

one could not be sure that the tincture had not deteriorated *en route* to India during the hot weather.

(2) *Ouabain*.—This crystalline Strophanthin is fairly stable. Even watery solutions have retained their activity for over two years. Different varieties of Strophanthin have different strengths, but this could be avoided by using the same make of Strophanthin for all the tests.

A very small quantity would be required for all the *Depôts* in India.

The best method would be to take out to India during the Winter months a Standard Tincture of Digitalis as well as some Ouabain or Crystalline Strophanthin and test both on Indian frogs at a certain fixed temperature.

It is important to always test them at the same temperatures, as it has been shown that temperature influences the reaction of the frog to Ouabain to a greater degree than Digitalis.

The amount of Ouabain or Crystalline Strophanthin producing per 100 gram frog (Indian) at a certain fixed temperature, the same effect as the Standard Digitalis Tincture, *i.e.*, the minimal amount causing systolic arrest could be found out and used as a standard.

The Ouabain test would be suitable for the frequent testing of tinctures to detect deterioration during the hot weather.

It would be an advantage if once a year during the cold weather, a tincture made from the mixed Indian leaves stored in *Depôts* were compared clinically with a fresh sample of standardised English Digitalis, by testing them on a suitable case of Auricular Fibrillation.

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### THE POISON OF THE SCOLOPENDRIDÆ —BEING A SPECIAL REFERENCE TO THE ANDAMAN SPECIES.

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As I have had some experience, on the pathological effect of the poison of the centipede, both on human beings and animals, a short description of the phenomena will, I hope, be of interest.

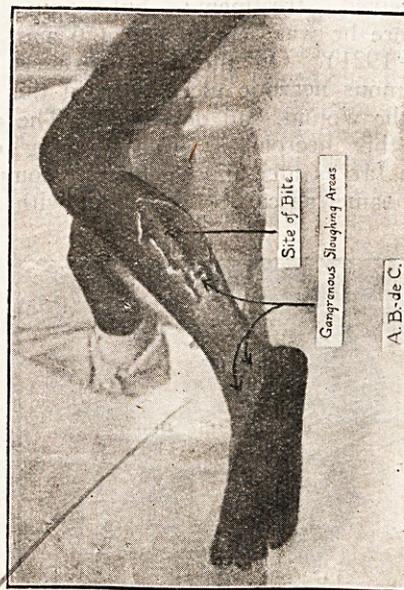
The Scolopendridæ belong to the arthropoda family, and the class chilopoda. The Indian species is the scolopendra heros. They are characterised by a head, and uniformly segmented trunk, and possess very many legs. The poison apparatus is formed by a modification of the first segment to form a pair of jaws, at the

base of which is situated the poison gland, which communicates with the tip of the claw-like process by means of a duct.

The poison is an acid opalescent liquid, which has an intensely corrosive local action.

According to Castellani and Chalmers (*Manual of Tropical Medicine, 2nd Edition*) "Small children have been known to die from the effect of a sting, adults as a rule recover in about 24 hours at most." On the 1st point I am thoroughly convinced of the great possibility of the fact, but on the 2nd point I entirely disagree.

One of my cases, who was in hospital for three months is, at the time of writing, still attending the outpatient department, with an ulcer, the result of a bite, and one other case, a photograph of which is appended, speaks for itself.

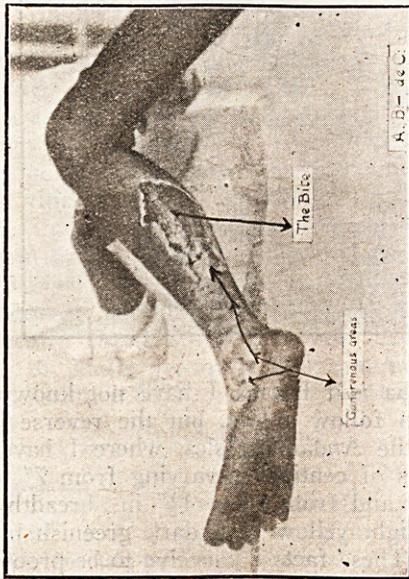


In India and Burma I have not known dire results to follow a bite, but the reverse is the case in the Andaman Isles, where I have seen specimens of centipedes varying from 7" to 13" in length and from  $\frac{1}{4}$ " to  $1\frac{1}{2}$ " in breadth and from a light yellow to a dark greenish blue in colour. These facts I conceive to be proof of a great metamorphosis which has taken place due to natural environments. It is of some interest to note, that Burma, which is said to have been at some long by-gone days, connected with the Andamans and of which there is said to be some geographical proof, has centipedes not nearly so deadly as those in these isles, while the scorpionidæ there, are deadly, if I may so use the word, and they certainly are where children are common—majority of scorpions met with are large and cerned—are quite harmless here. There too the dark green in colour, here they are small and almost white. I have not come across many above 2".

There has been no single case in my hospital who did not develop intense lymphangitis with cedema and inflammation of the skin and subcutaneous tissue, and in most cases a localized necrotic process was started at the site of bite, while in other cases there was set up in addition to this a process not unlike the old time phagedenic ulceration.

I must confess that most of the cases received into my hospital were always several hours after the bite, but even then they invariably had some sort of "first aid" treatment, such as an application of tr. iodine, or the rubbing in of crystals of pot. permang. after making a nick between the two punctures of the bite, so that there is no reason to believe that means for combating evil consequences were not adopted.

The case photographed was bitten on the night of the 27th January, 1921 at 11 p.m., by 11-45 he was in the detention ward and had received treatment; but pain being very severe he was sent to me at 6 a.m. (28th January, 1921). On the 1st February, 1921, the enormous necrotic ulcer, seen in the upper part of the wound, had developed. The extension of this necrobiotic process going downwards as far as the muscle fibres, completely exposing same, as can be made out with a lens



if the photograph is examined carefully. Apart from this, there was considerable lymphangitis, inflammation, and odema of the leg up to the middle of the thigh. Pain of a constant and gnawing character was now complained of and ordinary bromide and chloral draughts had little or no effect.

On the 3rd February, 1921, a gangrenous sloughing process had started from the lower end of the wound to beyond and below the internal maleolus.

On the 5th February, 1921, a good deal of the

slough came away. At the time of writing this wound represents a healthy, clean, granulating surface, there was no pain or any constitutional disturbance.

It is said that the poison "when injected into the veins of a rabbit causes an immediate paralysis with coagulation of the blood, while under the skin it forms a large abscess" (C. & C. Manual of Tropical Medicine, 2nd Edition). The effects of the poison, both local and general, are very pronounced and the development in symptoms can easily be followed stage by stage. Locally at first there is a simultaneous sensation of heat and tingling, which is rapidly superseded by intense pain, radiating up and down the limb. At the points of inoculation two red spots of blood appear, which, within 24 hours, enlarge and disclose a necrotic area. Lymphangitis, with odema, and inflammation extending as far down as the deep fascia, soon supervene and is a common symptom. At times inflammation of the lymphatic glands takes place, but I have not found the process leading to suppuration in any of my cases. The necrotic ulcer keeps enlarging till about the 4th day when it is circular or oblong in shape, exposing about 3" of slough with a further undermining of the skin for about 1" all round.

Occasionally, however, as in three of my cases, very extensive and rapid sloughing takes place. Once the slough is cast off or cut away, a healthy granulating surface appears, but the process of ultimate repair is slow. One of my cases was three months in hospital, is an out-patient now for more than a month, but still has an ulcer about the size of an eight-anna piece. Another of the bad cases came into hospital on the 24th January—at the time of writing this, 1st March, 1921, he is still in hospital with an ulcer 2 in. in diameter, with undermined and unhealthy edges. This man had a rise of temperature for three days, the highest rise being 102.8 on the 25th January, 1921. In almost all the cases that have come under my personal observation, tissue destruction has been most rapid and extensive. A jailor who has been here for many years affirms this observation too, and instances one particular case of another European jailor who was bitten in the upper left arm and in 36 hours had a 4" sloughing ulcer, with excruciating pain of the whole arm and a high temperature.

The sloughing of the skin, subcutaneous tissue, fascia, muscle sheaths, and in some cases muscle fibres, is of a very acute necrobiotic process, while all the symptoms concomitant with an acute toxic condition are at the same time present.

Another point that is rather interesting is that in those cases in whom the phagedenic process was extensive, the pain was not of that extremely excessive nature as in other cases, but the patients were at times found to be in a

dull semi-stuporous condition as was the case photographed. Some of these cases were undoubtedly of an acute gangrenous nature, and here probably a euphrobic condition was present. The ordinary general symptoms are hurried pulse, and slightly hurried respiration, headache, anxiety and pyrexia.

Apart from the knowledge gained in the wards, I carried out a few experiments, by causing live centipedes to bite, or, by injecting the poison with a hypodermic syringe. A record of some of these may be of interest.

A.—Guinea pig, female—bitten on the right shoulder by a large greenish yellow centipede at 10 a.m. Great restlessness, and whining—latter due to pain presumably. Noon: Great swelling and œdema extending up right side of face; 12-10 had a fit; 12-35 died.

B.—Guinea pig, young male, intravenous injection of the poison in saline solution. Developed a comatos condition almost at once. Died in  $7\frac{1}{4}$  minutes.

C.—A frog injected with a solution of the poison developed no bad effects that were apparent, but 24 hours later the web of all four feet were noticed to be black. When let out of his cage he croaked and hopped away quite unconcerned.

D.—Pup,  $4\frac{1}{2}$  months old, bitten on the upper lip. Rapid heart, followed by irregularity and slowing. Developed a stuporous condition. Intense cellulitis followed in 12 hours and in 2 days an ulcer developed which took more than  $1\frac{1}{2}$  months to be completely healed. The pup during this period was very ill. On one occasion she passed a few drops of blood in her urine.

E.—Duck, adult, bitten at 10 a.m. below left eye, was dead in ten minutes.

F.—Drake, old, bitten on left thigh. Developed paralysis of limb in about 10 minutes. Unable to stand and refuses all food. Looks ill, does not mind being handled. Lethargic. In the afternoon it shuffled away to a cool spot, under a rose bush.

Next morning there was a nasty slough of the thigh. Antiseptic applied. Bird had to be fed.

Next morning a bit brighter, ate a little cocoon pap, wound was thoroughly cleaned and all slough removed.

Recovery was uneventful, but up to date the bird limps.

*Note.*—Of course none of these phenomena are observed in the case of a bite from a young scolopendridæ, from whom I also failed to extract the poison.

As regards treatment, I have found nothing to be of any avail if the period between bite and active treatment is delayed beyond an hour. After that incisions, and antiseptic baths, or compresses will be found good, but before that the crystals of pot. permang. rubbed into the

wound after making a small incision, is as effective as liq. ammonia, or a paste of liq. ammonia and pulv. ipecac.

## RADICAL CURE OF HYDROCELE BY PPLICATION AND OVERLAPPING OF TUNICA VAGINALIS WITH STATISTICS OF 225 CASES.

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ONE of the most common methods that nature adopts to bring about a cure of serositis with or without effusion is by causing adhesions, between the visceral and parietal layers of the serous membrane. Though the normal conditions are not restored in as much as the potential space between the two layers is obliterated, yet nature seems to adopt this as the most plausible method of remedying the pathological condition. It is a common experience to observe that in cases of hydroceles undergoing "spontaneous" cure, the tunica vaginalis encroaches by a process of adhesion upon the anterior surface of the testicle from its line of reflection (on either side of the testicle) towards a median vertical line.

The two most common operations performed for the radical cure of hydrocele are excision of the sac or its eversion. But in these methods we ignore the lesson which nature seems to teach us. We disturb the anatomical relations, we deprive the testicle of its natural covering and it lies exposed anteriorly.

In view of the above fact, I have devised an operation for the radical cure of hydrocele by plication and overlapping of the tunica vaginalis. It is briefly described as follows:—

1. *Skin incision and exposure of the sac.*—Make a vertical incision about three inches long through the skin extending from near the spine of pubis. Expose the sac by separating it from all its covering by blunt dissection and gauze-wiping.

2. *Treatment of the sac.*—Make a full length incision into the sac. The testicle and the sac need not be delivered out of the scrotum. Roughen the visceral and parietal layers of the sac by means of a rough dry gauze or a spoon. Pick up one half of the sac, draw it across the testicle and fix by a few sutures to the line of reflection of tunica vaginalis from the testicle. Treat the other half of the sac similarly, but let it overlap and be transplanted on the superficial aspect of the first half of the sac. If the sac is large and redundant, I plicate it particularly at the upper and lower parts (Plate II).

3. *Closure of the wound.*—Close the inguino-scrotal wound by interrupted sutures with or without drainage.