foreign body with a coin-catcher; but failed owing to the fact that he was unable to get the instrument past it.

I saw the child on the following day and decided to try and remove the button with a Bruning's oesophagoscope and forceps. Dr. Norman, anaesthetist to the hospital, administered chloroform; and whilst under the anaesthetic I examined the child with an x-ray screen, whilst Dr. Knox, medical officer in charge of the x-ray department, took the two radiographs here depicted. It will be seen in radiograph No. 1, taken from the front, that the button is lying in the oesophagus behind the sternal ends of the second and third ribs, with its flat surfaces looking antero-posteriorly; this is also well shown in radiograph No. 2, taken from the side. The child was then placed on

Fig. 2.—Radiograph taken from the side.

a table, lying in the dorsal position, with her head well over the edge and supported by an assistant. I experienced some slight difficulty in passing the oesophagoscope in a child so young; the neck was very short, and it was not at all easy to get the mouth, pharynx, and oesophagus into a straight line. This difficulty was, however, soon overcome, and I was enabled to get the smallest but one of Bruning's tubes down. At a distance of 15 cm. from the upper incisors I was able to get a view of the upper edge of the button, surrounded by inflamed and oedematous mucous membrane, which was gripping it tightly. I next passed through the oesophagoscope a Bruning's forceps, the nipping ends of which had backward serrations, and with a little manipulation was able to get a good grip of the button, which I then removed together with the tube. Photograph No. 3 shows the exact size of the button. The child subsequently did perfectly well.

Fig. 3.—Showing exact size of button removed from the child's oesophagus.

I think that it is probable that both these cases would have ended fatally had it not been for this direct method. In the case of the infant, the size of the button and the amount of oedema rendered any attempt at getting any instrument such as a coin-catcher past the obstructing body an impossibility.

THE Permanent Bureau of the International Medical Congress which was constituted at Budapest, and has, as already announced, chosen The Hague as its head quarters, has elected Professor Wenckebach, of Groningen, general secretary. It has recently been announced that the Dutch Government has stated that it is prepared to defray the expenses of the establishment of the bureau. Most nations have elected their representatives. Dr. Pavy is the president, the vice-presidents being Professors Waldeyer of Berlin, Müller of Budapest, Maragliano of Genoa, and Dr. Blondel of Paris. Professor Lucas-Championnière, President of the International Medical Press Association, is also a member of the bureau.

DISLOCATION OF A CERVICAL VERTEBRA : OPERATION : RECOVERY.

By FLEET SURGEON HILL, M.V.O.,

H.M.S. "DREADNOUGHT."

ON December 10th, 1907, W. H. W., a stoker from one of the cruisers, was brought to the Royal Naval Hospital, Malta, with a history of having received a severe injury to his neck when playing football that afternoon. As he was "heading" the ball he was charged, with the result that he turned a somersault and fell on his neck and shoulders. He did not lose consciousness.

On admission at 6 p.m. he was conscious but suffering from shock, and complained of severe pain in the back of his neck and inability to move his right leg. There was a large extravasation of blood over the lower cervical and upper dorsal vertebrae, with swelling, but no apparent deformity. The neck was held rigid, and any attempt to move it caused extreme pain. He could move his arms, but the grasp of the hands was very feeble, that of the right being scarcely perceptible. The right leg was completely paralysed. There was great loss of power in the left leg, but some slight movement. Breathing was entirely diaphragmatic; there was no expansion movement of chest wall. Sensation was present, but retarded. Priapism was present, and there was complete retention of urine, but no sense of distension, although a large quantity of urine was drawn off by catheter.

The next day, December 11th, his condition remained much the same. Breathing was entirely diaphragmatic; there was some twitching in the hands and complete loss of grasp in the right hand and diminished grasp in the left. There was very slight power of movement in the left leg and complete loss in the right. Priapism was constant; the urine was drawn off; the bowels were not open; the pain and tenderness in the neck were about the same.

On December 12th there was no marked change. Operation was suggested, but the patient was unwilling to undergo the risk. Next day the temperature was 97.4°, the pulse 68, and the respiration 20. A motion was passed unconsciously. Both legs were now completely paralysed.

On December 14th he passed two motions under him unconsciously; a necrotic bed sore was commencing over the sacrum in spite of his having been kept on a water bed and every precaution taken; the other conditions remained the same. He consented to an operation.

The diagnosis arrived at was fracture of a vertebra, with pressure on the cord by a fragment of bone and by blood. It was decided to cut down over the area of extravasated blood and explore.

Operation.

Owing to the paralysis of the chest wall, a general anaesthetic was looked on as an extra danger, and it was thought advisable to see how far local anaesthesia would carry us through the operation. The skin over the neck, shoulders, and back, having been thoroughly cleansed, Staff Surgeon Richards injected the tissues of the neck from the cervical to the second dorsal vertebra with a solution of eucaine and adrenalin in saline solution. The injection was made endermically, hypodermically, and into the muscles. After half an hour had elapsed the patient was taken to the operating room, and placed on the table in the semi-prone position on the right side. An incision was made over the spinous processes, from the second dorsal to the fifth cervical vertebra. It was found that there was a large extravasation of blood, and that the spine of the first dorsal vertebra was fractured at its base. The muscles were cleared from the spines and laminae of the seventh cervical and first and second dorsal vertebrae. By this time the patient complained so much of his cramped position, although he had experienced no pain from the operation, that Staff Surgeon Whiteside administered chloroform, which was well taken.

The spine of the seventh cervical and the stump of the first dorsal were removed and the laminae cut away. The membranes of the cord looked normal and were opened. Only clear serous fluid escaped, no blood. The cord was not pulsating. A probe passed down the cord met no obstruction, but when passed upwards was obstructed at a point 1½ in. higher up. On passing the finger deeply into the wound above the seventh cervical vertebra the sixth cervical was found dislocated forwards and firmly impacted. With some difficulty the tip of the finger was insinuated under the tip of the spinous process, and steady traction was made by an assistant with one hand under the chin and the other behind the occiput, when the displaced vertebra shot back into place with a sharp report. The cord was noticed to pulsate soon afterwards.

The opening in the membranes was closed by fine catgut sutures, the muscles brought together by stouter catgut, and the skin wound sutured with silkworm gut.

History of Recovery.

The patient's condition when returned to bed was satisfactory; he had borne the anaesthetic well, and on recovering from its effects stated he had lost the pain in his neck. The priapism had disappeared, and a few hours later he expressed a wish to have his urine drawn off, although up to then he had had no consciousness of his bladder being full or not.

The next morning, December 15th, the temperature was 98.2°, the pulse 68, and the respiration 22. No improvement in the movements was noticed; the bed sore was about the size of the palm of the hand, and evidently a large amount of necrosis had occurred. During the course of the next two days the frequent movement necessitated in dressing the bed sore caused the sutures in the neck wound to give way, and a large amount of cerebro-spinal fluid escaped into the dressings, but this gradually diminished day by day, and the wound slowly granulated, and was firmly healed by March 26th.

The course of the bed sore was slow in the extreme, and even when discharged from the hospital for passage to England in June, a small sinus still remained unhealed.

To trace the recovery of the various parts it will be best to describe the improvements separately.

Temperature.

There was a good reaction after the operation, from 96° in the morning to 99.2° in the evening. There was again some collapse on the fourth day and the temperature dropped to 96°, and in the evening was only 97°. From this time, except for occasional rises due to constipation, it showed an evening rise to about 100°, with a morning fall until the end of February, when it was practically normal.

Genito-urinary System.

Priapism, which had been so constant up to the time of operation, did not recur afterwards. Retention of urine lasted for a week, when he passed urine voluntarily, but cystitis ensued, and the bladder had to be washed out for five weeks. There was a heavy deposit of pus, but the reaction remained acid. Although he could pass urine voluntarily, he had only slight control for some months, but eventually recovered it.

Intestines.

The bowels were obstinately constipated, and croton oil was occasionally necessary. At times the faeces had to be removed digitally. This continued until April, when the abdominal muscles regained more power and the bowels acted naturally.

Sensation.

Marked hyperaesthesia was present over the right leg, with some exaggeration of knee-jerks and plantar reflexes, but sensation remained intact. Except for the cramps mentioned below, the only pain complained of was severe headache for about ten days after the operation.

Movements.

Four days after the operation the thighs moved together in adduction, and from this time the movements of the legs increased slowly, the left, which was originally less completely paralysed, regaining complete movement much more quickly than the right. This recovery of power was accompanied by the most acutely painful cramps.

The movements of the arms were strong, but the grasp of both hands remained feeble, with marked atrophy of the interossei; this lasted for four months, and his grasp was far below normal on his discharge after six months.

No decided improvement in the intercostal muscles was noted until February 2nd—the fifty-first day—and the return of power in these muscles was accompanied by severe neuralgic pains corresponding to the cramps in the legs. The movements of head and neck were perfect a very few days after the operation.

He was first allowed on his feet on March 27th, when he was able with considerable help to walk to an armchair. The right leg was kept closely adducted to the left, and no free movement was made with it. From this time, with daily massage, steady improvement was noticed.

On leaving hospital for England on June 2nd, six months after his accident, his condition was as follows:

With the exception of a certain amount of hyperaesthesia, sensation was normal. He had complete control over his bladder and rectum. He could walk short distances (about 30 yards) with the help of one stick, but there remained some uncertainty in the movements of the right leg. The interossei of both hands were atrophied and the grasp poor, but with difficulty he could write a few sentences. Respiration was natural, the temperature normal, the pulse 72.

He was invalided from the service in July, 1908. In his last letter to me in August, 1909, he described himself as much stronger, and able to walk fairly well, but stated that he was weak in the right leg and small of the back. His hands were quite well again.

The question of operative interference in cases of injury to the spine is a very important one. During the past two years I have had three cases in addition to that here recorded, and in none of these was any operation attempted. The first was a fracture dislocation in the dorso-lumbar region, and this patient was alive eighteen months afterwards. He was in a workhouse infirmary, paralysed from the waist downwards, leading a catheter life and passing his motions under him.

The second case was one of fracture dislocation in the mid-dorsal region; he died of exhaustion in about four months.

The third case was a fracture dislocation of the fourth and fifth dorsal vertebrae. He died suddenly on the fifth day. At the autopsy it was found that a sharp-pointed

fragment of the body of the fifth dorsal vertebra had penetrated the posterior mediastinum and caused a severe haemorrhage, as a result of which the man had died.

The encouraging results from the operation in the case recorded makes one think that the operation, if only exploratory, might be performed more often.

Certainly in this case it ought to have been done much earlier, the bed sore would have been saved and probably the cord would have recovered its functions more quickly.

I am sure the operation was greatly facilitated by the use of the local anaesthesia in the preliminary stages, it reduced the risks of a prolonged anaesthesia in a case where respiration was much embarrassed.

Although the operation wound was opened by the movements and the spinal cord must have been in danger, no sepsis occurred and the wound granulated, so that this risk can be avoided. When one considers what a life the patient will lead if left alone, with the unconscious passage of faeces and constant catheterism, it is surely a duty to make at least an exploratory incision and to see the extent of the damage.

While recommending operative interference, it should be remembered that it can only be done where ample nursing facilities are available, as in a hospital or a nursing home. The onerous after-treatment would be well-nigh impossible in a private house.

NOTES ON DIVER'S PARALYSIS.

BY

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FROM 1900 to 1908 I have had medical charge of probably the largest pearling centre in the world, including in its population upwards of 400 professional divers who are daily engaged gathering pearl shell at depths varying from 7 to 20 fathoms. I have myself seen a diver bring up shell from a depth of 25 fathoms (150 ft.), but this was an exceptional feat. This means that these men are working under pressure, roughly, from 20 to 50 lb. per square inch above normal, the shifts varying in length inversely as the depth of working. In the lesser depth a diver will remain down one, two, or more hours, in the greater generally under half an hour. The ordinary rubber diving dress with metal helmet is the apparatus used, air being supplied by three barrelled pumps worked by hand wheels. The divers are of various nationality—whites, Japanese, Filipinos, Malays, etc., the majority being Japanese, the whites being the least numerous. They work from small schooners of 10 to 14 tons, and range over many hundreds of miles off one of the most forlorn and desolate coasts in the world. Consequently, when an accident happens they may be several days' sail from port, and so have not the advantages of their colleagues the "caisson" workers, with their decompressing and recompressing chambers and immediate medical attention. Hence, many severe and often fatal cases of diver's paralysis occur.

For eight years I have impressed on these men and their employers the fact that they can with very little extra time and trouble obtain all the safety conferred by the decompressing chamber by a slow and gradual return to the surface, and when this course has been followed few, if any, cases of paralysis have occurred.

Since 1900, not counting the slighter cases characterized by the men themselves as "rheumatics," I have had upwards of 200 cases of diver's palsy; 60 of the patients were dead before a doctor could be reached and I made *post-mortem* examinations. Among the 140 odd who reached me alive I have had to deal with all degrees of paralysis, from slight paralysis of legs and inability to pass urine (always present) up to total paraplegia and loss of sensation. Clinically, the salient features of the paralysis are its bilateral distribution and the constant loss of the power of micturition. The legs are attacked before the arms and recover later. Sensory nerves seem to suffer much less than motor, but I am bound to add that many cases had to be examined through an interpreter, and it is difficult in any case to get correct replies on such a matter