

## ORIGINAL PAPER

# A proving of *Hydrophis cyanocinctus*★

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The proving carried out in 1958 on the venom of the sea-snake *Hydrophis cyanocinctus*, resulted from a number of papers published in the *British Medical Journal* by Dr. H. A. Reid, Specialist Physician at the General Hospital, Penang, Malaya. These articles on sea-snake bites were noticed by Dr. Twentyman who asked Mr. Everitt of Nelson's to obtain some venom. This was done with the help of Dr. Sankaran of Bombay. Of the numerous species of sea-snake it was a *Hydrophis* which was obtained, its venom extracted and the dead snake sent to London for identification. It was from this venom that potencies were obtained which were used in our proving.

Dr. Reid's papers were published in the *British Medical Journal* on July 14th, 1956, July 6th, 1957 and November 30th, 1957. In these articles he describes and discusses sea-snakes generally and the effects of the bite particularly. His information is largely original, resulting from a survey of bites on Malayan fishing villages. He gives a detailed account of the clinical picture of various bites and tabulates the symptoms and signs. Incidentally some of these were his own symptoms when accidentally bitten, and he records that the effects of the treatment were much worse than those of the snake-bite! The poisoning symptoms lasted four days, and the treatment effects lasted for one year!

## Sea-snakes

Sea-snakes appear to be very numerous on the seas of South East Asia, around India, Malaya, China, Australia and the Pacific Islands. They seem to live near the coasts and especially around the river mouths, but their natural history is still incomplete.

They feed on fish and eels, which they hunt by day and night, and are in turn eaten by sharks and certain birds, e.g. sea eagle.

The majority of land snakes lay eggs but sea-snakes and water snakes are viviparous, having between 2 and 18 young during March and April. The various species differ in colour and size, but all have in common a flat paddlelike tail. The *Hydrophis* is olive yellow with black stripes or bands. The commonest species is the *Enhydrina schistosa*, but the *Hydrophis* is very common, and amongst the largest of the sea-snakes, growing up to 9 feet in length.

Although highly poisonous they are fortunately not aggressive creatures, so that bites seem to be the result of a chance encounter.

In some parts of Asia sea-snakes are caught for their skins, and they are eaten by the Chinese, who also use them as a treatment for rheumatism.

*The venom* is more potent than that of the Cobra, but experimentally less toxic than *Enhydrina schistosa* venom. It has a neurotoxic effect upon the respiratory centre and on the motor nerve-ends, but no direct action on the vasomotor centre, heart or blood vessels, and no hsemolytic or coagulation effect.

Thus we have, in the three genera of snakes, the following toxic effects:

Hydrophiidae (sea-snakes)	Neurotoxic.
Elapidae (Elaps, Naja)	Neurotoxic. Cardiotoxic. Hæmotoxic.
Viperidae (Lachesis, Crotalus)	Hæmotoxic.

The bite is usually in the limbs, especially the foot. It is painless after the initial puncture, and symptoms begin minutes to hours after the bite.

*The symptoms* are due to bulbar and motor paralysis, usually generalized to begin with, or ascending rapidly from the legs. Aching pains or stiffness on moving is usually the first symptom, followed by flaccid paralysis of the limbs and trunk. The muscles are tender, the jaws are stiff and the eyelids droop. The throat is dry and burning but there is general coldness of the body and increased sweating. Victims are mentally quite clear with some apprehension and insomnia. In fatal cases, as paralysis progresses, respiratory failure ensues with cyanosis and hypertension and sometimes convulsions. Death occurs hours or days after the bite, depending on the severity, or in less severe cases recovery will be complete in days or months.

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Dr. Reid describes a representative fatal case whose symptoms and signs *in order of appearance* were as follows:

- Dry feeling in the throat, with dysarthria.
- General ache in the proximal limbs.
- Stiffness and pain in the lumbar region.
- Weakness of muscles in the limbs and back.
- Dysphagia.
- Insomnia (mentally clear).
- Numbness of the fingers.
- Ptosis and Trismus.
- All the muscles were tender.

Examination revealed:

- Dilated pupils.
- Increased tendon reflexes but loss of plantar response.
- Generalized paresis.
- No loss of sensation.
- No loss of sphincter control.
- Normal blood picture.

Later symptoms which developed may have been, at least partly, due to treatment with antivenenes, cortisone and penicillin:

- Abdominal pains and vomiting.
- Increased sweating and pyrexia.
- Loss of tendon reflexes.
- Dyspnoea and cyanosis.

In the survey of 125 cases of sea-snake bite Dr. Reid lists the symptoms *in order of frequency* thus:

- Paresis.           Dysphasia.
- Trismus.         Numbness.
- Breathing changes   Dry throat.
- Dysphagia.                 (vomiting)
- Ptosis (cyanosis).         (cheek swellings)
- General stiffness         (convulsions)
- (increased sweating).     (facial palsy)
- GENERAL COLDNESS     (difficult cough)
- Thirst                     (unconsciousness)
- Red or black urine.       (drowsiness).

Tender muscles are not listed but it is a common symptom. The symptoms in brackets are uncommon in *non-fatal* cases, and general coldness is more frequent.

Recovery may take place even in patients who are totally paralysed, and when recovery does take place it is complete as there are, apparently, no permanent after-effects.

## The proving

Our proving of the sea-snake was conducted from January–June, 1958, with 14 people, 10 of whom took the drug and 4 who were controls taking lactose. Of the actual provers of the drug, 8 were men, 2 women. They took the 6c potency *Hydrophis* from mid-January until mid-April and from then on the 30c potency. During the last few weeks the provers and controls were interchanged, but this did not have the desired effect of showing symptoms in the controls, at least it was not sufficiently obvious. It was a double-blind experiment with neither the provers nor myself knowing the drug, or who was taking what. However, it soon became obvious, as one prover after another stopped the powders, complaining bitterly, and having to be persuaded to restart the experiment. Some could not be persuaded!

The symptoms produced by this drug were, on the whole, clear and impressive, with a conformity which was almost completely absent in the controls. Strangely enough some of the controls had night starts and even sore throats, but a glance through the books shows at once which is “prover” and which control.

Only one prover did not have outstanding symptoms and he was the oldest of the group, 49 years. The two who had the most severe reactions were both tall dark-haired men of rather flabby build. This is hardly significant in such a small series, but it did strike me at the time as they looked rather alike.

When we now compare the proving symptoms with the symptoms produced by the sea-snake bite, we must bear in mind that the bite symptoms are those produced by at least seven species of sea-snake, and perhaps more than seven. Indeed only 10 of 65 bites recorded in one series of Dr. Reid’s cases were from *Hydrophis cyanocinctus*.

It seems highly unlikely that a large series of *Hydrophis* bites will ever be collected, because the offending snake is not always seen, far less identified. Most of the victims are fishermen who are not always able to distinguish the species and much of their fishing occurs at night. About one-third of the bites occur at night.

*1st and 2nd Degree Symptoms from Hydrophis Cyanocinctus 6c and 30c*

MIND	<p>DEPRESSION—Cheerful on first day of powders, "feel better than ever". Weeps from depression &gt; alone, &lt; consolation. Melancholic (sadness for no reason). TIREDNESS. <i>Lethargy.</i> <i>Forgetful.</i> <i>Can't concentrate.</i> Irritable. Lack of initiative (no joy in life). Drowsy.</p>
HEAD	<p><i>Dull headache</i> &lt; L, &lt; frontal, &lt; a.m., &lt; heat, &gt; open. <i>Heavy head.</i> Throbbing head. Tight band round head. Sudden headaches. Itch of scalp. Vertigo.</p>
EYES	<p>BURNING OF EYES &lt; L. Tired eyes, heavy eyes. L. eye blurred vision. Vision disturbed. Stye L. eyelid. Itch L. eyelid. Pain in L. eye.</p>
EARS	<p>Pain L. mastoid. Deaf in L. ear. Pain in L. ear.</p>
FACE	<p>Nasal catarrh (burning) &gt; open. Pain in L. face.</p>
MOUTH	<p>Toothache L. molar. Dry mouth &lt; a.m. Pain in L. jaw. Cannot chew properly.</p>
THROAT	<p>SORE THROAT. DRY THROAT. Burning in throat. Hot <i>dry pharynx</i>. Pain in tonsils. &lt; L. side, &lt; waking, &lt; before M.P., &lt; talking.</p>
STOMACH	<p><i>Nausea.</i> <i>Thirst</i> for cold drinks. Gnawing pain R. hypochondrium p.c. Pain in epigastrium p.c.</p>
ABDOMEN	<p>Sharp pains. Shooting pains. Stitching pains &lt; L. Colic &lt; L. Pains &lt; morning. Tightness round abdomen.</p>
RECTUM	<p><i>Itch in anus.</i> Pain after stools (burning and sharp). Constipation. Hæmorrhoids, painful and swollen.</p>
URO-GENITAL	<p>M.P. excessive. Heavy M.P. Red vaginal discharge.</p>
LARYNX	<p>Hoarseness &lt; talking &lt; morning.</p>
COUGH	<p><i>Cough from dry throat.</i> Tickle in throat.</p>
CHEST	<p>Stabs of pain in Heart and L. Chest &lt; lying down. Dryness and burning in chest. Palpitation &lt; on waking. Dyspnoea.</p>
BACK	<p><i>Pain in back</i> &lt; L.</p>
EXTREMITIES	<p><i>Spot pains</i> in thumb and arm &lt; L. Stabs of pain in limbs. Pain in L. hip. Cold feet (hot feet). <i>Numbness, weakness, heaviness</i> in legs and arms.</p>

SLEEP	<p>WAKING AT NIGHT FROM DREAMS, with fear, feeling ill, hot.  <i>Waking early in a.m., 2.30-4.30 a.m.</i>  <i>Light sleep.</i>  <i>Insomnia.</i>  <i>Restless sleep.</i>  <i>Shouting in sleep.</i></p>
PERSPIRATION	<p>Excessive (without fever).</p>
FEVER	<p>During colds and sore throats.</p>
SKIN	<p>Dry cracked skin on hands.          Spots on face and neck.          Itch of the skin in various parts.</p>
GENERALITIES	<p><i>Tiredness.</i>  <i>Heaviness &lt; on waking.</i>          &lt;a.m.          &lt;L. side.          Pains sharp (except head).          Burning.</p>
KEY NOTES	<p>Depression, tiredness, and heaviness.          Dull frontal headache.          Burning dry throat.          Stabbing pains in Limbs, Abdomen, Chest and Heart.          Night starts or nightmares.          &lt; L. &lt; a.m. especially on waking.</p>

However, one presumes that the sea-snakes have all similar toxic effects from their bite, and that the symptoms recorded by Dr. Reid apply on the whole to *Hydrophis cyanocinctus* also. He does not differentiate in his case histories, which symptoms were produced by which snake.

The most striking comparison is in the mental symptoms, viz.:

Sea-snake bites . . . .	<p>Mental clarity.          Insomnia.          Apprehensive.</p>
Proving symptoms . . . .	<p>Marked depression.          Weepy.          Tiredness.          Forgetful.          Can't concentrate.          Irritability.</p>

This, of course, may only be a demonstration of the primary and secondary effect.

*Headaches* were a very common feature in the provers, but not mentioned in the bites.

Needless to say we had no paresis in our provers, but prover No. 11 had a feeling of weakness in the limbs and general lifelessness as if going to die. Three other provers had weakness of their limbs, and heaviness of the body, which is probably the nearest subjective sensation to objective paresis.

The hot, dry, burning mouth and throat, with thirst, was a striking symptom in the provings, and occurs in the bites.

In addition dysphagia, ptosis, sweating, coldness, numbness and muscle pains all occurred in some form in the provers. If we read through the early symptoms of the fatal case almost all of them are found in the provers. So that the similarity of these two groups of cases is strongly marked in all things but the mental and head symptoms.

In considering the possible uses of this obviously powerful drug, one is immediately struck by the similarity of the symptoms of the snake bite to those of *poliomyelitis*. The muscle pains, weakness, stiffness and ascending paralysis are symptoms both of an early *poliomyelitis* and of a bite. However, the snake when it does not prove fatal is completely overcome, leaving no residual paralysis or weakness or wasted muscles, such as may remain after *poliomyelitis*. So that the snake bite is more a picture of an early acute *poliomyelitis* than of a later stage.

Comparing it with the picture presented by poisoning with *Lathyrus sativus*, it is clearly more dramatic. *Lathyrus* poisoning is usually a more subacute disease, and it has tremors of the limbs, tinnitus and incontinence of urine, none of which occur in *poliomyelitis*. The wasted muscles also point more to a late stage of *poliomyelitis*.

The drug picture of *Hydrophis* resembles the other snakes, especially *Lachesis*. Although it lacks loquacity, it has a strong left-sidedness, morning aggravation and the throat symptoms. It has also the "tight band" feeling, and palpitations, but no hot flushes. One or two provers developed spots on the skin but that hardly justifies it as a remedy for sepsis. Strangely enough it seems to affect the blood, as both female provers reported excessive M.P. and one had a red vaginal discharge. One prover woke in the middle of the night with a nosebleed.

To sum up, one could say that *Hydrophis* resembles *Lachesis* very much, but instead of the blood and circulatory conditions, it affects much more the peripheral nerves. It shares the sore throats as a prominent symptom, but it more noticeably affects the limbs with heaviness, weakness, numbness, and sharp stabs of pain.

I would like to thank Dr. Bodman and Dr. Blackie for their very helpful advice during the months of this proving, and to thank Mr. Everitt and Mr. Ainsworth of Nelson's for their technical advice and help.

## Appendix

<i>No. 1. Prover</i>	<i>M.S. 26 years</i> Fair haired, well built young woman Pycnic type No relevant past history
MIND	<b>Tiredness, Forgetful, Depressed</b> !! "Cheerful on first day of powder" !! Disgruntled, lethargy, < before M.P. Irritable, tearful > alone, < consolation "Had to drive myself to study"
HEAD	Vertigo on rising < a.m. < evening Headache R. > quiet H.L. → L. face, < a.m. H. back of head, < a.m.
EYES	Cyst of left eyelid. (old symptom returned) Blurred vision of L. eye suddenly in afternoon. Improved gradually Twitching of eyelid—L. upper
FACE	R. and L. nostril blocked, > open
NOSE	Cold sore L. lip, lower Hot red swelling of R. cheek Sneezing on waking
THROAT	Coryza, > open air, < stuffy room <b>Burning in throat.</b> < p.m. on lying < L. <b>Sore throat</b> L. on waking < swallowing <i>Hot dry pharynx</i> Dry throat, < before M.P. <i>Thirsty</i> during a cold. Desire for cold drinks
STOMACH	Nausea < smell of food Heavy ache in abdomen in p.m.
RECTUM	Severe haemorrhoids. Painful < R. → buttock and leg > lying, > pressure, < B.O., < movement, < touch, < a.m.
URO-GENITAL	Heavy M.P. Pass urine at night
COUGH	<i>Cough from dry throat</i>
CHEST	Spot pain L. chest in bed Suffocation < lying down Sharp pain L. chest on swallowing
EXTREMITIES	Weakness in legs Small spot of pain in leg. R. < walking Hot feet at night in bed.
SLEEP	Woke at 3.30 a.m. from nightmare. (Being attacked) Night starts Restless at night Shouting in sleep
FEVER	Feels warm during coryza.
<i>No. 2. Prover</i>	<i>R.R. 32 years</i> Dark haired medium built man. <i>Past history</i> dyspepsia
MIND	<b>Depressed</b> (began on 6th day) <b>Heavy, Irritable, Lethargic</b> Moody, forgetful, inactive Sad thoughts, singing sad songs No joy in life. (No reason for sadness) Must drive myself, lazy
HEAD	<b>Heavy head</b> < L.> open < movement < sun < cm waking <i>Dull headache</i> Frontal headache < L. Hot head during coryza
EYES	<i>Difficulty in focussing eyes</i> Hot stinging sensation in eyes Eyes heavy <i>in a.m.</i> can't open them Eyelid itchy < L. Pain in L. eye
EARS	Pain in L. mastoid
MOUTH	Pain R. lower wisdom tooth
THROAT	<i>Pain in tonsil R. and L.</i> (1st day) <i>Sore throat</i> < talking

STOMACH	Lines of pain in neck and throat <b>Gnawing pain r. hypochondrium &lt; eating</b> < 3 p.m. (old symptom), > heat, N.v. 6 (Nux vom. 6). <i>Nausea</i> and disinclination for food.
ABDOMEN	<b>Stitching pains</b> < L. <i>Shooting pains</i> and hunger pains Vague pains Fluttering in abdomen
RECTUM	General colic all over abdomen < L. < a.m. <i>Pain after stool</i> — <i>sharp</i> , burning < R. → buttock
URO-GENITAL	Constipation. Pain → L. testicle (from abdomen). Pain in groin R. testicle
CHEST	Pain between shoulder blades < L. Pain L. lower ribs
EXTREMITIES	<b>Spot pain R. and L. Thumb joints &lt; L.</b> Pains R. arm with weakness. Pains L. Hand—sudden. Pains L. wrist with weakness—stabs. Cramp R. leg. Cold feet during coryza.
SLEEP	<i>Waken early 5 a.m.</i> Wakened at 5.30 a.m. Can't get off to sleep again.
SKIN	<i>Dry cracked fingers</i> and hands. Bleeding, scaling, eruption. Itch of skin in various parts
GENERALITIES	Heaviness < on waking < on waking < a.m. < L. side (14 symptoms)

<i>No. 3. Control.</i>	<i>M.L. 25 years</i> Dark haired girl from South Africa First visit to England Upset by the cold Past history of fractured skull and menorrhagia
MIND	Heavy, dull (? skull)
HEAD	Headache (old symptom from fractured skull) Dull headache
MOUTH	Ulcer in mouth
THROAT	L. sore throat (old symptom)
ABDOMEN	Distended at M.P. (always so)
URO-GENITAL	M.P. irregular (often)
COUGH	Tickling throaty cough with cold
SLEEP	Wakens at night

<i>No. 4. Prover.</i>	<i>F.S. 30 years</i> Small, thin, dark haired man Studious anxious type
MIND	" <i>Feel better than ever</i> " (first day of powder) <i>Forgetful</i> <i>Can't concentrate</i> <i>Dull</i> <i>Tired</i> <i>Depressed</i> <i>Melancholic</i> < afternoon. <i>Drowsy</i>
HEAD	<i>Tight band round head</i> <i>Dull headache</i> <i>Itchy scalp</i> Pain forehead L. and R. < a.m. Itching pain on vertex Headache < a.m. <i>Heavy head</i>
EYES	<i>Burning in eyes</i> < p.m. Pain behind the eyes Stye on the eyelid
FACE	Nasal discharge
NOSE	Dry nose Hot face in evening
THROAT	<i>Dry throat. Sore and dry</i> Burning Something in the throat Must clear throat continually
STOMACH	<i>Pain in epig. p.c. sudden or L. hypochondrium.</i> <i>R. hypochondrium pain 4–10 p.m.</i> Hunger
ABDOMEN.	<i>Sharp pains</i>

RECTUM	Heavy abdomen Tightness round abdomen Stabbing pains < a.c. < L. side Dull pain in the liver region <i>Itch in anus</i> < after stools <i>Constipation</i> (?) small hard stools (old symptom)
COUGH CHEST	Cough < in open Sharp pain R. lung Stabbing pain in heart region < morning Palpitation Empty chest and weakness Cough < in open air > heat
BACK EXTREMITIES	<i>Pain back R. and L. sides</i> < p.m. <i>Pain in calf</i> < walking <i>Cold feet</i> < night Heavy legs < a.m. Pain R. thigh Weakness in legs < R. L. foot hot, R. foot cold. <i>Cold feet and red hands.</i>
SLEEP	<i>Waking in night</i> <i>Night start 4-5 a.m</i> <i>Light sleep</i> Heavy sleep Waking with fear
PERSPIRATION. SKIN GENERALITIES	More than usual Rough dry skin Heavy feeling

*No. 5. Control and Prover*

*D.C. 28 years*  
Dark haired man  
Medium build

MIND

*Tired*  
*Depressed*

*30c Hydrophis*  
*Tired*

HEAD

Dull headache p.m.  
Burning and stinging when closed  
Nose blocked > open

*L. eye itching and sore.*

EYES

FACE

NOSE

THROAT

Sore throat < a.m. with cold (common symptom)

Sore throat at night < waking < a.m.

Husky < speech  
Thirsty

STOMACH

Nausea

COUGH

Cough > open

BACK

Backache (lumbar) old symptom.

EXTREMITIES

SLEEP

*Wakened* 3 a.m. restless sleep  
Dreams a great deal  
Mind active

Red spots forearm  
Restless sleep  
Wakens 3 -4 a.m.  
Sleepy by day  
Itchy  
Shivering

SKIN

GENERALITIES

This control was given two weeks of sea-snake 30c but this was insufficient to produce definite symptoms.

*No. 6. Prover*

*L.F. 30 years*  
Tall thin, intellectual fair-haired man  
*Feel as if living under a heavy dark cloud*  
*Depressed*  
Disinclination to do anything  
Headache over L. eye a.m.  
Dull headache.  
*Stye L. lower lid*  
*Burning L. lower lid*  
*Itch upper L. lid, swelling*  
L. eye inflamed  
*L. ear deaf* < a.m. as from air lock  
Pain in L. ear  
Itch on L. ear  
Pain shooting down L. face  
Nose bleeding on waking  
*Toothache L. molar and L. lower jaw*  
Tickle on roof of mouth  
*Sore throat* < a.m. or mid-day

Mind

Head

Eyes

Ears

Face

Nose

Mouth

Throat

Stomach	Throat feels swollen on waking	
Abdomen	Pain, dull, constant in epigastrium < a.m	
	Sharp pain L. abdomen < a.m	
	Pain in L. groin	
Rectum	<i>Itch of anus</i>	
	Constipation	
Chest	Sharp pains L. chest	
	Dull pain over heart region	
Back	Pain L. scapula	
	Stiff back < a.m	
Extremities	<i>Stabs of pain</i> L. groin and L. thumb	
	Red spot on palm, L.	
	Shooting pain up left leg from heel	
	Chilblain L. foot	
	Itch on R. palm	
	Pain in L. hip	
Sleep	<i>Waking at 5 a.m. and 2.30 a.m., 4.20, 3.30. Dreams of eels !!!</i>	
	<i>Wakens warm in panic from dreams</i> (sometimes of insects)	
Generalities	< L. side (20 different symptoms) (1 R. side)	
	< a.m	
<hr/>		
No. 7. Prover	<i>H.C. 49 years</i>	
	Small, dark, active man	
	Thin	
Mind	<i>Lack of concentration</i>	
	Irritable	
	Critical	
Head	<i>Headache, continuous, frontal</i>	
	Neuralgic sharp pain in head	
	Throbbing headache	
Mouth	Loss of sense of taste	
	Salt taste in mouth	
Rectum	Constipation	
Uro-genital	Pain in testicles	
Sleep	<i>Dreams on waking</i>	
Skin	<i>Spots on face and neck</i>	
<hr/>		
No. 8. Control and Prover	<i>E.L. 35 years</i>	
	Fair haired, well built, active man	
	South African	
	Healthy, but first time in England	<i>Hydrophis 30c</i>
Mind	Depressed	Can't concentrate
Head	Dull headache, forehead, during cold	
Throat	Sore throat on waking	
Stomach	Thirst	Thirst
Abdomen		Pain in R. abdomen
Rectum		<i>Heaviness in rectum</i>
		Raw round rectum
Extremities	Legs itch in night	Legs itch in night
Sleep	Wakened with start from dream. 6 a.m.	
	Dreams of violence	
Skin	Irritation at night	Irritation at night
Generalities	<i>Tired</i>	<i>Tired</i>
<hr/>		
No. 9. Prover	<i>J.G. 25 years</i>	
	Dark, tall, melancholic girl	
	Subject to backache	
Mind	<i>Depressed</i>	
	<i>Lethargic</i>	
	<i>Weeping from depression</i>	
	<i>Tired</i>	
	Must make an effort	
	Can't be bothered to do anything !	
	< company > alone	
Head	Stiff neck	
	Occipital headache	
Face	Nasal catarrh < a.m.	
Nose		
Mouth	Dry mouth	
	Ulcer in mouth	
	Sore tongue	
Throat	Dry throat. Sore throat	
Stomach	Nausea < M.P. < a.m.	
Abdomen	Dragging in lower abdomen <i>on waking</i>	
Uro-genital	Pain in abdomen at M.P.	
	Red discharge P.V.	
	M.P. excessive	

Chest Ribs feel compressed.  
 Back Pain L. → R. dull, constant < movement  
 Pain L. → R. dull, constant < waking  
 Extremities Pain in L. arm  
 Pain in R. knee  
 Sleep Wakened 4.30 a.m.  
 Hot in bed  
 Generalities Bodily tired  
 > lying down

*No. 10. Prover* *D.P. 25 years*  
 Fair haired man, average build  
 Phlegmatic type  
 Catarrhal subject with frequent colds  
 Mind Heaviness  
 Dull  
 Tiredness  
 Can't study  
 Head Heavy head. Dull headache < frontal  
 Hot forehead  
 Eyes Throbbing pain over L. eye  
 Face Nasal catarrh > open  
 Nose Frequent heavy colds  
 Throat Dry tickle causing cough < heat  
 Dry throat  
 Painful throat from talking  
 Burning pain < swallowing  
 Abdomen Abdominal pain < movement  
 Rectum Stabbing pain in evening  
 Constipation  
 Larynx Hoarse voice < a.m. < talking  
 Cough Cough from tickle in throat  
 Cough < lying down  
 Dry spasmodic cough  
 Chest Stab of pain above heart and L. chest  
 Dryness and burning in chest  
 Palpitation on waking  
 Extremities Numbness of feet  
 L. arm numb  
 Sleep Wakened at 4 a.m. feeling faint and ill  
 Paint feeling on going to sleep  
 Skin Itch uncovered.

*No. 11. Prover* *A.K. 23 years*  
 Tall, dark haired man.  
 Phlegmatic.  
 Soft, flabby build.  
 MIND Feels as if he is going to die.  
 HEAD Vertigo and frontal headache.  
 Shooting pains in forehead L. → R < 2--4 p.m.  
 EYES Feeling of pressure on eyes  
 MOUTH Dry mouth all day and < a.m.  
 THROAT Dry throat < a.m.  
 Sore throat.  
 STOMACH Nausea great 6 p.m.  
 Empty feeling.  
 COUGH Hard barking cough.  
 CHEST Sharp shooting pain in R. chest.  
 Palpitation and dyspnoea.  
 EXTREMITIES Feel as if walking in the air.  
 Weakness of limbs.  
 SLEEP Suddenly awakened at 2.30 a.m.  
 PERSPIRATION Cold sweat 7 p.m.  
 GENERALITIES Heaviness generally.  
 FEVER Peels fevered and ill.

*No. 12. Control* *R.B. 27 years*  
 Slight build  
 Thin man  
 MIND Depressed  
 Lack of concentration  
 HEAD Frontal headache, dull < movement  
 EYES Soreness in p.m.  
 Redness of eyes a.m.  
 MOUTH Small ulcer in mouth  
 THROAT Sore throat > swallowing > hot drink  
 RECTUM Loose stool in a.m.  
 COUGH Dry cough < p.m.  
 SLEEP Wahens 1--4 a.m.

PERSPIRATION	<i>Restless sleep</i> <i>Perspiration</i>
<i>No. 13. Prover</i>	<i>U.B. 24 years</i> Tall, dark haired man. Phlegmatic.
MIND	<i>Tired</i> Thinks someone is in the room with him Cannot think
HEAD	<i>Frontal headache &lt;11 a.m.</i> Burning headache Heavy head Sudden headaches Tight ring round head Headaches < L. side > open air
EYES	<i>Burning behind eyes &lt; L.</i> <i>Tired eyes</i> Excessive lachrymation
MOUTH	Lips feel dry Ulcer L. side of tongue Cannot chew properly
THROAT	Sore swollen throat Throbbing in left tonsil
EXTREMITIES	Tired arms and legs
SLEEP	<i>Suddenly awake at 4 a.m</i> Can't sleep again Light sleep
GENERALITIES	General tiredness Feeling very ill.
<i>No. 14. Prover</i>	<i>R.D. 26 years</i> Slim built, dark haired man. Active mentally and physically
MIND	<i>Tired</i> Depressed Irritable
HEAD	Vertigo <i>Violent headache</i> <i>Throbbing &lt; evening and on waking &lt; frontal &lt; heat &lt; sun</i>
EYES	Vision disturbed L. side of faces disappear
FACE	Watery nasal discharge
NOSE	Burning Sneezing
MOUTH	Ulcer in L. mouth
THROAT	<i>Sore throat in a.m</i> Raw throat
STOMACH	Nausea < heat > open Flatulence
ABDOMEN	Pain L. side < a.m.
EXTREMITIES	<i>Pain in L. hip joint &lt; a.m.</i> Ache and weakness in shoulder and elbow on waking
SLEEP	Sleep disturbed by headache
PERSPIRATION	Cold sweat all over at 6 p.m. < heat

## Discussion

Dr. F. H. Bodman congratulated Dr. Raeside on a first-class piece of work, and remarked that it was perhaps quite alarming to have such active potencies to deal with, and provers who reported such disabling symptoms, in one's first proving. Dr. Bodman suggested that the prover who had no symptoms was perhaps one of those people who in any case, whatever his occupation or preoccupations, would not have suffered, even if he had been bitten by a snake.

The point which interested Dr. Bodman as to the actual pathology was the occurrence of red-stained, even black urine. Was this myoglobin being excreted? A great deal of this had been seen in the case of crush injuries of bomb victims during the war. It did suggest that the fundamental action of this venom was on muscle rather than on the nerves, and the venom might cause actual destruction of muscle tissue. One might be dealing, therefore, with a syndrome where it was not the nerve ends but the muscles supporting them which were affected. This would explain why, when patients got well they got well completely, whereas with a neurotoxic condition, such as poliomyelitis, they did not, some residual effect remaining. It was therefore necessary to think of this remedy in such illnesses as acute rheumatism, rheumatic fever, Bornholm's disease and crush injuries with extensive muscle damage, which of course was a danger not only in the raids but in motor car accidents.

Dr. T. D. Ross, describing Dr. Raeside's contribution as a splendid paper most admirably presented, agreed that it was better to avoid collaboration among provers, if one could. It was most difficult to get a group of people with no contacts.

While *Hydrophis cyanocinctus* was obviously going to be a very useful remedy, Dr. Ross thought the possibility of its use in some nerve lesions should be considered, for example, toxic peripheral neuritis, where there was general illness plus the nerve symptoms, and subarachnitis, where there was bulbar peripheral neuritis. He referred to the *British Medical Journal* papers.

He wondered if Dr. Raeside made any observations on the urine to see if albumin was present in the provings, or any observations on the blood and blood pressure. These were things which should be added nowadays to provings, although the fluctuation of blood pressure was great in normal persons.

It might be possible to be more heroic at times and give perhaps a lower potency. Hughes used to advocate this very strongly and the Research Committee in his day did this in provings both in America and Britain. The stronger potency could be stopped whenever necessary, but it might give more dramatic results.

Dr. Raeside said he had not tested the urine nor taken the blood pressure. Controlling the provers was rather a difficult business as it was, because they were studying medicine, which was quite new to them, and in addition they had this drug proving thrust upon them. One had to assure them that there would be no toxic effects (which was not always quite true) and to tell them that they must stop the proving powders immediately they had severe reactions. If they were doctors—as Dr. Leeser had for his provings of *Rauwolfia*—who were interested, it would be possible to take blood pressure and make other investigations, but he did not think it would be possible with these students.

Dr. Ross asked whether the severe and depressional symptoms continued after the drug had been stopped?

Dr. Raeside replied that they did not. The one who nearly collapsed on a 'bus actually told him about it some days afterwards. He was so annoyed that he had not recorded it in his book, but he told Dr. Raeside that next day, after stopping the powders, he was better.

The Acting President asked whether any difference had been found between the onset of symptoms at different potencies?

Dr. Raeside could not say that there was any special difference. He proved the drug himself. Twenty-eight powders were taken before Easter, then there was a gap for the Easter holidays, and then the powders were resumed. When he started the 30c the symptoms came on quicker the second time, but that, Dr. McCrae told him, might be due to having been previously sensitized to the 6c.

Dr. G. R. Mitchell suggested that the muscle soreness to which Dr. Bodman had referred might be related to rheumatism and the fact that the Chinese used snake venom for rheumatism. Did they use the venom of this particular snake?

Dr. Raeside answered that the *Hong Kong Fisheries Journal* merely recorded that they used it for rheumatism, but did not state how the Chinese used it or what snake the venom came from.

Dr. Pratt noted that the symptoms were obtained after absorption of the toxins through the mucosa. It was just as well that Dr. Raeside did not have to give the doses by injection. How soon did the provings begin to appear when the low potency was taken in the first series of doses?

Dr. Raeside said they appeared after 4-7 days. One recorded the first symptoms on the sixth day. The symptoms began slowly, then built up to a crescendo, at which he told the provers to stop taking the powders and start again when the symptoms had subsided. There were so many factors involved—•—for instance, a prover might get a cold—that it was not easy to get a clear cut a picture as one would like scientifically.

Dr. Bodman drew attention to the fact that Dr. Reid, in discussing the folklore, stated that the natives drunk the blood of the snake and sucked its tail to give them protection.

The Acting President asked whether Dr. Bodman suggested that the venom was not a neurotoxic substance, or whether it was a muscle toxin as well as a neurotoxin—otherwise one would not get bulbar paralysis?

Dr. Bodman answered that if there was great disorganization of the muscle structure there would be involvement of the nerves without the venom being neurotoxic.

Dr. Raeside quoted from Dr. Reid's original paper:

"Rogers and Eraser and Elliott (1905) demonstrated a neurotoxic effect mainly on the respiratory centre but also on the nerve ends."