involuntary and without any sensation to the patient; and thus vies with **Podophyllum** as an excellent remedy in the preliminary stage. But the difference between the two consists in the stools of the former being less gushing, and containing large quantities of small white shreddy particles, mixed with white membrane-looking matter; in the time of aggravation which is evening and night with the former and morning and forenoon with the former; in the stools not being hot as in the latter; in the greater predominance of nausea and thirst and loss of appetite with the former than with the latter. It should be remarked that the stools of COLCHICUM may be excoriating and sour-smelling which is not the case with PODOPHYLLUM.

Cantharis has been used with success even in this stage. Its range of applicability is of course very limited, but within

this limit it acts marvellously. It has violent diarrhœa, with intolerable burning at the anus; the diarrhœaic stools are frothy, watery, copious, corrosive. The appearance in the stools of shreds like scrapings of the intestines is a characteristic of CANTHARIS. If with this there is frequent, ineffectual desire to urinate, we have a good indication for the drug, and its selection in such cases has not disappointed. It has other symptoms which, as we shall see, eminently qualify it as a remedy in the stages of full development and of collapse.

Iris versicolor has diarrhœaic stools of all degrees of consistency from soft papescent to watery like that of cholera. The color of the stools may be all shades of yellow and green, even to dark and blackish. The quantity is profuse, often running out in continuous stream. The frequency is very great. The stools may contain undigested matter and are aggravated after eating (breakfast and supper). A great characteristic is that they are almost always attended by great burning of the anus and rectum which feel as though they were on fire. This burning very often extends throughout the whole length of the alimentary canal, from the mouth to the anus. The burning of the anus continues after stool, though it diminishes after each stool. The stools are generally preceded and accompanied by rumbling and distressed pains in the intestines. It has violent vomiting, the vomited stuff consisting of the ingesta, of bile, of an intensely sour liquid which excoriates the throat. There is from the very first extreme exhaustion and debility, with cold limbs and body. Hence it is likely to be useful in the first stage. It seems to be doubtful, if it will prove equally useful in the stage of full development, for the evacuations, notwithstanding that they may be and are often watery, they are always more or less bilious and never rice-water like. Nevertheless if the characteristic symptoms correspond, we should not hesitate to give it a trial. In animals poisoned by it the pancreas was found to be highly congested, so that this circumstance is one of the causes of the diarrhœa produced by it, and should be borne in mind.

Camphor, as we have seen, was recommended by Hahnemann in massive doses for the very first stage of cholera. What did he mean by this stage? Here we have his own words—"Where the cholera first appears it usually comes on in the

commencenment in its first stage (with tonic spasmodic character); the strength of the patient suddenly sinks, he cannot stand upright, his expression is altered, the eyes sunk in, the face bluish and icy cold, as also the hands, with coldness of the rest of the body; hopeless discouragement and anxiety, with dread of suffocation, is visible in his looks; half-stupified and insensible, he moans or cries in a hollow, hoarse tone of voice, without making any distinct complaints, except when asked; burning in the stomach and gullet, and cramp-like pain in the calves and other muscles; on touching the precordial region, he cries out; *he has no thirst, no sickness, no vomiting or purging.* In the first stage CAMPHOR gives rapid relief but the patient's friends must themselves employ it, as this stage soon ends either in death or in the second stage, which is more difficult to be cured, and *not* with Camphor."

Unless we have Hahnemann's explanation, in his own words, of the frequent and large doses of Camphor recommended by him in the very first stage of cholera, we cannot know on what principle he made the recommendation, whether on the principle of similars or of contraries, even though we have Dr. Bradford's assurance that he did it on the latter principle. But whatever doubt there may be on this point, so far as the pathogenetic action of Camphor is concerned, there can be no doubt that he recommended it also for its germicidal action, as the following extract from his *Appeal to Thinking Philanthropists respecting the Mode of Propagation of the Asiatic Cholera,* will show:—

"If physicians would but take warning, and, rendered uninfectable by taking a few drops of camphorated spirit, approach (ever so quickly) the cholera patient, in order to treat him at the commencement of his sickening with this medicine (*pure, unadulterated camphorated spirit*) which alone is efficacious, and which most certainly destroys the miasm about the patient, by giving him, as I have taught, every five minutes one drop of it and in the interval assiduously rubbing him on the head, neck, chest, and abdomen with the same medicine poured into the hollow of the hand, until all his giddy faint powerlessness, his suffocative anxiety, and the icy-coldness of his body has disappeared, and given place to reviving animation, tranquillity of mind, and complete return of the vital warmth—if they would

but do this, then every patient would not only be *infallibly* restored within a couple of hours (as the most undeniable facts and instances prove), but by the cure of the disease with pure camphor, they would at the same time eradicate and annihilate the miasm (that probably consists of innumerable, invisible living beings) in and about the patient, about themselves, even in the clothes, the linen, the bed of the patient (for these all would be penetrated by the vapour of the camphor if it were employed in this way); in the very furniture and walls of the apartment also, and they themselves (the physicians and nurses) would then carry off none of the contagious principle with them, and would no longer infect persons throughout the town."

We have given this long extract in order to show that one of the positive reasons of Hahnemann's recommendation of Camphor was, as he states, its power of eradicating and annihilating the miasm of cholera which, he shrewdly suspects, "probably consists of innumerable, invisible living beings." How his penetrating genius anticipated the discoveries of modern bacteriologists! We have no doubt that if he had been living to this day, his large and comprehensive mind would have welcomed these discoveries and allowed them to have their due weight in modifying some of his views on disease and its treatment. It is a pity that none of our bacteriologists have thought of determining the action of Camphor on the life of the microbe, especially of that of cholera. It is not too late yet to do it.

We have given Hahnemann's indications of Camphor in his own words, inasmuch as there has prevailed great diversity of opinion amongst his followers regarding the use and efficacy of the drug since his time. While some, such as Dr. Hempel, have gone so far as to altogether deny the homœopathicity of camphor to cholera in any stage; others, such as Dr. Rocco Rubini, of Naples, have gone as far in the opposite direction,—and this is far beyond the Master—as to assert that Camphor alone present the true similimum of cholera in all its stages. According to Dr. Rubini cholera is a disease of an exceedingly acute and evanescent character, and therefore must be met by a remedy whose action must be analogously powerful and evanescent, which, in his opinion, is no other than Camphor. We do not believe that cholera is in every case a

very transient disease. Even when left to itself, it continues for many days and even many weeks, of course not in the shape in which it first manifests itself, but in the form of the sequelæ which it gives rise to. We do not question the accuracy of Dr. Rubini's statement, that of 592 cases treated with Camphor alone not one ended fatally. Dr. Rubini himself admits that he got to treat his own cases in the very first stage and that very few of the whole number were especially severe (in the Royal Alms-house only 15 in 200). This cannot justify the sweeping conclusion that all the stages of the disease will yield to Camphor. Hahnemann is more correct, though not quite so, in limiting the use of the drug to the stage when no sickness, no purging or vomiting have yet taken place. Diarrhœa, it is true, must be a very rare symptom of camphor; the *involuntary diarrhœa* noticed by Jahr must have been the effect of an extreme dose. Again the nausea and vomiting are not frequent effects of camphor; in all the reported cases of poisoning these do not figure at all. But these symptoms do now and then appear. I observed them lately in a child who had taken a large quantity of the drug. Two cases reported by Dr. Bhuban Mohan Sircar, in the *Calcutta Journal of Medicine* for April 1869, show that Camphor does produce decided choleraic symptoms in young children,* and, if in young children, why not in adults in suitable doses? From these facts it must be evident that Camphor *is* in homœopathic rapport to cholera.

At the time Hahnemann wrote his now famous directions for the treatment of cholera, the disease was perfectly unknown to him, it was looming in the far distant, he only knew of it from report, and his knowledge of Camphor was imperfect too.

* The Cases are the following :—

Case 1.—A child aged 18 months, accidentally got a piece of purified camphor (cake) weighing nearly a drachm and ate it all. About an hour after, violent purging and vomiting set in, and the child became collapsed in 4 or 5 hours. At first I thought it was a case of genuine cholera, but on enquiry I learnt the true cause of the malady. Restlessness, intolerable thirst, and sinking of the eyes, coldness of the body, copious rice water stools, frequent vomiting, feeble pulse, in fact all the symptoms of cholera supervened. The child's life was in danger but fortunately it rallied by judicious allopathic treatment.

Case 2.—A boy aged 3 years, suffered from purging and vomiting after taking some camphor, (quantity not known); no other serious symptoms supervened, but the action of camphor was well marked.

As far as his knowledge of the disease and of the drug went, his recommendations for its treatment bear the impress of genius, and unmistakably point to the truthfulness of the law of healing discovered by him. Used according to the indications pointed out by him, Camphor will give "rapid relief," and patients will be restored to health, "as if by magic." But the use of Camphor need not be restricted to cases where purging and vomiting and even sickness have not yet commenced. If Hahnemann had been acquainted with the power of Camphor to produce copious rice-water stool and vomiting he would certainly not have made the restriction. With our knowledge of that capability we shall not be justified in following our Master to the very letter. Abundant experience has testified to the usefulness of Camphor in cholera when both stools and vomiting have commenced; and indeed the miasmatic theory of the genesis of the disease, whether the miasm consists in living germs as modern bacteriology would seem to show, in many cases, or in deleterious gases or some fermentible substances as sometimes seem but too probable, does point to Camphor as the best remedy to begin with, preliminary to other remedies that may be required corresponding to symptoms developed in the subsequent course of the disease.

Camphor has been shown to be not equally efficacious in all epidemics. This only points to the multiple origin of the disease. Camphor should be desisted from when it invariably aggravates the existing vomiting or when it brings on vomiting after each dose, and when vomiting aggravates the collapse. In such cases a milder dose, such as a few globules moistened with the tincture or even with a dilution, 2nd or 3rd decimal, may be tried. We have had successful experience with globules moistened with the tincture, representing not more than a twentieth, or at the highest a tenth of a drop. We have as yet had no experience with the dilutions, but we are inclined to think that, as with other drugs, where the mother tincture fails, the dilutions may succeed.

The homœopathic physician, when called upon to treat a case in which allopathic drugs have been fruitlessly employed, would do well to preface his treatment by the exhibition of Camphor, as an antidote, but he should be content with a dose or two only, if no improvement follows; but he should not go on with it unless

there is decided and continuous improvement from its administration. Some practitioners, believing with Dr. Rubini that it is the remedy for all stages of the disease, continue its use unmindful of the evil results that follow. This is a practice which we cannot too strongly condemn as reckless.

II.—**The Second Stage or Full Development** of the disease commences with the establishment of the rice-water stool and vomiting. In this stage the prostration becomes serious, indicated by an exceedingly feeble pulse, sunken and pinched features, hoarse voice, cold, clammy skin. The urine becomes totally suppressed.

These are the general features of this stage, and constant in all the forms met with. Distinctive features rise, as we have said above, from the preponderance or unusual development of some one or more of the symptoms. Thus:

In the *diarrhœaic* variety we have the downward evacuations from the bowels extremely frequent and profuse.

In the *gastric* variety we have the irritability of the stomach, evidenced by the nausea, continual retching and vomiting, as the most distressing symptom.

In the *gastro-enteric* variety we have both vomiting and purging in an equally distressing degree.

In the *spasmodic* variety, we have the spasms in a most alarming aspect;—first commencing in the lower extremities, they next manifest themselves in the upper and are then found in the muscles of the abdomen and chest, threatening suffocation and syncope, by invading the diaphragm and the muscular structure of the heart. In this variety the spasms are generally out of proportion to the evacuations, though in some instances they may appear to be in direct ratio to them.

In the *inflammatory* variety we have a bounding, full but easily compressible pulse, heat of abdomen, and sometimes of the general surface.

In what is called the *acute* variety the prostration is quite out of proportion to the evacuations, the countenance at once becomes livid or blue, the pulse rapidly fails, the voice becomes a whisper, the perspiration becomes profuse and clammy and seems to take the place of the evacuations.

In the *dry* variety this stage seems to be wanting, or rather is followed at once by the next stage or collapse, before being manifest outwardly.

The chief remedies in this stage are :

1. **Veratrum album,**
2. **Arsenicum,**
3. **Cuprum,**
4. **Secale cornutum,**
5. **Ricinus,**
6. **Aconitum,**
7. **Camphor.**

The differential indications of these drugs are of course to be gathered from their pathogeneses. In general terms we can only say here that in the diarrhœaic variety we should prefer VERATRUM and RICINUS ; in the gastric variety, ARSENICUM ; in the gastro-enteric variety, ARSENICUM, or ARSENICUM in alternation with VERATRUM or RICINUS, or VERATRUM or RICINUS alone ; in the spasmodic variety, CUPRUM and SECALE ; in the dry and acute varieties, CAMPHOR, and after it ARSENICUM ; in the inflammatory variety, ACONITUM.

Veratrum and **Arsenicum** are the two great remedies upon which homœopathic physicians chiefly rely when the cholera is fully developed, always assuming that CAMPHOR had been administered previously and has failed.

In the *Materia Medica Pura*, Vol. iii, 2nd edition (1825), Hahnemann gives the following as the gastro-enteric symptoms of **Veratrum alb.**, mostly from old school authorities : "Great nausea before the vomiting. Vomiting of food. Two attacks of vomiting, at each attack vomiting three or four times, in the intervals between the vomiting, persistent nausea, vomited matter sour. Vomiting first of bile and slime, then black bile, lastly blood. Violent, enormous vomiting. Each time before vomiting shivering all over the body. Excessive evacuations ; frequent painful and violent diarrhœa ; diarrhœa with profuse perspiration ; diarrhœa with pains during and after stool ; violent bloody diarrhœa." In Allen's *Encyclopædia* we have the following additional symptoms : "Excessive thirst during the perspiration ; much thirst for cold drinks, great thirst with hunger ; vomiting and diarrhœa as many as ten times, with pale sunken face,

covered with cold sweat; excessive, copious evacuations; sudden involuntary watery evacuations." These gastro-enteric symptoms, with the other symptoms which VERATRUM can produce,—namely, prostration and weariness of the whole body, coldness and sensation of coldness over whole body, blue nails from coldness, spasmodic drawing of the limbs, cramps in the calves, pulse very slow, almost or completely lost, general spasms,—form a close analogy with those of cholera.

Arsenicum has the following gastro-enteric symptoms in the *Materia Medica Pura* and the *Chronic Diseases*: "Unquenchable thirst, drinking affords no relief, drinks often but little at a time. Or, uncommon thirst, drinks much cold water every ten minutes from morning till evening, not at night. Vomiting immediately after meal, without nausea; vomiting of the ingesta; excessive vomiting with great effort, of drinks, yellowish-green mucus and water, with persistent bitter taste in the mouth. When vomiting ceases, frequent, very watery diarrhœaic stools set in; violent continual vomiting, with diarrhœa; during vomiting severe internal burning heat and thirst; frequent vomiting with *dread of death*. Yellow, watery, scanty diarrhœaic stools, with subsequent tenesmus as if more would pass; with violent burning in anus; black, fluid stool, burning in the anus like fire, often much restlessness and pain in abdomen." The following additional symptoms are taken from Allen's *Encyclopædia*: "Vomiting every time after drinking, even water is immediately thrown off; sometimes the vomiting is relieved by water. Diarrhœa, copious, involuntary and painless." ARSENICUM produces other symptoms which with those already mentioned strongly point to it as a true homœopathic remedy in cholera. These are: "profound collapse, not necessarily connected with the alvine evacuations, with quick, weak, irregular pulse, pulse scarcely or not at all perceptible; absence of pulse being characterized by frequent, irritated beating of the heart; palpitation and tremulous weakness after stool; frequent oppressive shortness of breath in every position of the body, causing anxiety; cold clammy sweat over whole body; cold as a corpse; restlessness and anxiety, throwing himself from side to side; excessive sinking from slightest paroxysm of pain."

It is usual to give VERATRUM first and then to follow it up

with ARSENICUM if it fails to arrest the progress of the disease. It is not easy to determine which drug is to be used in preference. Both the drugs have a great deal in common, especially in reference to those symptoms which analogise with those of cholera. There seems, however, to be this difference between them, that the prostration of VERATRUM seems to be in direct proportion to the alvine evacuations, whereas the prostration of ARSENICUM is more profound, is a destructive effect of the drug upon the very innermost recesses of life. The discharges of VERATRUM both by purging and vomiting, are copious and free, whereas those of ARSENICUM are scanty, and attended with distressing urging and retching. Both the drugs are indicated when there is violent, unquenchable, burning thirst, especially for cold drinks; but VERATRUM should be given in cases where the patient can take large draughts of water without any inconvenience, and ARSENICUM should only be given when the patient can swallow but little at a time, and that little aggravates all the symptoms, especially the vomiting and the purging; though it must not be forgotten that ARSENICUM has rarely thirst in which the patient can drink large quantities of water. Besides, ARSENICUM is a powerful antidote of various miasmata, which VERATRUM is not. VERATRUM therefore would be more suitable in sporadic cases, and in the mild cases during epidemic visitations; whereas ARSENICUM would be indispensable in times of epidemic virulence, and in all cases in which prostration precedes the outbreak of the disease, and has probably resulted from miasmatic infection. In such cases it would in our opinion be simple waste of time to withhold the administration of ARSENICUM till VERATRUM has failed.

It is not a little singular that Hahnemann, to whom we owe such graphic description of arsenical poisoning, should not only not have included ARSENIC in his enumeration of remedies for cholera, but should have gone so far as to say that it could not be of much use in the disease. Yet scarcely has any remedy vindicated the reputation of homœopathy in this dreadful disease so much as ARSENIC. Generally the most deadly cases of cholera resemble acute arsenical poisoning, and indeed, in not a few cases was the latter mistaken for the genuine disease itself. Some years ago, as we have already said, a druggist in this

city was treated by able physicians for cholera, and it was discovered after his death that the patient had taken ARSENIC to commit suicide. Indeed, poisoning with ARSENIC in so many cases simulate the symptoms of cholera that medical jurists have begun to form a class of such cases by itself. But just as it is not every case of arsenical poisoning which presents symptoms of cholera, so it is not every case of cholera which has symptoms resembling those of arsenic-cholera. Hence the necessity of extreme caution and discrimination in the use of ARSENIC in the treatment of cholera. But a hard experience compels us to confess that in spite of the utmost caution and discrimination the selection of the drug may be still wide of the mark, showing how far we are still from comprehending both the disease and the remedy. Cases apparently requiring ARSENIC had become worse under its administration and were brought round by VERATRUM, and *vice versâ*. But as a general rule we have found that where CAMPHOR should have been given first we have the worst result from ARSENIC, VERATRUM, &c. Then again the similarity between ARSENIC and ACONITE in some respects is so great as to render the differentiation between the two of extreme difficulty. A faithful narration of cases successfully treated by ARSENIC can alone clear up the obscure points. In the generality of cases, however, in addition to the three marked characteristics of the drug, namely, excessive restlessness causing the patient to toss about in bed, the peculiar unquenchable thirst causing him to drink often but little at a time, and the burning of the stomach and of the rectum and anus, and may be of the rest of the alimentary canal, we have adynamia quite out of proportion to the apparent extent of the disease, and the mental symptoms, such as indescribable melancholy, absolute hopelessness and despair, constant dread of death, which will decide in favor of ARSENIC. The drug has been found useful in dread of cholera. Sometimes, especially in children, the constitution breaks down after an attack of cholera, and chronic diarrhœa and dysentery accompanied with general marasmus takes place. In such cases ARSENIC should be thought of.

It should be noted that ARSENICUM has actual suppression of urine which VERATRUM has not. But the presence of this symptom in any case is no contra-indication for VERATRUM. It has often by itself restored the urinary secretion after causing improvement in the stools and vomiting.

When the cholera declares itself at once in the spasmodic form, the spasms being simultaneous with the first vomiting and purging, and being as alarming as these and other symptoms, or when the spasms become developed in the course of the treatment and in spite of it, our chief reliance is on **Cuprum** and **Secale.**

We have seen what Hahnemann understood by the first stage of the disease for which his infallible remedy is Camphor. When that stage is passed, when, says he, "this period of the commencement of the disease, so favorable to recovery and speedy cure, by the above indicated employment of Camphor, has been neglected, then things look worse; then Camphor is no longer serviceable." He then gives the following description of the second stage: "There are moreover cases of cholera, especially in northern regions, where this first stage, with its tonic spasmodic character, is hardly observable and the disease passes instantly into the second stage of clonic spasmodic character: frequent evacuation of watery fluid, mixed with whitish, yellowish, or reddish flakes, and, along with insatiable thirst and loud rumbling in the belly, violent vomiting of large quantities of the same fluid, with increased agitation, groaning and yawning, icy coldness of the whole body, even of the tongue, and marbled blue appearance of the arms, hands and face, with fixed sunken eyes, diminution of the senses, slow pulse, excessively painful cramp in the calves, and spasms of the limbs. In such cases the administration of a drop of Camphor spirit every five minutes must only be continued so long as *decided* benefit is observable (which with a remedy of such rapid action as Camphor manifests itself within a quarter of an hour). If in such cases decided benefit is not soon perceived, then no time must be lost in administering the remedy of the second stage." This, as he says immediately, is **Cuprum.**

In the *Chronic Diseases* Hahnemann gives, not as the result of provings by himself and fellow-provers, but as citations from old school authorities, the following symptoms of CUPRUM relating to the stomach and bowels: "Extremely violent thirst; constant, violent vomiting, with colic and diarrhœa, like cholera; frequent vomiting of mere bile; bloody diarrhœa." One of his provers (Ruckert) had "vomiting of water, after

slight nausea, while much water flows from the eyes." He himself had the symptom: "the vomiting was suppressed by drinking cold water." In Allen's *Encyclopædia* under Cuprum we find the symptom, "Cutting pains, with *three stools like water*, the abdomen being painful on touch, recurring several times through the day," produced in provers taking Fincke's transcendental potencies. Under *Cuprum aceticum* we find the symptom, "Awakened at 2 A.M., while lying on abdomen (an unusual position with him,) by a copious liquid stool, so hurried that it escaped over a portion of the bed, with colic and headache," as a result of poisoning by artichokes kept in a copper vessel.

If the gastro-enteric symptoms given above are genuine, (which there is no reason to question except for the symptom obtained from Fincke's potencies), then there can be no doubt that Copper is homœopathic to cholera? We have a striking proof of the choleraic character of the copper stools furnished by Hempel, who, in the 2nd Edition of his *Materia Medica*, has related the cases of poisoning of a lady of sixty-seven years, of her daughter aged thirty-nine, and of a servant girl, twenty-two years old, from partaking of chicken fricassee, which had been cooked in a badly tinned copper saucepan. In all these the symptoms were "ineffectual effort to vomit, contraction and dryness in the inner mouth, thirst, violent pains in the epigastrium, colic, followed by several *watery whitish stools*. These symptoms continued on the following morning; the daughter was moreover attacked with uninterrupted anguish, convulsions, painful and hard swelling of the abdominal walls and frequent fainting turns." These appear to be genuine symptoms of copper poisoning, but why the cases have been removed from the last (3rd) Edition of the work by Dr. Arndt we cannot make out. Then again, the symptom derived from a case of poisoning by artichokes kept in a copper vessel, cited above, has a great similarity to cholera evacuation from the time of its occurrence which was 2 o'clock in the night, and also from its character. As we have no reason to doubt the genuineness of these symptoms, we are forced to admit that though the gastro-enteric action of copper and its salts are generally and eminently inflammatory, yet that action, like the gastro-enteric action of arsenic, may also be, in particular cases and

under particular conditions, non-inflammatory in the beginning, and thus so far analogise with the action of the cholera poison. In view of the fact that different constitutions vary so materially as to give rise to different temperaments and idiosyncracies, it is no wonder that the actions of the same drug on all provers should not be the same, as the actions of inorganic substances on each other are.

But it is not the stools alone which constitute Copper homœopathic to cholera. We have the greatest similarity presented by the drug when, associated with the characteristic stools and vomiting, we have spasms of the muscles. What is the characteristic of the spasms in cholera to which Copper corresponds? Hahnemann, as we have seen, recommended Cuprum in cholera when the disease has passed into the second stage, or, as he calls it, the stage of *clonic spasmodic* character. Clonic spasms are convulsions, and except in the very rare cases of children, and in some of the rarest cerebral sequelæ of the disease in adults, convulsions or clonic spasms never form a symptom of cholera. It is true Hahnemann derived his knowledge of cholera from reports. But we cannot believe that in any professional report of the disease convulsions were described as a symptom. It is difficult, therefore, to understand how Hahnemann could have made such a mistake. From the narration of the symptoms that he gives of this stage, we cannot make out if he looked upon convulsions as one of them. "Excessively painful cramp in the calves, and spasms of the limbs," are all the details he gives of the spasms. Though "cramp in the calves" belongs to the category of tonic spasm, "spasms of the limbs" is a vague term, and might mean tonic or clonic spasms, and we have no means of ascertaining which was meant by Hahnemann. But we need not attach much importance to what Hahnemann might have understood by clonic spasmodic, when we know that Copper is capable of producing both tonic and clonic spasms, cramps and convulsions. Provings and poisonings show that Copper can produce spasms in the muscles of the extremities; in the muscles of the abdomen; in the muscles of the chest, causing spasmodic attacks of dyspnœa, and rendering the respiration difficult even to suffocation; probably the spasm of the diaphragm have much to do with such arrest of breathing.

Copper produces spasms also in the muscles of the jaws and of the throat. Thus copper very closely approaches that variety of cholera which is characterised equally by gastro-enteric irritation and by tonic spasms of the voluntary muscles, and probably also of the diaphragm. One characteristic of Cuprum spasms is, according to Lilienthal, that they start from the utmost extremities of the peripheral nerves, of the fingers and toes. Though this is not substantiated by positive provings we may just bear it in mind, in order to see if it will admit of clinical verification. Of the same nature is Kafka's differentiation between the spasms of Cuprum and those of Secale, namely, that the former are chiefly confined to the flexors, the latter to the extensors.

The indications for **Cuprum** receive additional support when any of the following symptoms are present in addition to those given above :—When drinking, the beverage descends into the œsophagus with a gurgling noise; when there is desire for warm food and drink rather than for cold; when with the nausea and vomiting there is the most violent, horrid colic in the abdomen; when there is restless tossing about and constant uneasiness; when the eyes are sunken, with blue rings around them; when the extremities are icy-cold, as well as the general surface; when there is tingling in the rectum as of ascarides; when there is spasm in the throat which hinders speech; when there is suffocative arrest of breathing.

In the present state of our knowledge it is extremely difficult, if at all possible, to determine which to prescribe in a given case of disease, the preparations of the metal or of any of its salts. The salts of the metal are certainly more energetic in their action than the metal itself, and hence as homœopathic remedies we would prefer the pure metal so long as it does not disappoint. If it fails to produce the desired effect we may then have recourse to the acetate, or even the sulphate which is a more easily obtainable salt.

Secale Cornutum has no place in the *Fragmenta, Materia Medica Pura*, and the *Chronic Diseases*. Hahnemann evidently had paid no attention to it. All our knowledge of its symptoms are from provings, poisonings and experiments on animals. We take the following from Allen's *Encyclopædia*, where will be found a rich collection of symptoms from 170 different sources: "Frequently

bites his tongue, which is often torn during the convulsions. Constant and intense thirst, with dryness of mouth and throat, burning and tingling of tongue, with inability to drink much on account of its causing distress in the stomach. Unnatural appetite, even when dying from exhausting discharges from the bowels; or complete loathing of food and drink. Urgent thirst, with longing only for acidulated drinks; loathes every thing but sour drinks. Nausea and vomiting. Sudden attacks of incessant vomiting at night, with most violent headache and pain over whole body. Either fruitless efforts to vomit, or easy vomiting affording relief. Nausea and vomiting of sour dark green matter, containing bile, mucus, and shreds of membrane; vomiting of blood, membrane, and coffee-grounds matter; vomiting of tenacious mucus or worms, giving relief. Great distress and oppression at stomach. Sensation of burning in internal organs. Long-lasting, very exhausting diarrhœa. Sharp diarrhœa yielding to repeated hot baths; thin, involuntary discharges from the bowels. Discharges from the bowels of a great quantity of disorganized mucous membrane as that thrown off in dysentery. Hæmorrhage from the bowels. Micturition seldom, difficult, dribbling, without relief. Urine diminished or entirely suppressed; urine albuminous with casts. Anxious difficult respiration, with sighing and hiccough. Pulse small, rapid or slow, intermittent or entirely absent. Face collapsed, sunken, livid, hippocratic. Lips bluish. Mouth distorted. Trismus. Voice feeble or almost lost. Power of deglutition nearly lost. Tonic and clonic spasms, emprosthotonus, opisthotonus, risus sardonicus, and raving. Spasms chiefly of the extensors, causing fingers and toes to be bent backward or spread apart. Restlessness and extreme prostration. Coldness of surface, particularly of the face and extremities. Notwithstanding this coldness, aversion to heat and to being covered, and is actually worse from external heat. Anxiety and fear of death."

The symptoms cited above furnish elements of morbid conditions which are often met with in cases of cholera. We have not been able to exactly ascertain who it was that introduced this precious drug into homœopathic practice in the treatment of cholera. Probably it was Dr. Friedrich Jacob Rummel, an early convert to Homœopathy, and who assisted Hahnemann in his provings.

Dr. Dudgeon, in his *Homœopathic Treatment and Prevention of the Asiatic Cholera*, says: "SECALE CORNUTUM is serviceable, according to Rummel, when after the cessation of vomiting the evacuations persist and continue colorless. Schmid and Fleischmann found it useful where there were severe cramps; the latter preferred it to CUPRUM in such cases. It is also invaluable in Cholerine, accompanied by vertigo, anxiety, cramps in the calves, diarrhœaic stools of a brownish color, or almost colorless, with or without flakes, with rapid prostration and coldness of the limbs. The following range of symptoms observed in one individual, from the ingestion of Secale, point most markedly to cholera. 'Sudden peculiar alteration of the features, the eyes are sunk deeply in their sockets, and are surrounded with blue circles, constant nausea and vomiting after partaking of anything, frequent diarrhœa, with watery, slimy evacuations, dry, cool skin, indescribable anxiety and burning sensation in the scrobiculus cordis, hoarse hollow voice, suppression of the urinary secretion, cramp in the calves, paralysis of the superior extremities, scarcely perceptible pulse, unquenchable thirst' (Siedel, *allg. Hom. Ztg.* I. p. 127).

Dr. Rutherfurd Russell, in his *Treatise on Epidemic Cholera*, thus speaks of it: "SECALE CORNUTUM, or ergot of rye, is a medicine in which we have great faith in some of the worst varieties of cholera. We have seen the most decided advantage from its administration in cases of very copious discharges both alvine and by vomiting. While we would recommend Cuprum and Veratrum to be given rather by themselves than in alternation, we should feel inclined to give Secale in alternation with Arsenicum. It is not easy to give a reason for this beyond the observation, that so given, we have seen more benefit to the patient than from either singly; and we do not think that the two medicines interfere. We should give it strong, in the first, second, or third dilution, a dose every half hour, alternately with Arsenic, and this in cases, particularly of women, where there is great prostration and violent watery discharges. We have seen cases, which we looked upon as quite hopeless, steadily rally under this treatment, and we have no doubt of the beneficial effects of the remedies."

We are now in a position to define the province of SECALE

more precisely as distinguished from CUPRUM and ARSENICUM, than was possible for the authors quoted above. The gurgling noise drinks make in descending down the œsophagus into the stomach, the desire for warm rather than for cold food and drink, and the peculiar character of the spasms affecting the flexors, distinguish CUPRUM from SECALE which is wanting in the first two symptoms, and which has spasms of the extensors and abductors rather than of the flexors and adductors. SECALE has moreover more frightful distortion of the features from spasms than CUPRUM has. Under SECALE the patient often bites the tongue, which is not the case with CUPRUM. SECALE and ARSENICUM have many symptoms in common. But even the thirst, which seems to be so similar, has this difference. The ARSENICUM patient has unquenchable thirst but drinks little at a time, because satisfied with it for the time being. The SECALE patient has also unquenchable thirst, but cannot and therefore does not drink much because it causes distress in the stomach. The SECALE patient notwithstanding the cold he feels, is averse to heat and being covered. The ARSENICUM patient, notwithstanding the feeling of internal heat, has a desire for heat and being covered. These differentiating characters were not known at the time Dr. Russell wrote, and hence his recommendation of alternating SECALE with ARSENICUM, which there is no necessity of acting up to, unless a case presents the prominent symptoms of both the drugs.

Whatever the character of the spasms in any case of cholera SECALE may be given when they are not relieved or only partially relieved by CUPRUM.

SECALE is preferred when any of the following symptoms are likewise present:—considerable dryness of the mouth and nose, not relieved by drinking water; vomiting of mucus, lumbrici, or ascarides; vomiting affords relief; vomiting without much effort.

To the late Dr. Edwin M. Hale, justly called the "Father of New Remedies," is due the credit of suggesting that **Ricinus** "ought to be useful in *Cholera Asiatica*, cholera morbus and infantum." To Dr. Leopold Salzer, of our city, is due the honor of first acting on this suggestion, and introducing it successfully in the homœopathic treatment of cholera in India. Dr. Hale's suggestion is based upon the following cases:

Giacomini relates that when a child he experienced a violent attack of vomiting and protracted exhaustion from eating nine or ten of the seeds. Bergius records the case of a man in full health who ate a single seed of *Ricinus*, which, however, left an acrid taste in his mouth. Early the next morning he was seized with violent vomiting, which continued alternately with purging throughout the entire day. Lanzoni saw a young woman attacked with violent cholera morbus, and an excruciating pain in the bowels, from eating three of the fresh seeds. Dr. Taylor records a fatal case of poisoning from this cause. Three young women ate of the seeds, one about twenty of them, another four or five, and a third two of them. Upon the two latter persons the effects were those of a violent cathartic, but the first was seized with vomiting and purging, and looked like one in an attack of malignant cholera; the skin was cold, pale, and shrunken, there was pain in the abdomen, and the mind was in a drowsy, half-conscious state. The dejections consisted of bloody serum. No reaction took place, and death occurred within twenty-four hours. On examination, the gastro-intestinal mucous membrane was found to be abraded and inflamed. A soldier in Algeria is said to have died from eating only three Castor oil seeds. The whole intestinal mucous membrane was found after death coated with blackish blood. The lining membrane of the stomach was somewhat reddened and softened.

A case is related by Bergius where only *one* seed produced symptoms of poisoning, namely, nausea, vomiting, and diarrhœa.

After twenty seeds, gastro-enteritis and death, preceded by convulsions and general collapse.

A young and strong man, after eating two grams of the residue of the seeds from which the oil had been expressed, was seized with such violent vomiting that his life was in danger.

Devergie states that two patients who had taken each an ounce of Castor oil died in three hours (!).

Bean, a sergeant in the seventh company of engineers, enters the hospital at half-past five, July 10th, 1871. He ate the same day, in the morning, some *Ricinus* seeds as a purgative. The seeds were perfectly ripe, dry, and gathered in the fall of 1869. As he did not find the taste very disagreeable he ate seventeen of them. No accident happened immediately after eating them, and he took some beef-tea with appetite. Three or four hours afterwards he passed several loose stools, and suffered soon afterwards from pyrosis, cramps in the stomach, and nausea, followed by vomiting, which contained fragments of the seeds and drops of oil floating on it. The stools became at the same time more numerous and copious, were passed without tenesmus or colic, formed of serous liquid mixed with mucus.

About 4 p.m. the diarrhœa became incessant, with cramps and chilliness; at 5 p. m. he entered the hospital.

Pathology.—Present state: Pale face, the forehead covered by cold sweat and features drawn; the eyes are convulsed and drawn upward in the orbits, the conjunctiva injected, and copious lachrymation; the pupils only moderately dilated; pulse normal in frequency, but so small that some-

times it can hardly be felt at the radial artery. Intelligence perfectly clear; patient complains of headache, vertigo, buzzing in the ears, and a sensation as if a bar laid over his stomach, with profound anguish. Burning thirst; pyrosis, nausea, vomiting; the vomited matter is fluid, lightly colored by some bile, and holds some glairy filaments suspended; epigastrium very sensitive, and the *pains radiate* towards the navel and hypochondria; neither light nor strong pressure aggravates the pain, at the same time the patient feels a sensation of violent constriction in the intestines; the diarrhœa becomes colliquative, and the stools look like those in cholera. Complete anuria since 10 a. m.; voice very veiled; profound adynamia; it takes two persons to hold the patient.

The time for antidotes had passed, and the only indication remained to combat the coldness, the muscular contractions, the stoppage in the circulation—in one word, to remove the pseudo-choleraic symptoms consecutive to the enormous loss of water the patient had sustained.

From these and other cases Allen has compiled the following summary of symptoms for his *Encyclopædia*: "Great, burning thirst: Pyrosis. Violent profuse vomiting, vomited matters colored by bile; violent vomiting and purging, accompanied by burning in gullet and stomach, with all symptoms of Asiatic cholera; vomiting without pain; yellowish-green vomitings and violent colics. Epigastrium very sensitive, and pains radiate towards navel and hypochondria. Cramps in stomach. Pain over abdomen increased by pressure. Diarrhœa *without pain*. Stools frequent and watery. A few stools; in three or four hours after taking the seeds, alvine evacuations became more and copious, in the form of a serous fluid mixed with mucus, they escaped without griping or colic; after about ten hours the diarrhœa became almost incessant, and was colliquative, presenting the same appearance as in cholera. At 4 P.M. the diarrhœa became incessant, with cramps and chilliness, at 5 P.M. it became colliquative and cholera-like. Bloody diarrhœa. Complete suppression of urine; emission of a small quantity of deeply-colored, thick, and highly albuminous urine. Voice very veiled. Pulse normal in frequency, but extremely small, sometimes scarcely perceptible at the wrist. Extreme collapse, accompanying the purging and vomiting. Muscles of limbs and of trunk affected with very painful cramps. Eyes convulsed and drawn upwards in the orbits. Coldness; forehead covered with cold sweat. Face pale; features contracted."

It will be seen how closely these symptoms resemble those of

true cholera. From the above narrations it will also be seen that so far as observed the stools and vomitings from the ingestion of the seeds were painless; whether they would be invariably so in every case is doubtful, in view of the fact that the stools from the ingestion of the oil are often attended with gripes and colic. But this much may be said that the evacuations of Ricinus are more generally painless than those of any other medicine. And though not actually described as rice-water like, they were said to be like those of cholera. They were all very profuse. These characters of the evacuations, with the collapse and the anuria and the cramps immediately following, point to Ricinus as a true, homœopathic remedy in this disease, and experience (including our own) has justified Dr. Hale's recommendation to a large, if not to the full extent that was expected from the pathogenesis. This shows that RICINUS is not the only remedy for cholera, and that there are others, especially those we have enumerated, which have a true place in its therapeutics and cannot be superseded.

So far as observed pathogeneses go RICINUS is distinguished from VERATRUM ALBUM in having anuria and painless stools and vomitings, and therefore should have the preference whenever such symptoms are present. But we must not forget the observed and often verified fact that whereas VERATRUM has often succeeded in painless cholera with anuria, RICINUS has failed in similar cases in which the former has proved beneficial. This shows that we are not yet in possession of the full pathogeneses of either of these drugs, and that therefore in the treatment of cholera as of other diseases while our chief guide should be the pathogenetic actions of drugs we must not hesitate to be guided by the accumulated experience of our school as well, which is too valuable a treasure to be thrown overboard in favour of imperfect provings. All provings, we may say, are necessarily imperfect, and their therapeutic value must be established by clinical verification.

RICINUS, nevertheless, is a very valuable addition to our stock of remedial agents for cholera; and it is not a little singular, as pointed out by Dr. Salzer, that it should be indigenous in a country where the disease is indigenous, though of course for obvious reasons not much importance can be attached to the coincidence.

Of the use of **aconitum** in the preliminary stage of the inflammatory variety of the disease, we have spoken above. From the experience we have had with the drug we are inclined to believe it is likely to be of considerable service in the other stages. Those who view cholera in the light of fever look upon aconite as the infallible specific in the disease. Without going this length we may say that this remedy has been but very little thought of by the homœopathic physician. Dr. Charles Julius Hempel was the first to recommend it in 1849 when an epidemic of the disease prevailed in America. He recommended strong doses of the concentrated tincture. We are not told whether it was at all tried in the United States; probably not, as "this recommendation was laughed at by some, and very coolly received by others." During the epidemic of 1865 the drug was actually tried by Dr. Cramoisy of France* (his name is spelt as

* "That which engages our attention most in the disease is the specific poison which accelerates the pulse, disturbs the whole economy, irritates the nervous system, and increases the contractions of the heart. What renders the pulse scarcely perceptible at such times we do not know. That the blood deprived of its water, circulates with more difficulty in the blood-vessels, during the last contractions by their natural elasticity, which in consequence lessens the vitality, we have not denied. But the practical idea we wish to establish as the essential feature of this disease, and the only one we have to guide us in our treatment is the *acceleration* or the *augmentation of the pulsations;* in a word it is this which we all characterise as *la fièvre.* That which we have advanced is not a hypothesis; for we can well remember in the cholera cases we examined when under our supervision in the Charity Hospital, 1854, and in our private clinique in 1865, that the increase of the pulse more or less coincided with the degree of the disease, and not with the anguish or suffering; because the pulse frequently disappeared at this moment....We have prescribed from fifteen to twenty drops of the *tincture of Aconite* in six to eight ounces of distilled water, a teaspoonful of the same to be taken every ten, twenty, or thirty minutes, according to the intensity of the symptoms. Under its influence, the patient begins to revive, the circulation of the blood returns to its normal condition; the pulse rises, the internal heat ceases"; the thirst is allayed, and the vomiting and diarrhœa arrested. At the same time the bluish cast of countenance disappears, the cadaverous expression changes to a natural one, the agitation of body and mind is replaced by a tranquil condition; the dread of death is transformed to joy and hope, and the patient recovers in three or four hours."—Dr. Cramoity on Aconite in Epidemic Cholera; Translated from the Bulletin de la Société Méd. Homœop. de France in the *North American Journal of Homœopathy, May* 1867.

Cramoity in the *N. A. J. Hom.*) and found to be highly beneficial. He has reported several cases (twelve according to Dr. Hughes) "where the patients, after having been fruitlessly treated with the usual cholera-remedies, such as, *Camphor, Veratrum, Arsenicum, Cuprum,* and sinking very fast into the last stage of collapse, were speedily and completely cured with large doses of the concentrated tincture of Aconite." On the strength of this fact Dr. Hempel asks: "Indeed, why should Aconite be overlooked as a great and specific remedy for cholera? If there is any truth in the homœopathic law, the effects of Aconite upon the normal human organism point to it as a remedy for cholera. We do not think that it supersedes the use of other valuable specifics for this terrible epidemic, nor do they, on the other hand, supersede the use of Aconite. A few cases of poisoning*

* The following are the most striking among the cases cited by Dr. Hempel:

A man, forty-five years of age, under the treatment of rheumatism, swallowed a teaspoonful of liniment composed of equal parts of the tincture of Aconite-root and water. This was followed by pain in the epigastrium, numbness of the hands and feet, and a sense of formication over the whole body. One hour after, the dose was repeated. At the time of my visit, an hour and a half after the first dose, the man had swallowed over a drachm of the strongest tincture of the root. I found him in a complete state of collapse; after the second dose he had vomited repeatedly, first bilious matter changing into copious watery discharges; he had also had several very large *rice-water* discharges from the bowels; he complained of terrible pain and anxiety about the heart, was pulseless, skin cold and clammy, face indicative of great suffering and fear, breath cold to the hand; occasional paroxyms of general opisthotonic spasms would leave him in a prostrated condition in which it would seem that his constantly expressed fear that he should die, was about to be realized.

By mistake a child was given a teaspoonful of the strong tincture of Aconite-root. The patient was a boy, six years of age. Doctor Hays of Covington, Ky., where the poisoning occurred, reports as follows: I found the patient so much prostrated that, had there been an epidemic of cholera, and had I no examination to aid me, or any previous history, but had to depend upon the appearance of the patient, I would undoubtedly have pronounced it a collapsed state of cholera. The skin was cold, clammy and livid, with a profuse perspiration, there was no pulse to be felt at the wrist, the action of the heart was quite feeble and irregular, the capillaries were scarcely able to be filled when their contents were poured out. The head was cold, the eyes natural in appearance, except the dilatation of the pupils which was extreme and not at all sensitive to

will conclusively demonstrate the homœopathicity of Aconite to Asiatic cholera. With high potencies, we must of course, not expect to accomplish every thing; large doses of the concentrated tincture are required to produce a curative effect."

Aconitum then has pathogenetic effects in addition to those we have already enumerated, which analogise strongly with the characteristic symptoms of cholera. It has burning and numbness of stomach; it has burning feeling from stomach up through œsophagus to mouth; it has vomiting, followed by thirst; it has inclination to vomiting, with violent diarrhœa; it has vomiting and watery diarrhœa; it has vomiting after each drink; it has vomiting of blood, followed by perspiration; it has painless diarrhœa of rice-water stools; it has the hippocratic countenance so distinctive of cholera; it has bluish face with black lips; it has coldness of the extremities with blueness of the nails of the toes and fingers, coldness of the extremities with collapse of pulse; it has coldness of the tongue. It has scanty urine passed with burning and difficulty, and it has also total suppression of urine.

We have found from half a drop to one-tenth or even one-twentieth of a drop of the mother tincture for a dose, repeated once or twice, quite enough to bring about a curative action. Somehow or other the dilutions do not act beneficially at all. Drop-doses may be used, but there is no need of more massive ones.

Camphor: After what we have said about this drug under the treatment of the first stage, we need not say much as regards its employment in the treatment of the second stage. We here recapitulate the symptoms which it can undoubtedly produce, and which correspond with the symptoms of a large number of cases of the disease: Depressed, sad, out of humor; great anxiety and extreme restlessness, tossing about in bed; attempted to stand but lay down again; falls down, without consciousness, with howling cries; staggered as if drunk; vertigo, so severe as to oblige him to sit down to prevent falling; countenance pale, distorted, sunken, bluish; great difficulty of speech and thought, speech

the effects of light. The facial expression was haggard, the nose pinched, the breathing extremely laboured, the lungs were filled with mucus, the rattle of which could be distinctly heard in any part of the room. The patient's bowels moved several times involuntarily. Under proper treatment the boy recovered.

broken, feeble, hoarse; continued thirst, with frequent drinking; longing for drinks, without thirst; nausea and vomiting, especially mornings; vomiting of yellow, watery liquid; vomiting like rice-water; coldness in stomach; great burning and sensation of heat in stomach; stool dark brown, thin, watery; stool rice-water like; urine diminished; in drops or suppressed, retention of urine; great anxiety in the precordial region; heart-beats and pulse slow and intermittent; pulse very weak, scarcely or not at all perceptible, spasms, tonic and clonic; convulsive circular motion (rotation of arms); catalepsy; feeling as if drunk, with staggering; body generally quite cold; cold, clammy sweat.

If these are the genuine symptoms of Camphor, about which we have not the least doubt whatever, then we should have no hesitation in prescribing the drug in the first and second stages of cholera on homœopathic principles, and it matters not in what doses we administer it, provided the doses are short of the doses which produce the pathogenetic effects. As these latter doses are very large, sometimes not less than a drachm or more, we do not think that drop doses, or two-drop, or even five-drop doses would be massive in comparison. So far as our own experience teaches us, drop-doses in sugar or sugar-puffs (*batasa*, বাতাসা) are quite enough for adults. For children a quarter of a drop, or even less is sufficient. And, as we have said above, circumstances may require the exhibition of dilutions.

The drugs that we have pointed out as useful in the stage of full development of the disease, are those ordinarily used. There are others whose pathogeneses point to their probable utility as remedies of this stage. These are:

1. Jatropha curcas,
2. Tabacum,
3. Antimonium tartaricum,
4. Elaterium,
5. Croton tiglium,
6. Ipecacuanha,
7. Euphorbia corollata,
8. Mercurius corrosivus,
9. Mercurius dulcis (calomel).

The following are their indications:—

Jatropha, which belongs to the same natural order as Ricinus,

namely, Euphorbiaceæ, has the following symptoms: Thirst, but dreads to drink on account of nausea; *easy* vomiting of a large quantity of watery substance resembling the white of an egg, together with watery diarrhœa (as if the contents of the rectum would gush out like a torrent), accompanied by anxiety with burning at the stomach, anguish, coldness of the body, viscid sweat, violent cramp-pains in the lower limbs to such an extent that the calves look flat like splints. Watery diarrhœa as if it spurted from him; stools copious, mucous, and not unlike the well-known rice-water stools; thin stool preceded and followed by much rumbling, and at times a noise as if a bottle were being emptied. Notwithstanding the very copious evacuations from the stomach and bowels, JATROPHA has not been found to produce anuria or suppression of urine. In this it resembles VERATRUM and differs from Ricinus. We are inclined to think that in many cases of cholera VERATRUM has been used where JATROPHA should have been. Hering has gone so far as to say that JATROPHA should be preferred to VERATRUM in the treatment of this disease. They have, however, distinguishing characteristics which make their selection easy.

Tabacum: This drug, though recommended for trial, does not appear to have been actually tried in cholera. Dr. Russell has given it a place in his *Treatise*, but says he has little experience of it. "The cases for which it would best answer are," according to him, "those attended with much depression, vomiting, eructations, and obstinate dysuria, or suppression of urine, along with pains in the bowels and cramps, and oppression of the chest." The following symptoms which it produces give a more precise and larger sphere of its usefulness: Most profound gloom, constant fear of death, yet attempting suicide; vertigo and intoxication, worse indoors, better in open air; deathly paleness with the nausea; face pale, collapsed, covered with cold sweat, deeply sunken eyes, surrounded by blue rings; dryness of whole mouth, tongue, and lips, with violent thirst; speech difficult and unintelligible; incessant nausea and vomiting, worse indoors and from movement, better in open air; violent vomiting and diarrhœa, of watery liquid; vomiting in a stream; generally relief from vomiting; sinking at pit of stomach; heat and burning in stomach and epigastrium; suppres-

sion of urine (increased secretion is a more constant symptom); difficult, oppressed respiration; violent constriction of the chest; heart's action very feeble, nearly or completely paralysed; pulse weak, intermittent, skin cold and covered with clammy sweat; pulselessness; cramp from the toes to the knee; violent spasms and convulsions, first of the arms, then of the legs, and afterwards of the whole body, followed by great prostration; whole body icy-cold, streaming with cold sweat.

The most prominent characteristic of this drug is that, however introduced, whether by the mouth or even applied externally, it produces almost unceasing nausea and vomiting. It is, therefore, according to Noack and Trinks, likely to be useful in those cases in which, after the purging having yielded to other drugs, the nausea and vomiting become persistent, recurring in constant paroxysms, being at times more violent, and when there are also cold sweat, oppression at the stomach, some anguish and restlessness, cramp and tearing in the limbs, occasional clawing in the calves; remembering that the characteristic of the tabacum nausea and vomiting is that they are aggravated on the slightest movement, and that the vomiting occurs sometimes in a stream.

Dr. Bell would seem to recommend TABACUM in cholera without stool, vomiting, or thirst; but the symptoms given above do not justify the recommendation.

Antimonium Tartaricum, (tartar emetic): The pathogenesis of this drug points it out as likely to be very useful in cholera, especially in the grastro-enteric variety. Tartar emetic would seem to be particularly indicated in those cases in which an alternation of vomiting and purging takes place; that is, on the cessation or amelioration of the vomiting, the purging becomes aggravated, and *vice versâ*. We believe tartar emetic would, if tried, be found to rank next to arsenic as an anti-choleraic remedy. In mild and sporadic cases we would prefer it to arsenic. As a general rule arsenic should be used in cases where the tendency is obviously to death; tartarized antimony in those in which the chances of recovery would seem to be greater.*

* "One of the remarkable characters of the acute form (of antimonial poisoning) is that, in spite of the violence and severity of the symptoms, even when the collapse and depression appear to indicate impending dis-

The following pathogenetic symptoms would enable us to prescribe it precisely: Hopeless despondent mood, dreads to be alone; state of stupor, interrupted by spasms; vertigo, on walking, on closing eyes, on lifting head; pale sunken face, covered with cold sweat; constant and insatiable thirst, or absence of thirst; violent nausea and incessant enormous vomiting, with purging and prostration; burning heat and cramps in stomach; the abdomen seems stuffed full of stones; copious alvine evacuations; very watery diarrhœa with vomiting; very offensive diarrhœaic stools; involuntary, watery, blood-streaked stools; urine more copious and frequent at first, afterwards diminishes; albuminous urine; respiration heavy, anxious, difficult, rapid; feels as if he would suffocate, cannot get sufficient air, has to sit up whole night; oppression of the heart; violent palpitation, pulse rapid, weak, trembling; contracted, hardly perceptible; insensibility and coldness of the limbs, weak, almost imperceptible pulse, without vomiting (child); excessive restlessness, vertigo, syncope; convulsions and tetanic spasms, with loss of consciousness; cold sweat all over the body.

Elaterium: Pereira says: "Elaterium powerfully excites the secreting and exhaling vessels of the alimentary canal, and thereby occasions very watery stools: hence the term *hydragogue* applied to it. In some dropsical cases I have known a single dose discharge several pints of fluid by the bowels. The gripings and the increased number of evacuations prove that the irritation is not confined to the mucous coat, but is extended to the muscular coat. Under the influence of a full dose, the pulse is excited, the tongue becomes dry, and sometimes furred, and great thirst is produced. Occasionally the skin becomes damp under the operation of the medicine." The following is Dr. Chambers' description of the physiological action of the drug:—"It causes an enormous flow of watery serum from the first mucous membrane that absorbs it. If its vapour be drawn up

solution, there is an astonishing power of recovery. When one large dose is only administered the case proceeds to recovery or death, generally the former, if the case is placed early under treatment. In this respect, acute antimonial is distinguished from acute arsenical poisoning. In the latter, in spite of early treatment, and the removal of the whole or greater part of the poison from the stomach, the case frequently terminates fatally." Taylor, *On Poisons*, 2nd Ed., pp. 537-8, 3rd Ed. pp. 458-9.

into the nostrils for a short time, it is a powerful errhine, and is followed by the secretion of floods of water from the Schneidetian membrane; if it is dissolved in the œsophagus it causes such a deluge of the gastric fluids, that the stomach cannot contain them, and they are rejected by vomiting; if it succeed in passing the pylorus, a choleraic diarrhœa gushes forth, stripping the mucous membrane of its epithelium just like its morbid prototype." From this Dr. Hughes rightly infers: "Elaterium would thus seem homœopathic to choleraic diarrhœa and vomiting. There is this difference, that the prolonged action of elaterium sets up gastro-enteritis, which the cholera poison never does." He recommends its trial in cases in which the excessive *quantity* of evacuations is especially noticeable.

We have no good proving of this drug, and consequently its selection cannot be made with strict homœopathic precision. We give the following meagre summary of its symptoms from Allen, which may help in this direction: Depression of spirits; fear of some approaching disaster. Bitter taste, with salivation; nausea, which continued till after two liquid stools; vomiting of a dark-brown fluid mixed with food, without pain, flatus, or nausea, with much prostration; frequent vomiting of a small quantity of clear liquid, followed by discharge of copious greenish substance; copious liquid stools; watery discharges of a frothy character; copious, painless motions, until the bowels were fairly emptied.

It will be seen that except the enormous quantity of the evacuations by the bowels and the stomach, which are painless, there are no other symptoms, such as anuria, cramps, collapse, &c., which can point to it as a remedy for cholera. It may serve as an intercurrent remedy when the profuse discharges prove to be obstinate.

Croton tiglium: Among the pathogenetic symptoms of this drug we have as especially characteristic:—Sadness; great depression of spirits; anxiety; vertigo, especially on the right side, worse when walking in open air; face, hands, and toes cyanotic; countenance pale and shrunk, with sensation of coldness; mouth dry and parched; intense thirst; insufferable nausea, with inflation of bowels and borborygmi in epigastric region; vomiting, borborygmi, and diarrhœa; violent vomiting

of the ingesta after previous violent nausea; sudden, violent, repeated attacks of vomiting of a yellowish white frothy fluid occasioning the most violent efforts of the stomach; anguish, oppression, and pressure in the region of the stomach, with great nausea and accumulation of water in the mouth; violent burning in the stomach; numerous liquid evacuations with tenesmus, without colic, or with nausea and colic; liquid diarrhœaic stools, resembling yellow-colored water, forcibly evacuated and coming out like a shot; violent purging, with a disagreeable sensation through the whole body, and nauseous taste; watery, painless stool; sweat during stool. Anxious, oppressed, difficult respirations; sensation as though he could not get air enough into the air-cells, and could not perfectly expand the lungs; palpitation of the heart, and accelerated, small, feeble pulse; coldness, especially of the lower extremities, extending from the feet to the calves. In addition to these we have weakness and sick feeling; fainting spell; prostration of whole body, with frequent slight nausea, following stool; constant fainting, and deathly indescribable feeling of prostration during and after vomiting; lay in a lethargic state, sometimes drawing himself up as if in pain; generally lying quiet on belly, but occasionally tossing himself.

"The purgation produced by Croton," observes Dr. Hughes, "seems not the result of inflammatory irritation, but rather of such a transudation of the watery part of the blood as is caused by Elaterium and Veratrum album, and obtains in Asiatic cholera. The accompanying symptoms in severe cases are strikingly choleraic in character: and Croton might fairly take rank among the remedies for *choleraic diarrhœa*, for which indeed Dr. Jousset recommends it." According to Dr. Bell, "the three highly characteristic symptoms of CROT. TIG.,—the yellow watery stool, the sudden expulsion, and aggravation from drink and food,—form a trio whose presence will render success certain and brilliant. This stool is not always painful." This last fact of painless watery stools being produced by CROTON would entitle it to have a place in the therapeutics of the fully developed disease.

Ipecacuanha: A case of poisoning with this drug (35 grains of the powder in one dose) was published in the *Calcutta Journal of Medicine* (1874, Vol vii, pp. 447-9). It has added materially to our knowledge of its pathogenetic effects. From this case it is

seen that IPECACUANHA produces *watery* stools, which are often passed *involuntarily* in bed without the patient being aware of it, and that the stools are greenish or yellowish-green at first, but becomes fainter, till it is difficult to say whether they have any color at all. In this case the morbi-genic action of the drug was exerted chiefly upon the intestinal tract and liver and very slightly upon the stomach itself, thus verifying the pretty general law, that in cases under the influence of all gastro-enteric irritants, when the gastric disturbances are less, the intestinal disturbances are greater, and *vice versâ*. This case has precisionized the spasmodic symptoms of IPECACUANHA. In the *Materia Medica Pura* Hahnemann tells us: it produces "symptoms of emprosthotonus and opisthotonus; the body of the child is stretched out stiffly; stiff extension of the whole body, followed by a spasmodic clapping together of the arms." From our case we have clear proof of its power of producing spasms of a definite character in both the upper and lower extremities which commence at the fingers and toes and extend upwards. It produces also spasms of the muscles of the neck, especially of the sterno-cleido-mastoids. This is a striking characteristic. Taking all the symptoms into account we make bold to say that IPECACUANHA would be an admirable remedy in cholera even in the stage of its full development when there is nausea but no vomiting, when along with copious involuntary stools there are severe cramps of the extremities and *of the neck*, and when the stools are attended and followed by distressing griping and colic; or when the gastric symptoms—nausea and vomiting—predominate and the intestinal symptoms are less severe. It would evidently not be so well suited to cases in which the stools are *painless*. The fact, that it can produce involuntary stools of which the patient is not aware, would not altogether exclude such cases.

Euphorbia corollata: The following symptoms, produced by this drug on Dr. A. R. Brown, of Litchfield, Mich., who at one time took 25 grains of the powdered root, and at another 2 or 3 grains every two or three hours, have been reported by Dr. Hale: Great anxiety. Suddenly, with no premonitory symptoms of pain a distressing sense of deathly nausea set in accompanied in a few minutes by faintness; then *sudden and powerful vomiting, of first food, &c., in the stomach, then large quantities of water mixed*

with mucus, then clear fluid like rice-water. In less than a minute after the vomiting commenced, great commotion in the bowels, followed immediately by copious watery evacuations; this simultaneous vomiting and diarrhœa continued for nearly an hour, at short intervals, or intermissions, all the while accompanied by great anxiety, a death-like sense of faintness and exhaustion. During the height of its action the pulse sank to 40. After 50 grains the symptoms were much more intense, but lasted only a little longer. Cool skin, covered with beaded sweat. Cold hands, feet, and nose.

Thus, as Dr. Hale has rightly observed, "the sphere of the action of EUPHORBIA (corollata) is on the mucous membrane of the intestinal canal, which it affects in a manner similar to Croton tiglium, Elaterium, Jalapa, Helleborus niger, and Veratrum album,...affording us a good picture of *cholera, cholera morbus, cholera infantum*, &c., in which diseases I have used it as successfully in many cases as I have its analogues. It acts well in such colliquative discharges when given in the 3x to 6x dilutions."

One case was reported to us sometime ago as having been cured by the drug after failure of other drugs. In the above narration of Dr. Brown's symptoms the vomit is described as rice-water though the stools are said to be simply copious and watery; whether these were rice-water-like, or whether further proving would have developed such stools, is more than can be safely affirmed. We must remember that it is not every case of cholera which has both rice-water vomit and stool. And therefore in the dearth of genuine cholera-remedies the practitioner should do well to remember EUPHORBIA COROLLATA.

Mercurius corrosivus: Pathogenetically the difference between Arsenic and Corrosive sublimate is that the latter produces symptoms much more rapidly, and its action upon the alimentary canal, especially upon the colon, is more of an inflammatory nature. It is not a little singular that while the mouth, stomach and the colon are deeply affected by the drug, the small intestines are untouched. Dr. Taylor has well observed that "the symptoms produced by Corrosive sublimate, in the first instance, resemble those of cholera; if the person should survive several days, they in some respects assume the character of dysentery." Corrosive

sublimate is one of the most, if not *the* most, approved remedies in dysentery. And we are of opinion it is likely to be of use in those cases of cholera in which the stools are from the beginning mixed with blood, showing a tendency to dysentery; and also in cases in which choleraic symptoms have developed *after* an attack of dysentery. Suppression of urine is a predominant symptom of Corrosive sublimate.

The following pathogenetic symptoms will help in its selection: Great anxiety, dared not stir as the pain and vomiting were renewed by the least pressure on the stomach; stupor and delirium; repeated attacks of vertigo; countenance pale and anxious and features pinched; hippocratic countenance, sunken eyes, as in cholera; insatiable thirst, called for cold water in large quantities; violent vomiting and purging; incessant, very copious, green, bilious vomiting; repeated vomiting, first of food, then of serum; vomiting of dark frothy substance, followed by purging; vomiting of a thick, stringy, albuminous substance; vomiting of a clear fluid like water, mixed with fresh blood; vomiting and purging of bloody mucus and membranous flakes; great sensitiveness of the epigastric region; burning in stomach; several watery stools, with colic; diarrhœa and bloody stools; sero-sanguineous stools. Partial and afterwards complete suppression of urine; blackish albuminous urine; bloody urine. Difficult respiration. Heart beat tremulous, undulating; seemed remote and slow; intermittent; pulse small, feeble, irregular, intermittent; scarcely perceptible. Tonic spasms involving the neck and back, hands and feet livid; cold, shrunken; convulsions of the right upper and lower extremities; spasmodic convulsions of fingers and toes. Dorsal decubitus, with knees bent up. Spasms, first in the toes and feet, then in the fingers and hands; afterwards extending up the legs and arms; a violent spasm attacked the right breast and shot through to the back; spasmodic motions of muscles of the face. Constant restlessness and tossing about; general state of collapse; skin cold and clammy, dripping with perspiration.

Mercurius dulcis or **Calomel**: This is by far a milder preparation of mercury than Corrosive sublimate. It was till lately very extensively used and chiefly relied upon by the Old School in the treatment of cholera. The drug must have been originally

proposed on the ground of its influencing the liver, in cholera the function of that organ being supposed to be paralysed. Recent experiments having shown that Calomel, in repeated doses, produces rather a-bilious than bilious stools, have proved quite a puzzle to the members of the old school who are in the habit of using the drug for the purpose of promoting the biliary secretion. To homœopaths who are familiar with the double action of drugs, the puzzle is quite easy of explanation. Indeed, in this fact we see one reason of the occasional success of Calomel in cholera. Calomel is so far homœopathic to the disease that it can produce a-bilious diarrhœaic stools. The use of Calomel, however, in cholera is not so much its homœopathicity to the disease as its defibrinating or diquefying influence upon the blood. In the algide stage one of the great dangers is from coagulation of the blood in the pulmonary vessels and in the chambers of the heart, as evidenced by distressing dyspnœa and pallor of the countenance. Such a state of things is capable of being prevented by the timely exhibition of Calomel in appreciable but not the very big and repeated doses used by the old school. We shall recur to it when we come to treat of the collapse.

The following pathogenetic symptoms of CALOMEL would be worth remembering: Considerably agitated and apprehensive. Face pallid as a corpse. Urgent thirst; profuse vomiting and diarrhœa; watery diarrhœa; gripings, abdominal fulness, burning in epigastric and umbilical regions, followed by copious serous discharges which became gradually less, and in course of seven or eight hours were very small and composed of bloody mucus with tenesmus; stools watery, green, and small. Urine at first increased then diminished. Asthma. Uneasy and restless. Occasionally faint; much prostration. Convulsive paroxysms presenting frightful appearances. It will be seen that though the symptoms are very few and meagre they have some bearing on cholera, and if we have occasion to use it, which we shall have seldom to do, we shall have the consolation that we are not using an un-homœopathic remedy. We should on no account use the massive doses of the old school. A grain or two of triturations from the first to the third decimal would be quite enough for a dose.

Besides the minor remedies we have enumerated above, some

of the remedies we have mentioned under the TREATMENT OF THE FIRST STAGE have been found useful even in the STAGE OF FULL DEVELOPMENT, and notably **Aloe** and **Cantharis.** One of my pupils tells me that he has treated several cases of cholera in the stage of full development, when collapse had set in, most successfully with ALOE 30, after the approved remedies had failed. He was guided chiefly by the symptoms—hot, gushing stools with loud gurgling in the intestines. One of these cases I had the opportunity of watching, and I was quite satisfied with the result. In some of these cases the cure was nearly completed by ALOE, in others it had to be supplemented by other remedies such as CANTHARIS, SECALE, &c. But in every one the improvement after ALOE was marked, and paved the way for the action of the other remedies.

That ALOE should be so useful in cholera is a surprize even to homœopathic physicians. Has it symptoms, beyond "the hot gushing stools with gurgling in the intestine," which have any resemblance to the other symptoms of cholera? The following summary will show: Great anxiety, timorousness, dread of death, and great anguish; anthropophobia; great disinclination to mental labor; exhaustion alternating with activity; paroxysms of vertigo. Dryness of the mouth and throat with much thirst. Nausea with inability to vomit; nausea with pain in umbilical region increased by pressure, with diarrhœa. Watery, long-continued diarrhœa; stool very hot; stool passes without exertion, falling as it were out of the intestines; involuntary stool; frequent, audible rumbling in the abdomen, swashing and gurgling; insecurity of the anus, difficult to keep it closed and clean; stool passes while passing urine and flatus; blood with watery stools; stool with burning in the rectum. Thus ALOE has no vomiting, no anuria, no cramps, no symptoms of collapse. And yet it *has* been useful in the true cholera.

I have myself treated several cases of cholera in collapse with **Cantharis,** when the characteristic stools were going on and when there was suppression of urine from the beginning, after failure with MERCURIUS CORROSIVUS. The following pathogenetic symptoms of the drug will show how far they correspond with those of cholera: Extreme despondency, faint-heartedness, and anxiety; vertigo and fainting. Dry

mouth with violent thirst; thirstlessness; violent nausea, retching, and vomiting of the contents of the stomach, and bilious mucus; nausea and repeated vomiting, without exertion, of mucus and the ingesta; vomiting of membranous flakes; vomits the water he drinks, with a considerable quantity of blood; copious vomiting of bile. Epigastric region sensitive, externally and internally; heat and burning in stomach. Watery diarrhœa; violent diarrhœa with intolerable burning in anus; diarrhœa of frothy, green mucus; diarrhœa, without colic, or when colic is present it is relieved by the diarrhœa; intense strangury; retention and suppression of urine; bloody urine. Respiration hurried, difficult, oppressed. Violent palpitation; hard full pulse; pulse thready, feeble, scarcely perceptible; pulse slow, irregular, intermittent. Frightful convulsions and death. Extreme prostration; threatened syncope; great restlessness. Skin icy cold and clammy; cold sweat, especially of hands and feet. Thus CANTHARIS has some of the most essential symptoms of cholera, and it is no wonder that it should have proved so eminently successful in the treatment of its stages of full development and of collapse.

Sulphur and **Podophyllum** deserve a more careful study in the treatment of the STAGE OF FULL DEVELOPMENT than they have received at the hands of homœopathic physicians. They have characteristic symptoms, of stool, of vomiting, &c., which are sometimes met with in cholera at its height, and their exhibition in such cases is likely to exert a beneficial if not a thoroughly curative influence. We are sure that, as in the cases under ALOE cited above, they will modify the morbid process so as to pave the way for other remedies to act better, and this is no small gain.

Sulphur has the following symptoms which it would be well to bear in mind in treating cholera: Depressed about her illness, and out of humor; anxiety, as if he would cease to live; remarkable forgetfulness, especially for proper names. Vertigo, with nausea. Face pale and collapsed, with expression of great anxiety. Unusual thirst, with dryness and agglutination of mouth; much thirst after stool; nausea in stomach, with trembling of whole body; nausea with eructations; nausea and prostration, with trembling of limbs; nausea, even to faintness; vomiting, with profuse sweat; vomiting of very salt liquid as clear

as water; vomiting as soon as she eats or drinks; vomiting of food, with trembling of hands and feet. Feeling of weight in stomach; burning and heat in stomach, or feeling of coldness in epigastric region; griping in epigastric region, extending downward; violent cramp in stomach. Rumbling and gurgling in abdomen; emission of much flatus; before, during, and after stool, griping in intestines, and burning in anus. Diarrhœa, like water, always preceded by rumbling in abdomen, *without pain;* watery diarrhœa, several times; frequent, frothy diarrhœa, with tenesmus; stool evacuated rapidly and almost involuntarily, driving him out of bed; stools burning or scalding hot (not a pathogenetic but a very often verified symptom); stools chiefly early in the morning; stool, always soon after eating. Urine generally very copious, rarely scanty; no actual suppression. Shortness of breath. Palpitation of heart, attended by anxiety as though about to faint. Pulse, feeble, irregular, intermittent. Cramp in soles of feet, extending to toes. Great weariness and sleepiness. Faintness and vertigo, with much vomiting and perspiration.

Dr. Hering, in his *Guiding Symptoms*, has given the following group, as symptoms verified by cures: "Stupor, with pale face, dropping of lower jaw, eyes half open, cold sweat on face, suppression of urine, and frequent twitching of muscles." Dr. Bell has exactly copied them under Sulphur in his *Therapeutics of Diarrhœa*. So that here we have additional proof that Sulphur may be of use in true cholera, though it has but few of the characteristic symptoms of the disease. It should be remembered in this connection that Dr. Hering, on what grounds not stated, recommended SULPHUR as a prophylactic against cholera. His directions are: "Put half a teaspoonful of *Milk of Sulphur* into each of your stockings and go about your business; never go about with an empty stomach, eat no fresh bread, nor sour food. This is not only a preventative in Cholera, but also in many other epidemic diseases. Not one of the many thousands who have followed this, my advice, have been attacked by cholera. At the beginning, when you have diarrhœa, Sulphur will relieve you, take it at once, and if it must be repeated, dissolve a few globules of it in a tumblerful of water and take a spoonful after every evacuation. If you awake after midnight with violent

diarrhœa, vomiting, cramps in the calves of the legs, paleness and coldness, take *Sulphur* and keep quiet, the next day eat nothing but stale bread, and you will be well."

Podophyllum: The following symptoms, pathogenetic and clinical, will help in the selection of the drug: Vertigo, with inclination to fall forwards; headache, alternating with diarrhœa. Dryness of the mouth and tongue with violent thirst, or thirstlessness; extreme nausea; vomiting, without intermission, first of the contents of the stomach, then large quantities of bile; vomiting of hot, frothy mucus. Epigastrium and entire abdomen tympanitic and very tender, scarcely bearing the pressure of the bed-clothes; burning and heat in stomach; throbbing in epigastrium, followed by diarrhœa; pain in transverse colon, followed by diarrhœa. Diarrhœa immediately after eating and drinking; diarrhœa early in morning, continuing through forenoon, followed by a natural stool in evening; evacuations in morning, with strong urgings in bowels and heat and pain in anus; thin, watery, green discharges during the day; prolapsus ani and recti during stool; watery, flocculent discharges, very profuse and exhausting, with cramps in the abdominal and flexor muscles of the extremities (Hale). Scanty urine, with frequent voidings. Suppression of urine (clinical). Pulse very weak, scarcely perceptible at the wrist. Pain and cramps in right leg. Bathed in cold perspiration.

Notwithstanding the fact of violent thirst occasionally accompanying the dryness of mouth and tongue under this drug, thirstlessness would seem to be its predominant characteristic, as the success that has attended its use in diarrhœa and cholera has invariably been in those cases where the last symptom was present.

III.—**Algide Stage, or the Stage of Collapse,** is the most dangerous of all. The greatest number of deaths in cholera takes place in this stage. It is much easier to say when this stage ends, which is either in reaction or death, than when it begins. Yet for the successful treatment of this stage it is necessary to have an accurate idea of its commencement; and for this again it is necessary to have true conception of collapse and of the causes of collapse in cholera. Collapse is a falling in,

a sinking, or depression, of the vital energies, only short of but verging towards, actual dissolution. In this condition of the system there is a total suspension of functions of all the assimilating and secreting organs, such as the liver, the kidneys, the salivary glands; and very nearly the same of organs the most essential to the economy, such as the heart and the lungs, or of their governing nerve-centres. The heart continues to beat, and either it does not do so strongly enough to propel the blood through the capillaries, or there is not blood in sufficient quantity, or of proper consistency, to be propelled. The lungs continue to expand and contract, but the blood is not duly or at all oxygenated, most probably from the vital fluid having lost its power of absorbing oxygen.

This stage may be said to be chiefly characterized by negative symptoms. Vitality is at the lowest ebb. The pulse has retired from the wrist, and sometimes is not to be perceived in the brachial, and even not in the axillary artery. The respiration is either simply slow, or as is more frequently the case, hurried and labored, or sobbing—being quiet at times, and at times heaving. It becomes more and more difficult as collapse advances. All this is indicative of stagnation in the vessels of the lungs. In place of the natural warmth we have icy, clammy coldness; and in place of the hue of health we have a deadly pallor or livid or bluish tinge of the surface. The countenance has become pinched and ghastly; the extremities, especially the fingers and toes, palms and soles, look as if they have been long soaked in water. The eyes have sunk deep in their sockets, and become congested and lustreless. The voice is nil or has been reduced to a whisper. The restlessness of the second stage has given place to almost total insensibility to suffering. The senses have become dull, and the mind indifferent. Even the demand, which was so incessant in the state of full development, for cold water to quench the burning thirst, and for cool air to allay the sensation of burning heat in the skin, becomes less, and finally almost ceases. In this stage the cramps have either altogether ceased, or appear at considerably long intervals when the patients shriek out in agony. The evacuations are altogether stopped, or are small in quantity and passed involuntarily. There is complete suppression of urine. The patient,

but for the respiratory movements, and occasional tossing about, appears more dead than living.

The remedies useful in this stage are generally those useful in the stage of full development. But in addition we have others which are of signal service. Altogether we have to consider the following remedies :—

1. Camphor,
2. Aconitum,
3. Veratrum,
4. Arsenicum,
5. Cuprum,
6. Secale,
7. Carbo vegetabilis,
8. Hydrocyanic acid,
9. Cobra,
10. Lachesis,
11. Crotalus.

To these we may add as occasionally useful, **Ammonia, Alcohol, Ether**, so frequently and so unsuccessfully used by the old school.

In the treatment of collapse, the treatment of the previous stages must be borne in mind. It would be useless to employ remedies which have been already employed, and in spite of whose employment the collapse has set in. If however they have not been exhibited, they deserve a trial.

The indications of **camphor** and **aconitum** might be gathered from what has been already advanced regarding these drugs, and therefore need not be given here in detail.

Camphor, as Hahnemann has pointed out has been eminently successful in collapse when the disease begins with it. It has been also equally useful in the collapse succeeding the stage of full development. CAMPHOR may be usefully employed if too much of other medicines has been taken and in massive doses. In this latter circumstance it acts more as an antidote than otherwise.

Aconitum, as must have been seen from its pathogenesis, is an excellent remedy for collapse, especially of the syncopal variety, in which there is threatened rapid or gradual failure of the heart. The symptoms of the case to be treated should be taken note of from the onset to the setting in of collapse in order to see if there

is correspondence between them and the other symptoms of ACONITE. For otherwise the drug may not be useful at all.

Veratrum may be employed in sudden collapse, or in collapse which has resulted from excessive evacuations, provided of course it has not been already employed. The same remark applies to **Arsenicum, Cuprum,** and **Secale.** We employ ARSENICUM, when the collapse is out of proportion to the evacuations, when there is much tossing in bed, and when burning is complained of in the skin as well as in the stomach. We employ CUPRUM or SECALE when we have reason to believe the collapse has resulted from the violence of the cramps, or when cramps are still the prevailing condition, or when we fear death might result from sudden asphyxia or sudden syncope, as the effect of spasm of the diaphragm, of the pectoral muscles, or of the heart. The differential indications are to be gathered from what has been said before.

Carbo vegetabilis: Such authorities as Teste, Russell, Hempel, and Hughes* altogether question the usefulness of this drug in the collapse of cholera. Dr. Hughes, after his pronouncement on the drug in his *Pharmacodynamics,* as given in the Note below, in his *Principles and Practice of Homœopathy* says: "*Carbo*

* "I am disposed to think that it (carbo) is abused in epidemic cholera, for which some homœopaths consider it a specific remedy."—Teste, *Materia Medica*, p. 249.

"*Carbo vegetabilis* is said to have been useful in cases of great collapse, but for our part we cannot say we have any great faith in its efficacy in such a disease as cholera. We have tried it occasionally, but without obtaining any results."—Russell, *Epidemic Cholera*, p. 261.

"I am unable to perceive in what way Carbo is homœopathic to Asiatic cholera, where it has been used by some practitioners; the symptomatic similarity is entirely wanting and the use of this agent can only be accounted for on the ground of some general theory founded in the ideal rather than in natural and general experience."—Hempel, *Materia Medica.*

"There is an adynamia for which Carbo vegetabilis is specific. It is non-febrile, therein contrasted with that of Arsenic, and is attended by evidences (such as blueness and coldness) of defective circulation and imperfect oxydation of the blood. When such a condition exists in affections of the aged, and in advanced stages of typhus after the temperature has fallen, Carbo is an effectual rallier. But I cannot agree with those who see a Carbo adynamia in the collapse of cholera."—Hughes, *Pharmacodynamics*, p. 201.

vegetabilis was much used by Tessier to meet the later prostration of cholera, and Dr. Sircar seems to think it of value. But I am at a loss to perceive its appropriateness to the condition present; and British experience is against its efficacy." British experience may be unfavorable, but American experience is not altogether so. According to Dr. Joslin, CARBO VEGETABILIS is one of the principal remedies in the collapse of cholera. Dr. Fischer had cured several cases with CARBO 30 after collapse and paralysis had set in. And our own experience, as we found it in the very beginning of our practice, has been eminently in its favor.

CARBO VEGETABILIS is certainly not a rapidly acting drug, like the serpent venoms, Aconite, Arsenic, &c., producing profound collapse all at once, but under its action the following symptoms are developed which show that it can produce collapse in its own peculiar way, which is, we believe, by preventing the oxygenation of the blood: Breath quite cold; as also throat, mouth, and teeth. Icy cold hands and feet. Frequently wakes up in the night with coldness of the lower extremities. Exhaustion. Very frequent but only momentary attacks of fainting, causing him to sink down, accompanied by vertigo. Great anxiety and sensation of heat though she was cold all over to the touch. Weak, depressed pulse; frequent, excessive palpitations, with rapid beats, and intermittent pulse.

In cases where the collapse has gradually taken place, especially after the employment of the ordinary remedies, such as VERATRUM, ARSENIC, &c., CARBO acts admirably as a general stimulant. The pulse rises, heat returns to the tongue and the surface, the voice improves, the eyes regain their lustre and the patient gradually shakes off his dulness and apathy. CARBO is especially useful when there is tympanitic distension of the abdomen and when the stools have become fœtid. CARBO may be employed in alternation with VERATRUM or ARSENICUM, in cases where the characteristic discharges of these drugs are going on, provided of course they have not been previously used, or not sufficiently used.

It is not, however, in every case of collapse of cholera that CARBO VEGETABILIS will restore vitality to the patient. It is beneficial only when the body throughout is cold and covered with clammy sweat, and when the breath and tongue are cold, that is,

when the reduction of temperature is general. It has not succeeded when with the coldness of the extremities there is abnormal heat of the chest and of the head, a condition which I have found to be of the utmost gravity, and which hitherto has resisted almost all our remedial agents. CARBO VEGETABILIS is especially useful after ARSENICUM, more particularly when the latter has been abused, as it generally is, in cholera.

Acidum hydrocyanicum is useful, in fact, is the only remedy when along with pulselessness, cold clammy perspiration, involuntary evacuations, staring fixed look, dilated pupils, the respiration is slow, deep, gasping or difficult and spasmodic, taking place at long intervals, the patient appearing dead in the intermediate time. If any remedy is entitled to being spoken of as acting like a charm, it is HYDROCYANIC ACID. It would at times seem to restore animation to a corpse. Apparently dead, and humanly speaking, beyond all hopes of recovery, the patient revives under its influence, quite to the surprise of those around, and even of the physician. The quack nostrum *Chlorodyne* owes its occasional charming, but more often its deleterious effects in cholera to this agent, which is one of its constant ingredients. We cannot help taking this opportunity to remark how perversely prejudiced orthodox physicians prove themselves to be when they do not hesitate to use drugs of which the composition they cannot pretend to accurately know, whereas they refuse to use drugs which have been tried in the crucible of the healthy human constitution.

Dr. J. Rutherfurd Russell, in his *Treatise on Epidemic Cholera*, published in 1849, says: "*Hydrocyanic acid*, we have seen, gives at least temporary relief in a few cases where there was great prostration and oppression of the chest. One poor woman, a sober, respectable person, who had been ill for twelve hours when we saw her, and complained much of excessive uneasiness at the heart, exclaimed after a few doses of Hydrocyanic acid, 'God be thanked, my breast is getting benefit,' and for some time there was decided improvement both in her sensations and appearance. On the whole, however, we believe that the number of cases in which it is indicated, will not be found large, perhaps the particular period suited for its administration is very short."

This last remark is applicable not only to Hydrocyanic acid

but to all the drugs which our school has got into the habit of using in cholera, not even Camphor excepted. We have seen the administration of drugs in inappropriate cases and in unsuitable states to be attended with serious, often disastrous, consequences. We have seen Camphor to bring on vomiting where there was none, Cuprum to make the cramps more general and more frequent, Arsenic to aggravate the thirst and retching, vomiting, and restlessness, Veratrum to convert simple diarrhœa or cholerine as it may be called, into genuine cholera, and so on.

For ready and easy reference we give here the symptoms of HYDROCYANIC ACID which have a direct bearing on the symptoms of the collapse of cholera: Sudden loss of consciousness and sensation, with great weakness. Weakness of whole body, especially of the lower extremities, not subsiding for many days. Cyanosis, lips pale and bluish. Fluid attempted to be swallowed remains in his mouth, ebbing and flowing with the respiratory movements. Great oppression of chest and difficult respiration; gasping as it were for breath. Respiration after long pauses, only seven in a minute, each breath seemed to be the last. Very slow, excessively deep respirations, drawing the ribs to the spine. Slow, laborious breathing, accompanied with a hissing sound or stertor and rattling. Heart's action very weak, irregular with slow depressed pulse; rapid and weak; small and unequal in force, a weak impulse alternating with a strong one. Great paleness of the whole surface; cold clammy sweat over whole body. Spasms commencing in the toes, followed by distortion of the eyes to the right and upward. General spasm, frightful distortion of face; convulsion at first, paralysis afterwards. Suddenly fell down, without either cry or convulsions, breathing deeply forcibly and slowly; or without a trace of pulse or respiration, extremities cold, all the muscles paralysed, but eyes glistening, and as if full of life.

If HYDROCYANIC ACID were prescribed according to the symptoms given above, it would, we doubt not, be more often used than it is. It would be eminently indicated in those cases, by no means small in number, where the collapse is sudden after the first stool or two, the patient becoming blue and his voice husky at once. In such cases we should not wait for the oppression of the chest and the characteristic breathing. Of course where

these are present the indication for the drug would be the more appropriate. It is indicated in cases, where in spite of the use of other remedies, the centres governing circulation and respiration become more and more deeply affected, giving rise to threatening failure of the heart, and deep, slow, gasping respiration. In such cases it would restore life, if the cavities of the heart and the vessels of the lungs are not already clogged with coagula.

Cobra (NAJA TRIPUDIANS) is the most virulent of serpent venoms. Its action upon the nervous system is more profound than upon the blood. Death takes place, in cobra-bites, more generally from asphyxia, that is, from paralysis of the nervous centre governing respiration, than from syncope. In one of our experiments we found the heart was beating after the respiration had stopped for some time, and when the animal appeared to us, to all intents and purposes, to be quite dead, and which in fact led us to lay him open. COBRA again seems to produce or favor coagulation of the blood in the vessels, even in the arteries. We were guided to COBRA in the treatment of the collapse of cholera by the light of these facts, and in the few cases we have tried it (6th dil., globules) we have found it eminently successful. COBRA would seem to fulfil our most sanguine expectations in cases threatened with imminent dissolution from asphyxia, resulting either from extreme nervous exhaustion, or even from embolism of the pulmonary vessels, indicated by great dyspnœa and the most distressing struggle for breath which the cholera-patient in this stage not unfrequently manifests. We would deem COBRA to be especially indicated after ARSENICUM has been exhibited frequently without benefit, or perhaps to the extent of producing this mischief. COBRA seems to be very nearly an analogue of HYDROCYANIC ACID, and acts almost as rapidly and as charmingly.

The following symptoms produced under its action will help in the selection of COBRA: Great depression of spirits; sadness and irresolution; melancholy, broods over possible wrongs and misfortunes, confused memory; loss of consciousness, comatose; vertigo, unable to see, although eyes open. Face very pale, looks haggard and thin; jaws firmly clenched. Speechless and insensible; or unable to speak though conscious. Craving for stimulants which aggravate the state. Nausea, vomited plentifully;

sinking in stomach; great heat in stomach. Rumblings and aching in abdomen. Diarrhœa, sudden, watery, bilious. Respiration extremely laborious; gasping for breath, with several deep-drawn inspirations; respiration hardly perceptible, could only be recognized by the hand on the abdomen. Fluttering of the heart; palpitation; unusual, audible beating of the heart. Heart beats after cessation of the respiration. Pulse weak and thready; hardly perceptible. Prostrate and miserable in body and mind. Torpor and listlessness pervade the whole system; body cold and collapsed; feet and legs cold, hands hot. Extremities cold and corpse-like up to upper part of thighs and arm-pits. Icy coldness affecting first the left side, then at night shifting to the right.

Lachesis: We have no experience with this drug. But from its general neurotic and hæmatic action being analogous with those of the *cobra*, and the neurotic action in both the drugs predominating over the hæmatic, we are inclined to believe that LACHESIS will be equally useful in the particular condition in which COBRA is. We would prefer the latter when despondency and fear of impending dissolution constitute the mental condition of the patient; the characteristic psychical state of LACHESIS being rather excitation than depression.

Properly speaking we have no *foudroyant* or violent effects of the Lachesis poison from the bites of the serpent or from the use of massive or toxic doses, either by the mouth or by hypodermic inoculations. Allen has given some effects or symptoms purporting to have resulted from the bite as recorded by Hering in his *Wirkungen des Schlangengiftes*. But whether the bite was by the Lachesis Trigonocephalus of which he made triturations and dilutions, we have no means of ascertaining. Under the heading *General*, the symptoms—"Faintness and coldness, so that all the limbs became stiff, and he sank to the earth powerless, and died in spite of all remedies,"—are said to have been "from the bite of a serpent 'boschmeister,' similar to the 'surukukir,' in an Indian who had been bitten above the elbow; he followed and killed the snake and rubbed its gall into the wound." How far similar the two serpents, the surukukir (Lachesis) and the boschmeister were, whether they were varieties of the same species, we have no means of knowing. And however similar they might be, we shall not be justified from the homœopathic stand-point

to use the effects of the one as if they were the effects of the other. The symptoms that we give below of Lachesis are those produced by the dilutions, excepting the very few said to have been produced from the bite, and which are so marked.

Loquacious; communicative; excited mood; extremely irritable; remarkable and persistent indifference and forgetfulness; weakness of memory; confusion as to time; mental activity, or rarely indolence; crazy jealousy; mistrustful. Loss of consciousness as before apoplexy; loss of consciousness, with vomiting and purging (bite); loss of consciousness, irregular motions of limbs, cold clammy sweat, pulse small, slow, almost imperceptible, or with complete loss of strength and disappearance of pulse (bite). Vertigo, with reeling and loss of consciousness, as if from threatening apoplexy. Paleness of face with faintness; earthy gray color of face with abdominal troubles. Constant thirst, with dry mouth; longing for wine which does not affect him. Nausea, worse from thinking of it; nausea at 2 a. m., violent vomiting of bile, with vertigo and profuse sweat, from 6 to 9 a. m. diarrhœa; vomiting at night by paroxysms, violently spasmodic, with diarrhœa. Burning in stomach. Sudden diarrhœa, with great urging, offensive; acids, even fruits, after Lachesis, easily cause diarrhœa; watery stools with burning in anus. Shortness of breath and great prostration; difficult respiration; desperate fits of suffocation, she must sit up in bed. Cramp-like pain in precordial region, causing palpitation and anxiety. Pulse small and rapid. Great physical and mental exhaustion. He falls unconscious to the ground, as if struck by lightning, with involuntary stool and vomiting (bite). Obliged to wear the clothes very loose, especially about the stomach, does not lay the arm across body on account of the pressure. Great sensation of coldness, with coldness and longing for fire. Profuse perspiration, staining shirt sulphur-yellow.

There are cases of cholera in which the patients stagger and fall as if struck by lightning and pass stools and vomit unconsciously. Such cases, which almost invariably prove fatal, are likely to be saved by LACHESIS, and by COBRA which has similar symptoms.

Crotalus, though quantity for quantity, is a less energetic poison than Cobra and Lachesis, produces collapse in man and

animals not less violent and profound than either of these. It has its own sphere of action different from those of the allied poisons, and may be selected with accuracy from the following symptoms: Delirium, with convulsions. Depression, and indifference to every thing; melancholy, misanthropic and indifferent, with sudden weakness, headache, heartache, and excessive diarrhœa. Answers disconnected, with cold skin and rapid pulse; remarkable weakness of memory. Vertigo, with nausea, with sopor; pale, earthy leaden-colored face. Articulation indistinct; unable to speak, it seems as though tongue and whole throat were tightly constricted. Extreme nausea and vomiting on the least exertion; unable to retain anything in the stomach; vomiting of food, of bile, of blood. Burning, fulness, and pressure in epigastrium: Diarrhœa, with nausea, anxiety, and thirst; involuntary evacuations; watery diarrhœa, with colic and tenesmus, excessive thirst and repeated attacks of vomiting; slimy and bloody stools in abundance. Urine at first copious, then scanty and seldom. Respiration slow and laborious; gasping, panting; jerking; stertorous; suspended. Much palpitation and trembling of heart, and feeling as if heart jumped out or tumbled over; great diminution of pulse and depression of whole system, threatening collapse; pulse either too frequent or too slow, especially the latter; pulse small, quick, thread-like, or intermittent and very rapid, scarcely perceptible. Along with some delirium and drowsiness, there was no pulse at the wrist, but auscultation showed the heart to be beating about 100 per minute, with feeble impulse, and remarkable shortness of the systo-diastolic impulse. Extremities cold and insensible, body perfectly motionless and covered with cold viscous sweat. Hæmorrhage from all the orifices of the body, eyes, ears, nose, mouth, urethra,—even from beneath the nails. General spasm, without foaming at mouth. Frequent attacks of faintness, with paleness of face, inclination to vomit, and imperceptible pulse.

Dr. J. W. Hayward has observed with reference to CROTALUS: "The sudden and extreme coldness and blueness, the collapse, choleraic state, cramps and diarrhœa and vomiting; embarrassed respiration, scarcely perceptible pulse, suppression of urine, and speedy death or consecutive fever, afford very striking evidence in favor of the use of Crotalus in many cases of, at least sporadic if

not true, Asiatic Cholera." He has gone further and said: "And remembering the vomitings, purgings, and cramps,—the cold surface, shrunken countenance, and choleraic state become very indicative of malignant cholera." Yes, we think the symptoms point more to true Asiatic cholera than to the sporadic form of the disease. CROTALUS would be eminently useful in the hæmorrhagic forms of the disease, where thin blood appears with the stools from the beginning or during the course of the disease, and where the disintegration of the blood is evident from its oozing out from the gums even at this stage.

Ammonia, Alcohol, Ether. In recommending the employment of these agents in the treatment of the collapse of cholera, we might be thought guilty of advocating allopathy under the garb of homœopathy. Our creed is before the profession, and we are fearless of urging the claims of any drug and in any dose, provided we are convinced of its tested or probable utility in the relief of suffering or saving of life. In the present case, however, we are persuaded that in prescribing Ammonia, or Alcohol in any shape, or Ether, we are but acting on the principle of similars. The effect of a pretty heavy dose of any of these agents, is collapse, of the asphyxial or syncopal variety according to circumstances. And compared with the dose capable of producing this effect, the doses ordinarily prescribed for purposes of stimulation are minute, if not infinitesimal.

It is not easy to give the differential indications of these drugs. Ammonia and Ether are more diffusible and act much more rapidly than Alcohol; and therefore are to be preferred when the collapse is more profound. Besides, Ammonia and Ether would seem to be more useful in asphyxial, and Alcohol in syncopal, collapse. These drugs may well act in combination, provided the state of the stomach will permit. Generally it is Ammonia which is less easily retained than Ether or Alcohol. But even this requires to be determined by actual trials. Sometimes Ammonia will be retained when Ether or Brandy will not. It is to be remembered that we recommend the administration of these so-called diffusible stimulants *after* failure of the remedies mentioned before. We have sometimes found homœopathic remedies to act better after the system has been stimulated by them. We

do not say they invariably succeed in bringing on this stimulation. On the contrary they fail more often than succeed, and the best allopathic authorities, as we have seen, such as Drs. Macnamara and McLeod, have come to admit this. We would not therefore advise them to be pushed too far, to the extent of causing distressing irritability of the stomach when, it has already ceased.

But even when the stomach for a time is not rendered irritable, it is not safe to fill it with these powerful agents. "Nothing," says Dr. Edward Goodeve, "is more pernicious than the system of pouring large quantities of brandy into a pulseless patient in cholera. Sometimes when the irritability of the stomach has gone off, he will, in the course of two or three hours, swallow a large quantity of brandy, water, ether, ammonia, sago, wine, &c., and the friends perhaps congratulate themselves upon the quietness of the stomach, the pulse remaining absent nevertheless. In the course of time the patient grows uneasy, and presently vomits the whole accumulation, perhaps two or three pints. Such cases as these show the uselessness of over-loading the stomach in the torpid condition in which the patient is in collapse, and what a reservoir of mischievous elements may be provided against the return of the circulation. .... The irritable stomach is made more so by the drugs."*

The following symptoms of AMMONIA and its Carbonate (a milder preparation) derived from poisonings and provings will show that we are not wrong in looking upon it as a homœopathic remedy in the collapse of cholera: Sad, almost weeping mood; great depression of spirits; low-spirited, apprehensive of evil, especially during cloudy weather; great anxiety, as if she had to die, with cold sweat, audible palpitation of heart, and involuntary lachrymation, audible heavy breathing, and trembling of hand; remarkable timidity; resigns himself to despair; unconscious. Vertigo, with nausea; with cold sweat, as in a fainting fit. Pale, wretched appearance; paleness of face, with nausea, moral and physical weariness; extremely pale face, expressive of the greatest suffering. Very urgent, constant thirst, or constant absence of thirst. Nausea, without vomiting; constant vomiting of mucus; vomiting

*Russel Reynold's *System of Medicine*, Vol. i, p. 79.

of blood; vomiting followed by several stools; copious hæmorrhagic stools; diarrhœa with colic. Scanty, red urine; alkaline urine. Respiration heavy and rattling; harsh, hurried, and obstructed; difficult, quick, stertorous; suffocative fits. Death from asphyxia. Frequent palpitation; beats of the heart, and the pulse so slow and intermittent, that it was difficult to count them; pulse weak, irregular; small, depressed, scarcely perceptible. Great prostration. Bleedings from the mouth, nose, eyes, ears, which cause faintness. The right side is more affected than the left.

The homœopathicity of AMMONIA to the collapse of cholera will be admitted when we remember what Dr. John H. Clarke has observed, namely, that "a condition of *under-oxygenation* underlies a large proportion of symptoms," a condition which prevails pre-eminently in cholera.

When these drugs are useful at all, we have found drop doses to be quite enough. Such doses seldom produce irritability of the stomach, and if tolerated bring about the desired end. AMMONIA is likely to be effective in dilutions, 1st, 2nd, 3rd, decimal.

Beyond the employment of Ammonia, Ether, and Alcohol in various shapes, the old school has hardly anything more to offer in the treatment of the collapse of cholera, unless, indeed, we except Calomel, and intravenous injections of saline solutions. It had become till recently quite a fashion, especially in India, to use CALOMEL frequently and in large doses, in all the stages of cholera. By some practitioners it is said to be attended with uniform success, by others it is looked upon as only falling short of a *catholicon*. And we are advised to push the drug, dose after dose, and consoled with the hope that improvement will ultimately result though none might be apparent, and though the disease might advance and the life of the patient be threatened. This we regard, have found, and therefore must condemn, as not only mischievous but dangerous. The utility of Calomel in cholera depends upon its specific action upon the portal system, combined with its peculiar, catalytic action upon the blood by virtue of which it prevents its coagulability. Hence it has to be exhibited in rather appreciable doses, but not larger than a grain of the 1st, 2nd, or 3rd triturations. Certainly it ought never to be allowed to saturate the system

to its utter and permanent ruin. Falling out of the teeth, cancrum oris, mercurial cachexia have not unfrequently been developed by the injudicious use of this drug in cholera.

When dyspnœa is great; when there would seem to be a sudden failure of the heart's action, or when cramps threaten to stop the machinery of life, the application of *mustard poultices* over the chest may be resorted to with benefit, and should not be forgotten by the homœopathic physician, after his own remedies have failed. I have deemed it my duty to remind my colleagues of the new school of those drugs and measures of the old school which in my early days I had found to be occasionally beneficial, in order that in cases where life is concerned, no stone may be left unturned.

IV.—**The Stage of Reaction** commences with the return of the pulse at the wrist. The pulse at first is very feeble, thready, flickering, but its gradually becoming steady and acquiring volume shows that the reaction will be normal. The respiration from being labored and difficult becomes easier. With the healthy resumption of these two functions, the circulation and the respiration, warmth returns to the surface, displacing the icy, clammy, coldness of collapse. The patient shakes off, as it were, his cadaverous aspect, the shrunken features, the shrivelled livid skin especially of the fingers and toes, are replaced by a healthy appearance of both. The countenance brightens up. The patient loses his despondency and indifference. Hope revives, and he becomes cheerful and displays a healthy solicitude about himself. With reaction the choleraic symptoms may seem to develop anew, but in normal reaction this is only for a short time, and indicates but returning vitality. The purging and the vomiting soon assume a bilious character, the evacuations being yellowish or greenish. The stools gradually become more and more consistent; the urine is secreted, and either voided, or retained as indicated by the fulness of the hypogastric region.

In normal reaction the chief treatment is dietetic, drugs being seldom necessary. The purging and vomiting being rather beneficial than otherwise, should not be checked. Should they, however, threaten to be violent or distressing, remedies must be addressed for their subsidence, and these are generally those

useful in the second stage, only that they should be more cautiously and more sparingly used. We shall consider them when we come to treat of the Sequelæ.

In the stages of full development and of collapse nothing in the shape of substantial diet is admissible. Indeed, nothing but water should be allowed. It is only when reaction has set in that the physician should think of something more substantial than simple water. What that something should be, it would tax his utmost skill to decide. It has been our invariable experience that so long as the secretion of urine has not been established even sago-water may prove injurious. But if we are satisfied from the state of the cerebral functions, from the clearness of the mind of the patient, that the secretion of urine is not in abeyance we may promote it by sago-water sweetened with sugar or slightly salted with common salt. Sometimes it happens that urine has accumulated in the bladder, but not in sufficient quantity to cause the patient to feel an urging or to enable the physician to diagnose its presence. In such cases the patient on being asked has often passed a respectable quantity.

It is when the stools have become bilious that we should think of barley water, or diluted milk, or vegetable soup, or soup of fish or of meat. We have seen the cholera symptoms to return and to jeopardize the life of the patient by the injudicious and premature administration of even barley water as diet. The physician should remember that there is less harm in withholding nourishment than in forcing it when the assimilative power of the stomach has not revived.

Reaction, however, is not always of this normal description. It may be imperfect, and soon fall back into collapse, as if the system had just enough vitality to react upon the disease or to respond to the stimulus of medicine, but not enough to resume and continue its functions. Or it may be abnormal, being followed by congestive, inflammatory, or typhoid condition; the whole system or particular organs, from an inherent weakness, being unable to recover thoroughly from the original shock of the disease or from its subsequent ravages, or, as is not unfrequently the case, being hampered by injudicious medication, take on abnormal action, and thus we have what are known as the SEQUELÆ OF CHOLERA.

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V.—**The Stage of Sequelæ.**—It is usual to consider the Sequelæ under the head of Reaction. But as they are developed after reaction, and as reaction is not necessarily and invariably followed by them, we have formed a distinct stage of them.

The treatment of the sequelæ taxes in the highest degree the judgment and discrimination of the practitioner. Hope is naturally aroused in the mind of the patient as well as of those around, when reaction succeeds collapse. And certainly it is a great disappointment if reaction, instead of being followed by recovery, terminates in death. This would look like a storm-tossed vessel being wrecked when about to be brought to the harbour. It is therefore absolutely necessary that we should be thoroughly acquainted with the pathological conditions which may be developed after reaction is established, not only that we may the better grapple with them, but likewise that we may not be taken by surprise, when an unfavorable result happens.

The sequelæ are the morbid affections or diseases which become developed after the system has recovered from the collapse. They are due either to the ravages of the disease itself, or to the treatment adopted for the subdual of the disease, or to both these causes combined. The forms which they assume are in general the expression of an original, inherent weakness of the organism in all or some of its parts. Thus if the brain has been the weakest organ, it suffers most; if the lungs, they will suffer most, and so on. Or the drugs used might determine the organ which is likely to become most affected. Thus the use of narcotics in excess might cause the cerebral organs to suffer most; the use of astringents might give rise to suppression of the natural secretions; the use of stimulants might determine congestion or even inflammation of the lungs; and so on.

Apart from the shock which the nervous system receives, the most obvious and the most dangerous effect of the disease is the draining away of the water of the blood. The water carries off with it the salts but not the albumen of the serum. The blood, therefore, that circulates in the system, becomes thicker in consistency. This circumstance must greatly interfere with its passage through the capillaries. This is aided by the loss of tonicity of the capillaries themselves, chiefly owing to depression of the sympathetic system. Hence the congestion of all the

viscera is a grand sequela of the disease. This congestion necessarily interferes with the functions of the viscera. Thus the liver fails to secrete the bile, the kidneys to secrete the urine, the stomach to secrete the proper gastric juice, the intestines their own juices, the lungs to aerate the blood, the nervous centres to properly control the parts over which they preside, and so on.

There is, then, more or less congestion in all the organs in every case of cholera; but it is not in every case that congestion in every organ amounts to appreciable disease. One organ or another becomes the seat of diseased action according to its own idiosyncracy, or according to the direction given by treatment.

It is true that the sequelæ of cholera consist chiefly in congestion of the various viscera; but we must remember that this congestion is with an impoverished, and a poisoned blood. The blood is impoverished, having become deficient in some of its essential salts; it is poisoned, having become surcharged with certain constituents which require elimination, but which, owing to the paralysed and congested condition of the organs by which they are eliminated, have not been eliminated by them since the full development of the disease.

The organs that become affected, and which claim our attention for the diseased action lighted up in them, are, very nearly in the order of their importance, the Brain, the Kidneys, the Stomach, the Colon, the Small Intestines, the Liver, the Lungs, the Buccal cavity, the Eyes, the Skin, and the Reproductive Organs.

The most frequent and the most formidable sequelæ are the affections of the Brain and the Kidneys. It is generally supposed that the cerebral derangements are consequent upon and secondary to the suppression of the urinary secretion. We believe however that the brain and the kidneys suffer primarily and simultaneously in the first instance, and that subsequently they react upon each other. The re-establishment of the renal secretion, which opens out a safety-valve for the elimination of the urea and other deleterious products of tissue-waste, very often succeeds in relieving the cerebral organs. Hence, it is that after the subsidence of the violent symptoms, the purging, the vomiting, and the collapse, the first thing that is most anxiously and with just concern looked for, is the appearance of the urine. Nevertheless it is not invariably that the restoration of the functions of the

kidneys is followed by clearance of the cerebral symptoms which may go on increasing to the extent of culminating in death, in spite of copious emissions of urine. This proves one of the three things, either that the brain has been independently affected, or that its derangements have proceeded so far as not to yield to depurating processes going on in the blood, or that the urine secreted is simply the water exuded from the blood, and does not contain its proper constituents.

Next in order of frequency (under ordinary allopathic treatment) though not the next in point of gravity, are derangements of the Digestive Apparatus. Hiccough, retching, bilious vomiting and diarrhœa, tympanites, even gastritis, enteritis, and dysentery, these are the various forms which these derangements assume. Considering the rapidity with which the digestive organs, which have been the focus as it were of the disease, resume their normal state and functions, we are strongly inclined to believe that the gastro-enteric derangements which follow the reaction of cholera are chiefly due to the treatment adopted; and we are confirmed in this view by the fact that these derangements are rare occurrences under homœopathic treatment.

We have next to direct our attention to fever of an adynamic type which not unfrequently sets in after reaction, which, in fact is an exaggerated form of reaction, being only an expression of an abnormal excitement of the circulatory system. This fever may be *sui-generis*, or an accompaniment of congestion of the viscera. The latter, however, may be present without there being any fever associated with it, and *vice versâ*. Nevertheless in treating this fever, it is necessary to institute a searching examination of all the organs, in order to detect any congestive or inflammatory process that may be going on in them.

Asthenia, though not a very frequent, is nevertheless almost invaribly a fatal sequela of cholera. It seems to be a continued imperfect reaction. It is indicative of a most profound depression of the nervous system. The patient, in spite of the food that he takes and apparently digests, not only does not improve, but day by day loses ground, becomes weaker and thinner, till at last he dies as if of inanition. In the course of this, abscesses form in various parts of the body, the corneæ become ulcerated and ultimately slough out. The first sign

of asthenia in a cholera patient is a congestive condition of the conjunctivæ associated with want of lustre in the corneæ, the lower margins of which will be found, on close inspection, to have become whitish, and either already invaded by an ulcer or about to be so. In females, in addition to this state of the eyes, there is very often hæmorrhage from the uterus. The parotid glands seem to be the first to suffer from the suppurative process set up in the economy. Bed sores as a rule are formed on the nates. They also form over the scapulæ. In the worst cases these parts become sloughing and even gangrenous. The mucous membrane of the oral cavity becomes red and ulcerated. The gums become spongy and swollen, and blood may ooze out, and even hæmorrhage takes place from them. Cancrum oris is not unfrequently met with, and most specially in cases where calomel has been largely used.

In the treatment of cholera, in all its stages, but specially in the stage of sequelæ, the practitioner should bear in mind one circumstance which has an important bearing upon the disease and therefore necessarily upon the management of it. This is the probable complication of the disease with the existence of worms in the intestinal canal. This is a most troublesome, and often, especially in young children, a most dangerous complication. In Bengal this is a most frequent complication too. Of late years helminthiasis has figured largely in the statistics of disease of this country. It would seem that hardly any native of Bengal is free from intestinal parasites. A single dose of santonine would, we are sure, expel at least half a dozen of lumbrici from any one's bowels. We do not know to what particular cause to attribute this. We believe it is due to bad drinking water aided by the immoderate use of sweetmeats. It is a notorious fact that water in lower Bengal, whether of tanks or of streams, has sensibly deteriorated. Since the introduction of filtered water helminthiasis has become considerably reduced in Calcutta.

After the above rapid sketch of the sequelæ of cholera, we now proceed to consider their treatment.

As a preliminary to all treatment it is necessary to bear in mind the condition of the blood mentioned before. To enable the vital fluid to supply their proper pabulum to the organs

and tissues, its normal composition must be restored, the water and the salts that it has lost must be supplied. The water is easily supplied, and one of the salts, chloride of sodium, may be best supplied with the food now appropriate, namely, arrow-root, sago, or barley water. These may be agreeably salted, instead of sugared, or sometimes salted and sometimes sugared. The carbonate of soda may be administered in common bottled soda water (a misnomer for carbonic acid water), which will have the additional effect of soothing the irritated stomach. We have seen the introduction of chloride of sodium to have a charming effect. It seems to restore animation to the whole economy, the organs resuming their functions much more easily and rapidly than they would otherwise do. There is a limit, however, beyond which the chloride of sodium and the carbonate of soda will not be tolerated, and it is necessary to closely watch this, that they may not be pushed to the extent of producing mischief.

(I.)—Treatment of the Urinary and Cerebral Derangements.

Almost all the remedies, that are used successfully against the full development of the disease, have, as one of their distinctive pathogenetic effects, suppression of the urine. Hence in the most favorable cases their employment is not only followed by improvement of the chief choleraic symptoms, purging and vomiting, but also by the rapid restoration of the renal secretion. This happy result, however, very seldom takes place in the malignant varieties of the disease, and in these cases we have to stimulate the kidneys to action by other remedies than those employed during the full development of the disease. The remedy upon which homœopathic physicians chiefly rely to bring about this desirable end is—

Cantharis: This drug is useful both in suppression and in retention of the urine; and may be depended upon even when uræmic coma, delirium, and convulsion have taken place.

Terebinthina (turpentine) is another drug closely analogous to CANTHARIS in its action upon the genito-urinary apparatus and may be had recourse to with benefit when the latter has failed to act upon the kidneys.

Spiritus etheris nitrici is the drug upon which allopathic

physicians chiefly rely in suppression of urine in cholera. Though not so frequently successful as the remedies mentioned above, it has sometimes succeeded in cases where the latter had failed, and therefore should not be forgotten by the homœopathic physicians. It need not be exhibited in large doses ordinarily employed. Five drops every 10 to 15 minutes would be quite enough.

If the urine is not secreted under the action of these remedies, or if in spite of the secretion of the urine, the cerebral symptoms do not improve, then we must have recourse to other remedies which have more direct influence upon the brain. *Belladonna*, *Hyoscyamus*, *Stramonium*, *Opium*, *Cannabis*, and *Cicuta virosa*, are the drugs chiefly relied upon. The differential indications of these drugs may be gathered from their pathogeneses. Belladonna, hyoscyamus, and stramonium are close analogues one of the others, nevertheless there are shades of difference in their physiological actions which point to them as remedies in distinct conditions. We employ—

Belladonna, when the condition of the brain is that of active congestion,—when the cerebral derangements are due not simply to irritation of nerve-centres; but to determination of blood to the nerve-centres; when there are blood-shot eyes, fulness and throbbing of the temporal arteries, flushed face, &c.

Hyoscyamus, when the cerebral derangements are mere perverted function dependent upon simple irritation of nerve-tissue without any hyperæmia of the parts.

Stramonium, when the delirium is of the maniacal description, characterized by furor and a great tendency to bite. *Stramonium* seems to stand midway between *Belladonna* and *Hyoscyamus* in causing determination to the encephalic centres, but above all in producing irritation of nerve-substance.

Opium is best indicated where there is great depression of the cerebral centres, more coma than delirium, and when there appears to be absolute insensibility to the action of medicines.

Of Cannabis Indica we have no pathogenesis in the *Materia Medica Pura*. We have employed it with success in cases characterized by a comatose condition, mild delirium, and involuntary itching of the body, especially of the genitals—a peculiarity we have invariably found in hemp-smokers of this

country. If ever that peculiar condition, known as catalepsy, be developed, *Cannabis Indica* would be the best remedy for it.

Cicuta virosa is very useful in cases characterized by sopor, convulsions, and staring or up-turned eyes. We should have said before that *Cicuta* is also useful in the stage of full development of the disease, of the spasmodic variety, especially when the pectoral muscles are the seat of the spasms, so as seriously to compromise the respiratory function. *Cicuta* would be particularly useful when worms are the cause of the nervous symptoms.

(II.)—Treatment of the gastro-enteric derangements.

Hiccough is one of the most troublesome of the gastric derangements, but fortunately we have in the homœopathic materia medica a host of remedies which cover this symptom. We can indicate only a few of the most prominent of these—to give the indications of all would require more space than we can afford to spare.

Belladonna, for repeated attacks of violent hiccough; for hiccough which causes the patient to start up from bed, and makes him deaf till the next paroxysm; for nightly hiccough with sweat; and for hiccough that is followed by convulsions of the head and limbs, which again by nausea and lassitude.

Cicuta, for sounding, clangous hiccough.

Hyoscyamus, for hiccough with spasms and rumbling in the abdomen, or with involuntary micturition and foam at the mouth.

Carbo veg., for hiccough during every motion.

Agnus, for hiccough with ill humour.

Pulsatilla, for hiccough with suffocative paroxysms, for hiccough during sleep, or after drinking or when smoking.

Staphysagria, for frequent hiccough attended with nausea and stupefaction.

Phosphorus, for hiccough after eating, so violent that the pit of the stomach feels sore and aching.

Ignatia, for hiccough after eating or drinking.

Sulphur, for hiccough with pain behind the palate.

Besides the above we must particularly consult *Aconite*, *Arsenic*, *Bryonia*, *Cuprum*, *Lachesis*, *Nux vom.*, *Veratrum*, and *Zincum*. Cases will turn up which will prove so obstinate as to resist even the most nicely-selected remedy. Under these circumstances we

must not forget the application of mustard plasters to the epigastrium, the exhibition of chloroform in doses of 5 drops every 15 to 30 minutes, and even the hypodermic injection of morphia. It will so happen that when the homœopathic remedies taken by the mouth fail, they will succeed when introduced into the system by the hypodermic syringe.

If in spite of the above measures the hiccough continues, we may be almost sure that it depends upon the presence of worms in the stomach. If the patient's strength would permit we should try to expel them, and the best means of doing this would be to encourage vomiting by draughts of tepid water slightly salted. If this cannot be done we should try *Cina*, lime-water with milk, or even santonine.

NAUSEA AND VOMITING are another set of troublesome affections. They are the expression of an abnormal irritability of the stomach depending, in the great majority of cases, upon an excessive secretion of its own juice, as well as upon the regurgitation of the hepatic secretion into it. Hence the matters vomited in this stage are acid and bilious. In such cases *Ipecacuanha* and *Nux vomica* are quite competent to effect a cure. *Ipecac.* is preferable when nausea simply prevails, *nux* when along with nausea there is vomiting. *Ipecac.* failing may be followed by *nux*, and *vice versâ*. When both these remedies fail *podophyllum* is likely to be of service. When vomiting has this peculiar characteristic that it takes place immediately after each draught of cold water, *Eupatorium* is the remedy. When the water drunk is thrown up after it has lain some time, so as to become warm, in the stomach, we should try *Phosphorus*.

If notwithstanding the exhibition of the previous remedies, the vomiting continues to be distressing, we should not hesitate to try *Carbonate of soda* with soda water, which will have the double effect of neutralizing the excessive acid secreted in the stomach, as well as of soothing its irritated nerves. In very bad cases *Hydrocyanic acid* should be thought of. The exhibition of chloroform internally, and counter-irritation with it externally over the epigastrium, are often, in very intractable cases, attended with benefit. We believe both hydrocyanic acid and chloroform act on the homœopathic principle, though as yet we are not in possession of their full length pathogenesis to enable us to select them

as we do other attested homœopathic remedies. But on whatever principle they may act, this is certain that they act beneficially in the conditions for which we have recommended their use, and the interests of our patients require that we should not neglect them.

When the vomiting is the expression of an inflammatory or sub-inflammatory condition of the stomach we should treat it as such.

Diarrhœa, after reaction has fairly set in, very seldom leads to fatal consequences. A slight diarrhœa is, in our opinion, beneficial until the functions of the kidneys are established; we must not, therefore, be too officious to check any diarrhœa that might be lingering on after the violence of the disease has subsided, so long as no urine is secreted, the intestinal discharges being not unfrequently vicarious of the renal secretion.

We must, however, attend to the diarrhœa if it continues after the establishment of the urinary secretion, or even before that, if it is found to be exhausting, exercising a depressing influence upon the pulse. In the latter case a return to the use of the remedies that were employed during the full development of the disease is likely to be attended with benefit, the dilutions used being higher. Should this fail we should at once address our remedial agents chiefly to the kidneys and we shall find to our astonishment that the urine has been secreted, at the same time that the diarrhœa has been checked.

For the diarrhœa that continues after the restoration of the renal secretion, the best remedies are *Phosphoric Acid*, *China*, *Ferrum* and *Podophyllum*. We use the last-named drug when the discharges indicate an excessive secretion of bile, that is, great irritability of the liver. For Phosphoric Acid, China, and Ferrum no particular indication can be given. Failing with one we use either of the others. We always begin with Phosphoric Acid. It is very seldom that the above remedies disappoint us, but should they do so, we should not hesitate to use massive doses of the so-called astringents, such as Gallic Acid, Tannic Acid, Acetate of lead, Chalk, and even Opium.

Tympanites is most distressing, and if unchecked may, by interfering with the play of the diaphragm, prove a most dangerous complaint. Tympanites is distension of a portion, or of the

whole, of the alimentary canal with gas. The generation of gas in the canal is due to decomposition of its contents, favored by either defective or morbid secretion, and want of tonicity of its muscular coats; or gas may be secreted by the walls of the canal. The treatment of tympanites will, therefore, consist in causing the re-establishment of the secretions that are altogether wanting or defective and correcting those that are morbid, in imparting tone to the canal, and if need be, in causing evacuation of its offending contents.

The remedies that have been found useful in the affection, especially as a sequela of cholera, are *Nux vom.*, *Mercurius*, *Sulphur*, *Carbo veg.*, and *Lycopodium*. We prescribe—

Nux vom. generally when the distension is due more to torpor of the bowels than to any defect or morbid character of their secretion. It is particularly useful when the distension is chiefly in the stomach, also when there is defective inpouring of the hepatic secretion into the intestines from torpor of the gall-bladder and of the biliary ducts, in other words, when there is *biliary* congestion.

Mercurius when the distension is due to defective secretion from the liver, and when along with this there is fœtor in the mouth.

Sulphur when there is defective secretion of the whole alimentary tube, depending upon venous congestion of its mucous membrane. Sulphur is especially useful where Mercurius has failed, or where much mercury has been used in the treatment of the disease.

Carbo vegetabilis when we have to correct morbid secretion. "It is most suitable for cases where the gas is generated by the walls of the viscera rather than from fermentation of the ingesta; where it distends the stomach rather than the intestines; and where the tendency is to diarrhœa rather than to constipation." —(*Hughes.*)

Lycopodium: This drug vies with Carbo in its power to correct foul secretions. It is particularly applicable when the distension is in the intestines and when there is constipation.

Failing with the above remedies we may think of *China*, *Asafœtida*, *Capsicum*, and *Camphor* in dilutions, say 3x.

Sometimes an enema of warm soap-water with a few drops

of turpentine, or soap-water with a few drops or two of Tincture of asafœtida, with or without castor oil, affords remarkable relief by evacuating the contents of the lower bowels, and should not therefore be neglected. Enemas, however, should never be used in cases of extreme prostration, because then they are retained, the bowels having no power to re-act upon them, and thus add to the mischief already existing.

The application of cold wet-sheet over the abdomen greatly assists in reducing the tympanites, probably by condensing the gases within, and perhaps also by acting upon the nerves of the intestines, through the cutaneous nerves of the abdomen.

Acidulated drinks are both agreeable and useful. We prefer lime-juice to other acids. In tympanitic conditions sugar is best avoided. Toast water probably for the charcoal it contains is useful. Brandy may be allowed.

The inflammatory conditions of the various tracts of the digestive tube are attended with more or less fever, and are therefore best considered under the treatment of the fever.

(III.)—Treatment of the Fever.

When this fever is simply an exaggerated form of reaction, due either to the free use of stimulants during collapse, or the inherent sensibility of the organism, we may expect it to subside of itself. If it would not, a dose or two of Aconite would help it to do so. It is not always, however, that we have this favorable termination of the febrile movement that sets in after reaction. Generally we have to contend against a most obstinate, low form of fever, very little differing from the genuine typhus or typhoid.

The fever that succeeds reaction is generally in association with congestion or even inflammation of some one or other of the important viscera. It is absolutely necessary, therefore, to arrive at a correct diagnosis, in order to successfully combat the disease.

If it is the Brain that is affected, we shall generally succeed with *Belladonna*; if the Lungs, with *Bryonia* and *Phosphorus*; if the Stomach, with *Arsenic*, *Nux vom.*, *Bryonia*; if the Small Intestines, with *Mercurius sol.*, *Bryonia*; if the Liver, with *Merc.*, *Bryonia*, *Nux v.*; if the Colon, that is, if we have Dysentery, with *Mercurius corrosivus*, *Nux vom.*, *Ipecacuanha*, *Carbo veg.*;

if the Urinary Apparatus, with *Cantharis.* In all cases, when the febrile excitement runs high, we premise the treatment with *Aconitum.*

When the fever is uncomplicated *Rhus tox* and *Phosphoric acid* are the principal remedies. *Phosphoric acid* and *Rhus* are also very good for cerebral and pulmonary complications.

The application of cold water by the wet-sheet to the head, the chest, and the abdomen greatly tends to the subdual of the inflammatory condition of the organs which they enclose. The application of cold water to the head is already in vogue, and in fact, in the eyes of my countrymen, distinguishes European treatment from that pursued by indigenous practitioners, the Kavirajs and Hakims. But the application of cold water to the abdomen and chest for inflammation of their enclosed organs has not yet been recommended. On the contrary, the application of the cold-sheet to the chest for pneumonia, &c., is still looked upon with horror, just as the Kavirajs still look upon the application of cold to the head in inflammations of the brain and meninges. We can speak from personal experience of the great benefit and the immense relief afforded by these local applications.

(IV.) Treatment of the Asthenia.

The Asthenia that we have described above as constituting a sequela of cholera is the most formidable condition of the system that we have to contend against. It is the most to be dreaded inasmuch as it indicates such an utter prostration as to baffle all sorts of treatment, and all our remedial agents. The very fountains of life seem as if dried up. Medicines do not act, simply because there is not vitality enough in the organism to react upon them. Nevertheless such cases are not to be neglected and given up as absolutely hopeless.

The best remedy that we know of, in this condition, is *China.* It is singular that when we were ignorant of the Hahnemannian system, we used to derive the greatest benefit from Quinine. And we now find that when China fails Quinine succeeds, and *vice versâ. Phosphoric acid, Carbo veg.*, and *Rhus tox.* would deserve a trial when *China* fails. *Arsenic* (high dilutions) and *Moschus* should be thought of, when nothing succeeds, and when the fear of death is great.

When suppurations take place *Hepar sulph.* and *Silicea* are the remedies that do great service. *Silicea* seems to be especially useful after the abscesses have burst or have been opened. In inflammation and suppuration of the parotid glands, *Lachesis* is the remedy. *Belladonna* and *Rhus* deserve a trial just at the commencement of the swelling. When after the use of *Lachesis* the discharge still continues, *Silicea* should be used. *Mercurius*, unless massive doses of mercurial preparations have been previously used, would also be an appropriate remedy.

When the bed-sores become gangrenous, *Lachesis*, *Arsenic*, and *Carbo veg.* should be employed according to their indications. The best local application is Arnica or Calendula lotion or ointment. If there be much fœtor Carbolic Acid would form a good dressing, with water, or better with glycerine or sweet-oil. Charcoal poultices are also of use.

For ulcerations of the mouth the best remedy is *Nitric Acid.* When there is much bleeding from the gums and when it resists the action of *Nitric acid*, *Carbo veg.* and *Hepar sulph.* should be thought of. Arnica gargle would be highly useful. When the bleeding is profuse and would not be checked by the above means, local application of Tannic Acid, Turpentine, or the Tincture of Steel should be had recourse to.

For canerum oris, the best remedies we have found are *Aurum*, *Silicea*, *Hepar sulph.*, *Sulphur*, *Quinine*, and *Tincture of Muriate of Iron.*

When the eyes become congested and the corneæ ulcerated, *Pulsatilla* has appeared to us to be the best remedy. We should not forget that this condition is but the expression of the general asthenia and can only be corrected by remedies addressed to the whole constitution. We should not, therefore, in obedience to the ignorant demands of the friends of our patients, put any irritating lotions or drops into the eyes. Much mischief, and never any good, is done in this way.

LIST OF REMEDIES USED IN CHOLERA.

ARRANGED ALPHABETICALLY.

[N. B.—The relative importance of the remedies is indicated by the typography.]

ACIDUM HYDROCYANICUM, 6.
Acidum Nitricum, 3, 6.
ACIDUM PHOSPHORICUM, 3, 6.
ACONITUM, 6, 30.
ANTIMONIUM TARTARICUM, 3, 6.
ARSENICUM, 6, 12, 30.
Asafœtida, 6.
BELLADONNA, 6, 30.
BRYONIA, 6, 30.
CAMPHORA, (Saturated Tinct.), 3.
Cannabis Indica, 6.
Capsicum, 6.
CARBO VEGETABILIS, 6, 30.
Chamomilla, 6, 12.
CHINA, 6, 30.
Cicuta Virosa, 6, 30.
Cina, 3, 6.
COBRA, 6, 30.
Colocynth, 6.
Croton Tiglium, 6.
CUPRUM, 6, 30.
Elaterium, 3, 6.
Eupatorium.
Ferrum, 6, 30.
Hepar Sulphuris, 6, 30.
HYOSCYAMUS, 6, 30.
Iris Versicolor, 3, 6.
JATROPHA CURCAS, 3, 6.
LACHESIS, 6, 30.
Lycopodium, 12, 30.
Mercurius Corrosivus, 6, 30.
Mercurius Dulcis, (Calomel.)
Mercurius Solubilis, 6, 12, 30.
NUX VOMICA, 6, 12, 30.
Opium, 6, 30.
Podophyllum, 6, 12.
Pulsatilla, 3, 6, 30.
RHUS TOXICODENDRON, 6, 30.
SECALE CORNUTUM, 6, 12, 30.

Silicea, 6, 12, 30.
Stramonium, 6.
Sulphur, 6, 12, 30.
Tabacum.
VERATRUM, 3, 6, 30.

List of Remedies arranged according to the Stages in which they are used.

I.—Premonitory Stage.

Acidum Phosphoricum.
Aconitum.
Arsenicum.
CAMPHORA.
Carbo Vegetabilis.
Chamomilla.
China.
Ipecacuanha.
Nux Vomica.
Phosphorus.
Pulsatilla.

II.—Stage of Full Development.

Aconitum.
Antimonium Tartaricum.
ARSENICUM.
Camphora.
Croton Tiglium.
CUPRUM.
Elaterium.
's Versicolor.
opha Curcas.
urius Corrosivus.
ercurius Dulcis, (Calomel.)
SECALE CORNUTUM.
Tabacum.
VERATRUM.

III.—Algide Stage or Collapse.

ACIDUM HYDROCYANICUM.
Aconitum.
ARSENICUM.

Camphora.
CARBO VEGETABILIS.
Cicuta Virosa.
COBRA.
Cuprum.
Secale Cornutum.
Lachesis.
VERATRUM.

V.—Stage of Sequelæ.

ACIDUM PHOSPHORICUM.
Acid Nitricum.
Aconitum.
Arsenicum.
Asafœtida.
BELLADONNA.
BRYONIA.
Camphora, 3.
Cannabis Indica.
Capsicum.
Carbo Vegetabilis.
CHINA.
Cicuta Virosa.
Cina.
Eupatorium.
Ferrum.
Hyoscyamus.
Lachesis.
Lycopodium.
Mercurius Solubilis.
Mercurius Corrosivus.
NUX VOMICA
Opium.
Podophyllum.
Pulsatilla.
Rhus Toxicodendron.
Stramonium.
SULPHUR.

LIST OF REMEDIES THAT MAY BE REQUIRED IN MASSIVE DOSES AS ADJUNCTS IN THE TREATMENT OF CHOLERA.

Acetate of Lead.	ETHER, Chloric.
ALCOHOL,—Brandy and Wines.	ETHER, Nitric.
AMMONIA.	ETHER, Sulphuric.
CARBONATE OF SODA.	GALLIC ACID.
Chalk.	OPIUM.
CHLOROFORM.	QUININE.

EXTERNAL APPLICATIONS.

Chloroform. Mustard Plaster. WET-SHEET (Local).