ADDER BITE.

BY

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PERHAPS it may not be out of place if I draw attention to a subject which is seldom touched upon in medical literature—I refer to the effects of, and the dangers incidental to, adder bite. In June last I saw, on the recommendation of Dr. E.H. Grant Morris of Dalbeattie, a lady living in South Durham, on her way home from Scotland. She had been bitten on the ankle by an adder.

An adder strikes suddenly, and, in the act of striking, the venom is pressed through the hollow fangs into the tissues of the victim. In India snake bite exacts every year a heavy death toll, but we have no exact information of the number of people bitten by adders yearly in Scotland. It may, I think, with safety be said that the number of fatal cases of adder bite is small. While walking over heather-clad moors in Ayrshire it has been my privilege to see adders, also my good fortune never to have been bitten by one. Adders are timid creatures and generally glide rapidly out of sight; they do not bite unless trodden upon or when attacked.

A married woman, aged 54, no children, inclined to stoutness, whose menses ceased at 40, and who occasionally had headache and slight functional cardiac trouble following influenza seven years ago, was in June last, when walking on a moor close to the Solway, bitten by an adder above the left ankle. She saw the reptile escape. On turning down her stocking two small punctures were observed; these were bleeding. She was assisted to a cottage a little distance away; there the wound was not bathed, but the limb was kept elevated. An hour afterwards she was seen by Dr. Morris, by whom the wound was dressed and a stimulant administered. Meanwhile severe vomiting and diarrhoea had developed. A stretcher having been obtained, the patient was carried across the moor half a mile to a point where a motor bus had been brought, and in it she was conveyed to her rooms. These she reached in a condition of collapse. When the limb was again examined it was found to be swollen up to the knee; it was red, but not very tender. She felt, however, extremely ill. The limb was dressed with ichthylol and glycerin. That evening and for the first few nights she slept very well. The vomiting and diarrhoea referred to only lasted a few hours. By degrees she got better, but dependency of the limb caused much pain.

When I saw the patient ten days after the bite she was fairly well generally; her emunctories were acting normally, the pulse was 94, the blood pressure 120 mm. Hg, and the urine was free from albumin. The heart and lungs were normal. The left foot and leg, to within four inches of the knee, were red and considerably swollen; the instep was particularly red and swollen; the calf was oedematous, the veins not enlarged, and the knee-jerks were normal; the two minute punctures of the skin were still visible. A film of blood was sent to Professor Stuart McDonald, who reported the absence of abnormality. The patient, after resting in Newcastle for two days, reached her home all right, but it was nearly three months after the injury before the swelling of the ankle disappeared.

In his letter Dr. Morris reminds me that when he first saw the patient the symptoms were entirely local, but soon afterwards there were the gastro-intestinal troubles I have mentioned, attended by collapse and by an almost imperceptible pulse. The vomiting occurred every ten minutes and the diarrhoea was frequent. Dr. Morris, who has seen other cases of adder bite, considered the symptoms unusually severe. He had not met with diarrhoea, in other patients, although in the case of a dog bitten by an adder he had observed vomiting.

Several medical men in the Highlands of Scotland to whom I wrote for facts bearing upon adder bite have replied that they had not seen any cases. Dr. Donald McDougall of Brodick, Arran, gave me details of a lady visitor to Arran whom he had successfully treated for such an injury. The Marquess of Ailsa informs me that, in the case of one of his dogs who was bitten on the pad of one foot by an adder, the limb swelled enormously, and that shortly afterwards the animal appeared to be dead, but that after one of the gamekeepers had slit the wound open with a penknife, squeezed the foot and bathed it with whisky, the beat of the heart and respiration were re-established, and in three days the dog was quite well.

Dr. Lachlan Grant of Ballachulish, to whom I had also written, kindly referred me to ex-Sergeant Morrison of Campbeltown, who is a recognized authority on adders. To Mr. Morrison I am indebted not only for the loan of his typed copy of the pamphlet he intends to publish, but for

permission to make use of some of the information it contains.

There are three different species of snakes in Great Britain: the ring snake, the smooth snake, and the adder. The ring snake is olive grey in colour and measures 2 feet or more; the smooth reptile is usually just a little less than 2 feet in length and is reddish-brown; while the adder is about 21 inches in length. The first two types are non-poisonous. The head of the adder is rather flat and tends to broaden towards the neck. The tail differs in the two sexes, that of the male being short and blunt, while the tail of the female is long and pointed. It is owing to the reproductive organs of the male being contained in the tail that the terminal portion of his body is broader than that of the female. Clothed in a coat of mail of scales and plates with a succession of dark inverted V-like markings stretching from head to tail, and with patches of yellow colouring running into the apex of the incomplete triangles, the reptile can be thus recognized and differentiated from the snakes already mentioned. The adder is found widely distributed over the west of Europe—from Spain, through Great Britain, to the north of Europe. It is common in Scotland. The disputational statement of its absence from Ireland, and from some of the western islands of Scotland, such as Iona, does not for the moment concern us. Like the snake tribe generally the adder hibernates in winter. On the approach of winter adders retire into crevices, and therein they remain in a state of torpidity until February or later. Although cold-blooded they are sensitive to cold; they like to bask in the warmth of the sun. Once, at least, during the year they cast their outer covering. The adder produces its young alive. Mating in April, the young are born four and a half months afterwards, towards the end of August or the commencement of September. Little is known of the family life of the adder, for it does not breed in captivity. Morrison on one occasion captured a female adder, took it home, and in about a week afterwards she gave birth to a family of seven, all of whom died within a week afterwards. These animals were 6½ inches long at birth.

Although the phrase "stung by an adder" is frequently used, an adder does not sting, but bites. There is nothing to fear from the forked tongue, which is repeatedly being shot out and retracted again; it is an organ of touch, and is constantly in requisition, since, owing to the fixed orbits of the animal, the range of vision for objects immediately in front of it is extremely limited, especially on the inner half. The fangs of the adder are two slender sharp-pointed teeth on each side of the upper jaw, curving inwards, and barely three-quarters of an inch in length. They are hollow, and lie in a sheath in the palate; in this sheath is also contained a reserve of another pair of fangs ready to be used should the first be destroyed through accident. The poison glands lie behind the eyes; they secrete a clear fluid, like saliva, which is carried by ducts into the fangs. When the animal is about to strike it opens its mouth to nearly an angle of 90 degrees, erects the fangs, darts its tongue out and in with a hissing noise, and then, all at once, the tongue is swiftly withdrawn and the fangs are plunged into the victim. In the act of biting the poison glands are compressed by muscular contraction, and as a consequence two or three drops of venom are driven along the ducts into the fangs, from the tip of which the poison is injected into the wound inflicted, two minute punctures marking the site of the injury. Although the bite of these animals is dangerous, and must never be lightly considered, yet Morrison has frequently removed the fangs from living adders—a dangerous procedure, and an operation never to be undertaken by any person who is not familiar with the handling of snakes, for, if an adder strikes, it does so with unerring certainty.

In confirmation of the severity of symptoms due to adder bite I can hardly do better than refer readers to the story told by Dr. R. S. C. Edleston of Baslow¹ of the sufferings experienced by Dr. H. Peck, Medical Officer of Health for the Chesterfield District of Derbyshire, who was bitten by an adder, first on the right thumb and hand, and immediately afterwards on the left thumb, when near a reservoir, testing water for peaty acids. Seeing a snake on the ground he picked it up and was bitten. He at once sucked the wounds. Shortly afterwards he felt as if his head was bound by a tight girdle; he became faint and vomited; his lips, tongue, and fauces swelled and breathing became difficult. When seen three hours afterwards by Dr. Edleston there was great

¹ BRITISH MEDICAL JOURNAL, September 11th, 1909.

exhaustion, for which stimulants were given, followed by the hypodermic administration of digitalin and strychnine. For several hours the patient was extremely ill. The right arm swelled considerably, and at one time it seemed as if it might become gangrenous. It was three weeks before the swelling of the arm disappeared.

Probably some persons are more susceptible to the influence of adder bite than others, but no one is altogether immune, nor are such animals as the horse, dog, and sheep. Morrison carried out a series of experiments with frogs and toads, and he found that these animals were immune to the bite of an adder which had been five weeks in captivity. The immunity does not appear to be due to the fact that these animals are cold-blooded, for a lizard bitten by the same adder died twelve minutes after being bitten. Morrison, after raising the question as to whether the immunity possessed by frogs and toads may not be due to the presence of an antitoxin in their tissues, states that he has submitted the results of his experiments to the Wellcome Bureau of Scientific Research.

Treatment.

All writers upon the subject are agreed that since symptoms rapidly supervene, and quickly assume an alarming nature, treatment should be prompt; but as the accident occurs usually in out-of-the-way places, and often at considerable distance from a human habitation, help is often not readily obtained. Such constitutional symptoms as difficult breathing, attended by collapse and a small and irregular pulse, call for the immediate use of stimulants, and upon the value of the prompt administration of whisky or brandy there is complete unanimity of opinion. So far as I know, there is no antivenom treatment for adder bite. Since the poison rapidly produces constitutional effects, an attempt should be made to prevent it being absorbed by sucking the wound, if there are no cracks on the lips, by incising the wound and allowing it to bleed rather freely, also by applying an alcoholic lotion or a fairly strong solution of potassium permanganate. In the case of many persons who have been bitten by an adder a ligature has been tightly applied round the limb on the cardiac side of the injury. Dr. McDougall of Brodick successfully treated his case of adder bite by freely incising the bitten part, cauterizing it with pure carbolic acid, and dressing the wound with permanganate solution. In his patient very few constitutional symptoms followed, notwithstanding the swollen state of the foot. In Dr. Morris's patient the constitutional symptoms were already severe before he arrived on the scene, or at any rate shortly afterwards, but, combating the collapse by means of stimulants, subsequently dressing the swollen limb, first with ichthyol and glycerin, followed later by warm lead lotion, and the internal administration of quinine and phosphoric acid, the patient was placed out of immediate danger in the course of a few days.

Natives of East Africa are extremely afraid of snakes. Discussing this subject with Dr. A. R. Cook, the well-known medical missionary of Uganda, he told me that the number of persons bitten by snakes in Uganda is small, also that he had found the application of a ligature on the cardiac side of the wound, incision, and the application of permanganate crystals gave the best results. The various methods of treating snake bites form interesting reading. The old European method of treating snake wounds in India was to incise the wound, pack it with gunpowder, and ignite the powder. In tropical countries the bites used to be treated by the natives by means of a charm—the serpent's stone—which was said to adhere to the wound and later on to fall off.

Incidental to what has just been stated in regard to adder bite, and bearing upon the collateral subject of snake bite, there have recently appeared in the *Times* abstracts of letters relating to the African puff-adder. The writer of one communication states that he himself had been bitten by an African puff-adder and that he knew of four other white men who had been similarly injured, also of nine natives and Indians. He himself suffered agonies until he was relieved half an hour afterwards by a Kufir witch doctor; with an experience of thirty cases the fatalities, he said, were 80 per cent.

Snake bites are extremely fatal, and frequently with great rapidity. One of my nephews who has recently returned from Burma informs me that when in that country he saw an American oil-well driller who, on dismounting from his horse, inadvertently trod upon a small snake. The reptile struck him upon the inner side of one of his ankles. The accident occurred in the interior of the country. My nephew,

who is not a medical man, but who had witnessed the accident, at once applied Condy's fluid to the wound, dressed the limb, and advised the American to go to the nearest hospital three miles away. The patient did not then feel sick, neither was he collapsed, nor did he feel ill. He remounted and galloped off to the hospital, but he had only gone about half a mile when my nephew, who was watching, saw him fall from his horse, and running forward he, on reaching the spot, found that the American was dead. Death occurred in this instance within half an hour after the injury.

In alluding to the African puff-adder mention was made of the rapid cure of snake bite by a native witch doctor. My nephew told me an interesting story which I simply reproduce, in the hope that it may be corroborated or refuted by those concerned, should they perchance ever read this article. One afternoon he went to Pakokku to spend a few hours with the British doctor at the hospital. In the hospital compound at the time were several snake charmers with whom conversation sprang up. Although these charmers can apparently force snakes to do almost anything they wish yet occasionally the men get bitten. At any rate they showed several minute scars on their hands and arms, which might, or might not, have been caused in the manner they stated. On being asked if they had ever been affected by the poison the men replied in the negative, but they would not say why they had not suffered. Ultimately the snake charmers agreed to a suggestion of the doctor that three experiments should be tried: (1) a chicken was to be bitten by a snake and treated by the snake charmers; (2) a chicken was to be similarly bitten and not treated; and (3) a chicken similarly affected was to be treated by the doctor. The results were as follows: the chicken which was not treated died in twenty minutes; that treated by the doctor died in about the same time. Chicken No. 1 was taken by the men to behind some brushwood quite close at hand, but where their movements could not be seen; they returned with the animal after being absent about ten minutes, and on the following day the fowl was quite well and remained thus. Nothing could draw from the natives the method of treatment they had adopted.

A SIMPLE METHOD OF TREATING CLUB-FOOT

(CONGENITAL TALIPES EQUINO-VARUS).*

BY

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THE following is a simple method of treating club-foot that I have employed for the last ten or twelve years.

It is, of course, well known that the apparent correction of the deformity of club-foot does not in itself constitute a cure. It is necessary after the deformity has been corrected to employ some means of keeping the foot continually in the corrected position until growth and adaptation have changed its anatomy and rendered the correction permanent. This end was attained formerly by putting the child into a walking instrument or apparatus designed to keep the foot in the corrected position during the day—a splint being used at night. Such an instrument is expensive in the first instance. It requires constant adjustment in the case of a growing child, frequent repairs to make good breakages and wear and tear, and an amount of intelligence, which is not always forthcoming, on the part of the parents or guardians to see that it is put on properly and is doing its work efficiently. One has seen many relapses and poor results owing to the failure of instruments to act efficiently from one cause or another, and such causes are often beyond the control of the surgeon. But, apart from this, it is a most unfortunate thing to have to put a healthy child into "irons" for some of the best years of its life.

In recent years a good deal has been done to eliminate instruments from the treatment of club-foot. Some surgeons treat these cases in a succession of plaster casts until they judge that the correction is permanent. Others have done simple or elaborate tendon transplantation or other operations. No orthopaedic surgeon nowadays does drastic bone operations on club-feet in children. The method here described appeals to me because it is simple, efficient, and

* Demonstrated before a meeting of the British Orthopaedic Association in London on October 20th, 1922.