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.

it does not interfere with the anatomy of the child's foot. The procedure is as follows:

Correction of the Deformity.

The apparent deformity is first fully corrected in the ordinary way by tenotomy, manipulation, and splinting. I personally always divide the two tibial tendons and frequently some of the ligaments on the inner side of the foot, because I believe that better correction is obtained after tenotomy than without it, and I have never seen any ill effects follow the division of these tendons in club-feet. We prefer gradual correction, by daily manipulation and the use of a splint, to forcible redressment under an anaesthetic, because a much more natural and supple foot is eventually obtained by the gradual method. When the varus part of the deformity has been completely corrected or overcorrected I divide the tendo Achillis and frequently the posterior ligaments of the ankle-joint, and again I have never seen the slightest ill effects from this tenotomy in club-foot cases. The equinus deformity is now completely corrected, and the foot is put on a trough splint with a footpiece at a right angle ("tin shoe"), or it may be put in plaster. It is allowed to remain thus for at least a week or two—sometimes it is convenient to wait some months—before the fixation operation.

Fixation Operation.

The object of this operation is to secure permanent fixation of the foot in a corrected position by means of an artificial ligament attached to the outer border of the foot below and to the outer side of the tibia above.

Pearsall's No. 3 pearl silk is prepared according to Lange's formula.* A suitable length is taken out of the melted paraffin with forceps, and the excess of paraffin is removed with a sterile swab.

An incision a quarter of an inch long is made down to bone on the dorsum of the base of the fifth metatarsal bone. A drill with an eye near the point is passed through the base of the fifth metatarsal and thrust out through the sole of the foot. A guide loop of salmon-gut is threaded into the eye of the drill, and by means of this one end of the silk is pulled into the sole, through the base of the fifth metatarsal, and out through the incision on the dorsum. The drill is again passed into the same incision, but this time round the outer side of the metatarsal, and it is made to emerge through the same puncture in the sole. The eye is again threaded with a loop of salmon gut, and the other end of the silk is pulled through to the dorsum. The two ends are pulled out to an equal distance, so that the middle of the silk surrounds the outer half of the base of the fifth metatarsal.

On pulling the loop tight it will often be found that the skin of the sole is dimpled at the point where the silk was passed through, and we have found that when the dimple is allowed to remain the patient sometimes complains of pain afterwards at this spot. So it is well at this stage to give the middle of the loop a few sawing movements—like using a Gigli's saw—and the dimple will then disappear. This also ensures that the loop lies close to the bone and prevents subsequent slackening. A single hitch is now tied in the middle of the loop of silk.

Next a long special probe with an eye near the tip is thrust into the incision on the dorsum of the foot and is carried deeply in the subcutaneous tissues up the outer side of the leg. The tip should be kept well back, and it is made to project beneath the skin somewhere in the lower third of the leg, just in front of the plane of the fibula. A stab incision is made over the tip, which is then thrust out of the leg. The eye is threaded with a salmon-gut loop, and this is pulled down to, and out of, the incision on the dorsum of the foot. Both ends of the silk are then passed into the loop and pulled up to, and out of, the upper incision.

The last step is to pass both ends of the silk separately through the tibia, and to tie them on the inner side. The bone drill is therefore passed into the upper incision and bored straight through the middle of the shaft of the tibia until its point projects beneath the skin on the inner side of the leg. A curved incision is made down to bone, so as to turn back a small flap over the point of the drill. The drill is then pushed out of the wound and its eye is threaded

with a loop of salmon-gut. This loop is pulled through to the outer side of the leg, and one end of the silk is passed into it and pulled through to the inner side. The other end of the silk is passed in exactly the same way, but through a separate drill hole at a slightly higher level.

An assistant now holds the foot firmly in an overcorrected position—that is, abducted and everted. The two ends of the silk are pulled tight, first separately, and then together. Finally, they are tied very tightly in a triple knot on the inner side of the tibia. The little wounds are all closed with fine horsehair stitches.

The foot is now held permanently in the corrected position by a stout ligament attached to bone above and below. It is put on a tin splint for a week or ten days. The stitches are then taken out, and the foot and leg are put in plaster. The plaster is kept on for two months, then it is cut off, and the patient is allowed to walk in ordinary boots or shoes. It should, however, be seen that the boot or shoe is made flat on the inner side.

Instruments.

One or two special instruments will be found useful for this little operation. One is a steel probe for passing the silk up the leg. This has a straight shaft about seven inches long mounted on a handle. The tip is smooth and rounded and slightly turned up (coudé), and there is an eye near the end. The other is a bone drill with a cylindrical shaft. Most of the bone drills on the market have a shaft which expands more or less from the point towards the handle, so that when they have penetrated some distance one is attempting to drive a cone into the hole made by the point. I have therefore had drills made with straight cylindrical shafts, so that they can be passed easily for their whole length. The best form of point is, I think, the miniature gouge, but there should also be a slight groove on the convex side, otherwise the salmon-gut loop is cut as it is pulled back through the bone. These instruments have been made for me by Allen and Hanbury and Krohne and Sesemann.

Remarks.

Failures are nearly always due to faulty technique. Failure to obtain complete correction or overcorrection of the deformity before the fixation operation is the worst mistake. The silk should play no part in the correction; it should merely hold the foot in the corrected position. A certain amount of "give" must be anticipated, and the assistant must hold the foot well everted while the silk is being tied. The amount of correction often looks rather excessive at first.

Failure to keep the silk close to the bone, and to pull it tight enough, is another mistake. If a considerable amount of the soft parts is included in the loop in the sole this will subsequently be absorbed, and the silk will slacken.

The base of the fifth metatarsal is a small thing in a small child, and if the drill strikes it too near its outer side, or if the drill is too large, the thin slip of bone which is caught by the silk may give way. On the other hand, it is not satisfactory to pass the silk round the metatarsal, instead of through it, as I found in some of my earliest cases.

In working through small stab incisions it is impossible to avoid air contact with the skin, as one would like to do in silk operations. So that occasionally there is a mild infection, and a sinus forms, and the silk has to come out. This risk is not great, and I have preferred to take it rather than elaborate the operation.

In passing the probe up the leg the tip should be kept as deeply as possible in the subcutaneous tissues. It should not, however, pass under the annular ligament. The skin is very intolerant of pressure on its deep surface, and if the silk is placed too superficially the skin may slough over it where it crosses the angle between the foot and the leg.

When the silk has been in place for two months or more it will be found that the foot retains its position even though the silk be removed. I have shown by dissection that this is due to the formation of a fibrous cord around the silk, and that this fibrous cord acts in just the same way as the original silk ligament. The silk itself I have found to be absolutely unchanged after nearly two years. For this reason when a sinus forms, either from mild infection or sloughing, the silk should not be removed at once unless the discharge is excessive. When the silk has to be removed one of the cords is cut and the other is forcibly dragged out with Spencer Wells forceps. It nearly always comes out intact, knot and all.

* The silk is first boiled for twenty minutes in 1 in 1,000 mercury perchloride solution. It is then dried aseptically between sterile towels for two days. It is next put into a jar of melted soft paraffin (white vaseline) and cooked in this in a water-bath for two hours. It is kept in the paraffin, which solidifies on cooling, and it is melted down before each operation by standing the jar in an ordinary sterilizer.

In mentioning these causes of failure I may perhaps add that a little practice and familiarity with the operation goes far to eliminate them, and I see far less of them now than formerly. With these few exceptions I have found the operation entirely satisfactory. The children have nice supple active feet, permanently corrected, and they are from the beginning freed from the burden of instruments.

PNEUMOCOCCAL INFLUENZA.

BY

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THE name "influenza" is applied to a variety of ailments. In the recent great pandemic *B. influenzae* was shown to be the infecting organism in a very large number of cases; there may be, however, small local epidemics, influenzal in type, which are caused by other organisms. Clinically the cases have the appearance of influenza, and one might class them, as Sir William Osler suggested, under the head of "influenza nostras."

The series of cases here described occurred among the nursing staff and students of a hospital during the early part of this year. The epidemic began early in January and went on till March, and comprised some forty cases. The pneumococcus was the organism found in overwhelming predominance on examination of throat swabs by direct smear and culture in every case. *M. catarrhalis* and streptococci also occurred, but were in the minority, and *B. influenzae* was not seen. Pneumococci were also the cause of such complications as occurred. Clinically the cases varied from a slight headache, sore throat, and fever to very severe prostration.

In almost every case the first symptoms were referred to the upper air passages. Some complained of having had a cold for a day or two, or a sore throat; in others the onset was more sudden. Then followed headache, which was usually frontal, and attacks of shivering, with pains all over the body, especially in the back and limbs. Such symptoms are similar to those described as the nervous symptoms of influenza. The headache in some instances was intense. Most cases had more or less photophobia, and in some there was considerable conjunctival injection. The tongue was coated with white fur as a rule; in four instances there was vomiting, which persisted for three days in one case. There was no marked diarrhoea or constipation. Fever appeared with the other symptoms. The temperature in some cases reached 104° F.; in others there was only a slight rise. As a rule there was in uncomplicated cases no fever after four or five days.

Sore throat was the most common complaint, and there were patches on the tonsils in most cases; injection was acute in all. The throat and nasopharynx seem to have been the points of attack of the infecting organism. In five cases there appeared on the fauces and soft palate, and on the uvula to a varying degree, a whitish, shining exudate, which had a glazed look; it gradually spread over the surrounding parts, was very thin, almost transparent, and easily detachable. From each of these cases almost pure cultures of pneumococci were obtained. The parts of the throat not covered by the exudate were very injected. The presence or absence of tonsils did not appear to have any influence on the incidence of the infection, but the patients without tonsils got off more lightly. Only three slight cases of adenitis occurred, and the glands at the angle of the jaw were only affected to a small degree in the most severe cases of throat infection. There was not much tendency to downward spread of the infection; bronchitis occurred twice, and there were two cases with pulmonary consolidation; one of the latter ended in widespread bronchopneumonia which proved fatal.

In six of the most severe cases a scarlatiniform erythema appeared early in the illness. It showed itself uniformly on the limbs, trunk, and face at the same time. The extensor surfaces of the limbs tended to be most affected. There was no itching. As the temperature fell the rash faded, leaving the skin rather yellow. There was a very slight powdery desquamation afterwards in two cases. The appearance of the rash was the signal of acute infection, and the patient was soon very ill. The throat was always markedly affected in these cases, and four of them showed the distinctive exudate described above.

Direct spread of the pneumococcus caused such complications as there were. The pus from a double mastoid infection, which set in on the fourth day, gave a pure culture of pneumococci. The same was true of three cases of empyema of the antrum, as also of an acute case of conjunctivitis which began three days after the onset of the original infection.

Clinically these cases exhibited the rather protean symptoms of influenza, although *B. influenzae* was not the cause. The pneumococcus was often present as a secondary infection in cases of true influenza in the recent epidemics, but this outbreak illustrates the observation of Pulfrey⁶ that a primary pneumococcal infection may cause an epidemic with all the clinical appearances of true influenza. This has also been noted by Peset,⁴ who found the pneumococcus to be the cause in 62 per cent. of cases in an epidemic.

Toxic erythematous are seen in acute infections, generally streptococcal in origin. They may occur in pyaemia¹. Such rashes have been described in cases of influenza by Hainiss² and others. Sir W. Osler mentions them as occurring occasionally in pneumonia. No doubt in the outbreak here described they were caused by the absorption of toxins from the throat; it may be noted that they were seen only in the worst cases. The appearance of the throat exudate described above was very striking and distinctive. It would appear to be characteristic of acute pneumococcal infection in the throat.

These few cases serve to show how closely true influenza may be mimicked by an infection due to another organism. My thanks are due to Dr. Harold Wiltshire for his kindness in allowing me to publish this account.

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A CASE OF BRONCHO-BILIARY FISTULA.

BY

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THE following case is an unusual one, and at the same time of sufficient practical clinical interest to merit its being placed on record.

A labourer, aged 47, went to his doctor in June, 1921, complaining of some loss of weight and of feeling generally weak and ill. A few days later a severe hiccup commenced which lasted for nine days and then ceased abruptly. It was so severe that it deprived him of sleep and seriously interfered with eating, and even with speaking. On its disappearance he complained of nothing beyond general weakness, but three weeks later a cough began with copious expectoration which he described as being "like brown jelly and sometimes streaked with blood." This continued for a month, when the colour of the sputum suddenly changed to yellow. It was now intensely irritating and associated with a violent paroxysmal cough which sometimes led to vomiting.

Such was his condition on admission to hospital on November 5th, 1921. His previous record included scarlet fever at 8, pneumonia at 16, and gonorrhoea at 19. He had never been abroad, and had never had any illness resembling dysentery.

He was found on admission to be coughing up large quantities of clear bright yellow fluid, which consisted almost entirely of bile. It contained a few Gram-positive cocci and one or two cells, but no pus. No traces were found of amoebae or the hooklets of *Taenia echinococcus*. He was emaciated and weighed 7 st. 4½ lb. Before his illness he weighed 9 st. 2 lb. He was not jaundiced.

Examination of the chest revealed a small area of impaired resonance at the base of the right lung over which medium crepitations could be heard. The breath sounds over this area were harsh and vesicular in character; the vocal fremitus and resonance were not altered.

The liver was a little enlarged and just below the right costal margin could be felt somewhat rounded and hard. There were several dilated veins in the abdominal wall, chiefly on the right side both above and below the umbilicus. The spleen was not enlarged, there was no ascites, and examination of the faeces failed to reveal any evidence of amoebae. The Wassermann reaction was negative and radiograms showed nothing abnormal.

It was clear that a communication had in some way been effected between the bile passages and the bronchi, and as the condition was causing acute distress Professor A. M. Connell operated on November 25th. Portions of the eighth and ninth ribs were resected on the right side and the upper surface of the diaphragm explored. Dense adhesions were found between the base of the lung and the upper surface of the diaphragm, but no opening through the diaphragm was seen. The adherent surfaces were