TWO CASES OF SNAKE-BITE, WITH A SUGGESTION FOR TREATMENT.

BY WALTER H. HAW, B.A., M.R.C.S. ENG., L.S.A.

ON Nov. 23rd, 1906, I was sent for to see a native girl, aged about 16 years, alleged to have been bitten on the outer surface of the foot at 5 P.M. on the previous evening by a small snake a few inches long. It was described as having a comparatively large head and is well known to the residents here as a "dik-kop adder" (thick-head adder) or "spring-adder," on account of its jumping propensities, I suppose, when irritated. Apparently the snake is the "horned viper," or hornsmán, but none of the several who had seen it mentioned the presence of horns above the eyes. The animal had been killed, cut open, and the raw surface applied to the wounds after these had been scarified and a ligature applied above the ankle. The girl, after having been bitten, ran at once back to the house and was naturally terribly scared. As far as I could make out no symptoms occurred until about 8 P.M., when vomiting and dimness of vision came on, as well as drowsiness, which increased and necessitated her being kept awake all night. I saw her first at about 12 o'clock mid-day on the following day. She was lying on a pallet in a dark hut, surrounded as usual in serious illness by all her friends and relatives. She was on her right side and the eyes were closed. I am sorry that I am not able to give a more detailed account of the condition of the nervous system, but, of course, my chief attention was directed to what proved to be hopeless attempts to save life. What I have to say was rapidly noted in the course of the treatment.

On the outer side of the left foot, below and in front of the outer malleolus, were the marks of scarifications which had bled. As these had been made through the punctures made by the fangs the latter were not visible, but the farmer who had taken the chief part in the "first aid" informed me that there had been three punctures, suggesting that she had been bitten twice. These were in a single row and had bled. The whole foot was swollen, but I saw no discolouration of skin, ecchymosis, or necrosis of tissue in the region of the bite. A ligature was tightly bound round the leg above the ankle. The leg above this ligature was also swollen and there was a second ligature round the leg below the knee. Above this ligature nothing abnormal was noted externally. The patient lay apparently asleep but could be roused on being shouted at by name and would answer shortly. On being asked if she had pain anywhere, the answer was, "No; only in the leg." If asked to turn over the attempt would be made but without success. The arms and legs could be moved and apparently tactile sensation was not gone from the face, for spasmodic and abortive attempts were made to brush away the flies which had settled on the face and lips. Being asked to put out the tongue the mouth was opened but the tongue did not protrude. There was no objection to the prick of the hypodermic needle in the injured foot, some pain was evidently felt on inserting the needle below the right scapula, and decided struggling occurred on inserting it below the right breast. The breathing was shallow, with marked expiratory phase (not counted), and the pulse was full and strong (also not counted). The respirations were, I should judge, from 20 to 24, and the pulse would be about 90. There was no marked salivation. The eyes were closed and were not opened in response to a request to do so. The upper eyelids were swollen and presented a pinkish-blue discolouration. The colour of the face was not much changed beyond some pallor, which deepened just before death. There had been no hæmorrhages. On lifting the eyelids the eyeballs were fixed and staring with dilated pupils, which did not react to the little light in the chamber. No attempt was made to test the ocular muscles or the optic nerve, but the impression which the position and look of the eyeballs gave me was that both paralysis and blindness were present. On one occasion the father of the girl lifted her into a sitting position, when it was noticed that the muscles supporting the head were paralysed, the latter falling about like a flail and having to be supported. I thought, also, that the breathing became more embarrassed while the patient was in the sitting position. When a teaspoonful of a mixture containing strychnine was placed in the mouth it was discovered that the power of

swallowing was lost, so that the face had to be turned downwards to allow the fluid to run out, for it threatened the larynx. These abortive attempts to swallow appeared to throw the breathing into greater difficulties and shortly afterwards I noticed that the breathing was going to stop, so I tried artificial respiration for some time but in spite of this it steadily and rapidly grew shallower until it ceased altogether. At the moment that the breathing proper finally ceased (what followed were only the final gasps of death) I felt the pulse to be then beating strongly but it slowly grew weaker in spite of the attempts to keep it going by artificial respiration and ceased from five to ten minutes (exact time not taken) after the last respiratory effort, which actually drew air into the lungs. Just before the breathing ceased flatus was passed by the anus. The symptoms observed conformed to those described as resulting from the injection into animals of colubrine venom.

A more fortunate issue attended the treatment of another case of snake-bite which occurred in my practice two years previously and of which I give a *résumé*.

On Dec. 14th, 1904, two natives walked into my surgery, one of them stating that his mate had been bitten on the foot a few hours previously by a night adder. The wounds had been cut into, so that no punctures were visible. Being workers on the railway being built here they were some distance from the village when the accident occurred, but they did not lose much time in coming for help. The man bitten complained of nothing but some dimness of vision and he did not appear to be much concerned about the matter. There was no swelling or discolouration round the alleged seat of wound beyond the general swelling of the foot due to a ligature above the ankle and he seemed, with the exception of the slight dimness of sight, to be in full possession of his faculties, both mental and physical, so much so that I was rather sceptical about his having been bitten, although I am aware that natives are no "slouches" in the matter of snake-bite and seldom or never accuse themselves falsely of having been bitten. The snake had been killed but had not been brought in to me. I injected a solution of permanganate of potash round the alleged seat of the bite, left the ligature, which had been tightly applied above the ankle, in position, and gave him a mixture containing liquor strychninæ, ten minims for a dose. They would not stay in the village, but went home to their huts on the railway line. Two days after, on Dec. 16th, 1904, the same two natives walked into my surgery, and on this occasion the one was leading the other, who had his eyes closed, and held his head high in efforts to see under the upper lids. On being asked to open his eyes he made an attempt to do so, but ended by lifting the lids with his fingers. He was therefore suffering from ptosis of both upper lids. On examining the eyeballs themselves I found both pupils widely dilated and the globes fixed and staring, with no action either to light or to accommodation. There was no blindness, for he could count fingers at the distance of a few paces, and no apparent loss of sensation. On testing the musculature of the eyeballs I found that on looking to the right the right eye moved well towards the outer canthus, while the left remained looking straight forward. Similarly on looking towards the left the left eye moved well towards the outer canthus, while the right remained looking straight forward. No movement either upwards or downwards could be obtained. On testing all the other cranial nerves in order, as well as the spinal nerves, nothing abnormal was elicited. Apparently, all sensation was normal. There was therefore a complete paralysis of both third nerves on the third day after the bite of a night adder. I repeated his strychnine mixture and did not see him again, but was informed that he recovered later. He was not taking belladonna and I got no history that he had taken any native herb which might cause such paralysis. His intellect was quite calm and clear.

With regard to the treatment of snake-bite, I am unaware whether the suggestion I am about to offer has been previously made, but as it seems to me to be in accordance with the dictates of common sense I give it for what it may be worth. I have had no opportunity of trying it, but I shall do so on the first occasion. The great difficulty in the treatment of snake-bite is to keep the venom out of the circulation. If this could be effectually done until such time as the venom is destroyed it may be possible to save more lives than is now being done. The usual method of preventing the venom entering the circulation is by means of the ligature and one is advised to slacken it occasionally to

allow of the poison being worked off in small non-lethal doses. It seems to me that if the circulation be brought to a standstill at the seat of injection it might be possible, if this be done early enough, to prevent any venom at all entering. The venom would be imprisoned, as it were, and could be dealt with by permanganate of potash and incisions. I suggest, therefore, that in cases seen early enough the part be frozen with ethyl chloride spray during the making of the incisions and the rubbing in of permanganate of potash. Where the subcutaneous cellular tissue is loose the part containing the imprisoned poison might be shut off from the general circulation by ligature should needles and thread be handy. All the operations would be painless. A tube of ethyl chloride would not be a large addition to a snake-bite outfit.

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A CASE OF POISONING BY COAL-GAS.

By JOHN REID, M.D. ABERD.

THE patient in the present case was a female child, born on Feb. 20th. When I saw her and her mother on that day I called attention to a slight escape of gas from a bracket in the centre of the room. This bracket was not in use but was tied to the ceiling. On the 21st neither the mother nor the child seemed to suffer from the escaping gas. The room was large and a good fire was burning. On March 8th the child could not suck and had the usual signs of capillary bronchitis. She was in the kitchen, which was somewhat draughty. On the 9th she was removed to the room in which she was born but which had been out of use for a day or two. The change took place after my midday visit, at which I found that marked improvement had occurred in her lung symptoms and that she was able to suck. On the 10th I found very few râles on auscultation, but her lips were chocolate coloured and she was rolling her tongue in the mouth as if gasping for breath. She offered no resistance to examining her throat or to depressing the tongue; on the contrary, there was marked apathy. The eyelids were puffed and a thick mucus exuded from the edges of the swollen lids. The conjunctiva was red on the 8th and was so on this date, but the cornea had the dull lustre found in interstitial keratitis. The pupil was small; the general aspect of the face was ashy; the mouth was dry; and on the tongue there was thick mucus, but no saliva. The mucus seemed to be pushed out of the mouth by the rolling movements of the tongue and to reaccumulate. There was cyanosis of the soft palate, which was of the same colour as the lips. The abdomen was tympanitic and when it was pressed the child showed some signs of uneasiness. She was constipated but the bowels had been well opened on the 9th. She was placed suitably for fresh air and was fed by milk given with a spoon. On the 11th the skin of the body had a dusky or ashy hue. The bowels had been moved by a piece of soap in the rectum and the tympanic appearance had subsided. The eyelids were now open and there was no mucus on the lids—probably a boric acid lotion had removed it—but the cornea and conjunctiva were injected and the dull look suggesting keratitis was still present. The lips were chocolate coloured and the soft palate was cyanosed. There was a slight improvement in the movements of the tongue, but there still was thick mucus in the mouth. The child took milk readily from a spoon. On the 12th there was a bright roseolar rash over the whole body, including the head. A few sudamina were present, but there were large rosy red patches over great parts of the surface. A magnifying glass showed that the condition was a dermatitis or bleeding under the skin rather than a proper eruption. The colour was bright red. The tongue was now bright red, intolerant of touch, and covered with aphthæ. It was difficult to feed the child but she took milk which was given to her. The chocolate colour of the lips and the cyanosis of the soft palate were now less marked. The condition of the cornea was unchanged. The lungs gave no signs of disease, but only of dryness of the tubes. The motions were black (melæna).

The child's state on March 13th was about the same as on the 12th but the soft palate and lips were now red and showed no chocolate colour. On the 14th her state in the morning was much the same as on the 13th, but towards the

evening the rash and aphthæ had pretty well disappeared. She took milk which was given her. The injection of the cornea had passed off but the dull lustreless appearance remained. There were frequent fits of difficult breathing with cyanosis during the day. On the 15th the child looked almost moribund in the morning, but improved with the inhalation described subsequently. There were frequent fits with chocolate colouring of the lips and palate. From the 12th to the 14th there was occasional yawning. It should be mentioned that these fits were not like those met with in fevers and lung affections. There was a semi-comatose state with a chocolate colouring of the lips, which passed off after a time, especially on rousing. In the evening the cornea became more natural and the child's general appearance improved. After the rash had disappeared, in the morning a few bright red patches made their appearance on the fingers; these alone were seen. Her general appearance was more natural, her bowels acted, and the motions were now natural. She was spoon-fed with mother's milk. On the 16th in the morning she had a convulsive seizure, a general convulsion of an epileptic nature, with foaming at the mouth but with little cyanosis. She had been fed during the night and the milk had been returned curdled. Jelly and trypsinised milk were now substituted and retained. At 6 P.M. the child looked natural; she had had no fits but her heart's action was weak. She died from syncope at 7.50 P.M. Marked hypostatic lividity was observed 16 hours after death and a roseolar raised eruption, of a dull character, was at the same time present over the body but not on the head; it was, however, much less copious than during life.

The mother's milk, which ceased on the 10th, was brought back on the 12th by pilocarpine, and on the 16th she had lost all the cyanotic signs from her lips. Evidently the first symptoms of carbon monoxide poisoning were paralysis of the salivary, lacteal, and lacrymal glands, with headache in the case of the mother, and stimulation of mucous glands, or glands of organic life. The fit which the child had on the morning of the 16th was, I think, owing to enfeebled circulation and was not of the carbon monoxide type. The milk had been returned from the stomach curdled.

The treatment up to March 14th consisted of fresh air, appropriate diet, and calomel to move the bowels, and boric acid lotion to bathe the eyes and tongue, with medicines likely to improve secretion. On the 14th, inhalation of chlorine was commenced, the process employed being to mix 10 grains of potassium chlorate with 30 minims of dilute hydrochloric acid in a teacup which was placed near the child's nose until evident signs of irritation occurred. This was frequently repeated during the day. Two minims of this were also added to a two-ounce mixture, of which one-sixteenth part was taken every three hours. It will be observed that the remedy was used late in the case of a very young child, and that no steps were taken to minimise the effects of the release of considerable quantities of carbon dioxide by the chlorine, which formed carbon oxychloride. Probably a more leisurely action employed at an earlier stage would be a safer remedy unless oxygen were available for inhalation, as it was not in this case. I should state that I first used dilute phosphoric acid and potassium chlorate in the mixture, but I think that little or no chlorine resulted from this. The mother recovered rapidly under the treatment. It is rather strange that a dusky or earthy colour at first covered the body. This, I think, was hæmorrhage or pigment of a punctate character. The bright red colour (rash) did not appear till the third day.

Although the antidote was used in the case of a very young subject, debilitated by broncho-pneumonia and tonsillitis (influenza), I feel confident that early and judicious treatment by the chlorine antidote would have led to recovery. As it was death resulted from syncope. It is noteworthy that the mother and child managed to live during the puerperium in the room with a leakage of gas which was repaired on March 11th. The gas became ignited and continued to burn when a lighted match was placed at the point of leakage. The accumulation of gas through the disuse of the room during two days was sufficient to produce very evident signs of poisoning. The child slept in a perambulator, with a hood, both in the kitchen and bedroom. The nursing was good. An inquest was held and the jury returned a verdict in accordance with my evidence.

Wallbrook, E.C.