this date, a full-sized silver tracheotomy tube was inserted, which allowed her to breathe with comfort. In passing the tube the difficulty consisted in the end of the tube catching on some projection from the left side. She swallowed easily through the tube in the mouth, which she could take out and put in herself.

March 9th. There was a tender red swelling in the scar on the right side of the neck, and on the next day the swelling burst and discharged pus.

March 16th. Pus still came from the abscess on the right side, and there was some swelling on the left side of the neck.

March 22nd. The swelling on the left side was increasing and was becoming painful. On this day a large-sized tracheotomy tube, an inch longer than ordinary, was inserted, and she breathed comfortably through it.

March 25th. The tracheal tube was changed daily without any difficulty, and there were no attacks of dyspnoea for some days. When the tube was out, she used to hold the trachea open with dilating forceps, and was more comfortable with these than with any tube.

March 28th. On the afternoon of this date, at 1 P.M., the tube was taken out to be cleaned, as she had some dyspnoea. The patient held the forceps in the trachea as usual, but suddenly she became cyanosed, and before any tube could be got in she was dead.

POST-MORTEM EXAMINATION.

Immediately behind the upper end of the trachea was a large recurrence of the growth with pouches into which the tubes must have been pushed on many occasions when difficulties had been experienced in passing them. At the upper end of the trachea was a flap of mucous membrane and growth, which probably got against the lower end of the tube and obstructed it. The recurrence had extended back from behind the trachea round both carotid sheaths, and had ulcerated almost through the right carotid artery.

To Mr. Frank S. Cresswell, Resident Medical Officer, as well as to his assistants, Messrs. Woods and Pratt, and to Sister Guthrie, my thanks are due for the able and efficient way in which they ministered to the wants and assisted in alleviating the sufferings of the patient.

CEREBRAL TUMOURS SUCCESSFULLY REMOVED BY OPERATION.

BY

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If there is one department of medicine which has benefited by the application of the knowledge obtained through experimental physiology, it is the diagnosis and treatment of cerebral tumours. Thanks to the labours of Hitzig and Ferrier, and more recently to those of Schäfer, Horsley, and Mott, we are becoming familiar with the function of various portions of the surface of the brain, and are able to delegate to these areas certain duties. Although cerebral physiology is still in its infancy and the newer histology of the brain, as demonstrated by the methods described by Golgi and Ramon y Cajal, has obliged us to modify many of our opinions, it is apparent that if physicians and surgeons would successfully cope with the effects of brain disease they must be conversant with cerebral physiology.

No branch of study is more difficult, and, although mistakes are still frequently made by the diagnostician in the localisation of brain lesions, it is encouraging when we are able to report cases where the seat of a tumour has been accurately defined and successfully removed by surgical operation. But for the assistance given by experimental physiology a fatal issue would in time have taken place in both patients whose notes are subjoined. Instead of this, life has been prolonged, suffering prevented, and, in one of the cases at least, the individual has again become the breadwinner of his family. The patients whose illness supplied the facts recorded below were admitted into the infirmary under the care of Dr. Oliver,

who, diagnosing cerebral tumour, sought the assistance of his surgical colleague, Mr. Williamson.

To the first case, that of a male, attention is directed on the ground that what seemed to many who examined the patient rather misleading evidence as to the seat of the tumour—namely, the coexistence of anæsthesia with muscular spasm and paralysis—was to Dr. Oliver rather helpful than otherwise, and becomes a fact strongly corroborative of the view some time ago put forward by Bastian, and more recently elaborated by Mott—namely, that while the Rolandic area is usually spoken of as motor, it is not simply motor, but sensori-motor, so that when this area is destroyed by disease not only is voluntary motion lost, but sensation may be as well. It was this combination of symptoms that was of considerable help in the diagnosis.

CASE I (male). Morning Headache of Two Years' Duration: Vertigo. History of a Fall followed by Unconsciousness lasting for Three Days: Paralysis of Left Arm and Paresis of Left Leg: Disappearance and Reappearance, with subsequent persistence of the Paralysis: Operation followed by almost immediate Recovery of the Loss of Power.—R. R., aged 34, a boilermaker, was admitted on April 8th, 1897, complaining of headache of two years' duration, of loss of power in the left hand, and rigidity of the left leg of eleven weeks' duration. Two years ago patient began to suffer from headache, worse especially on getting up in the morning. Since then he has frequently felt giddy. Eleven weeks ago, while coming down a ladder in the shipyard he had a giddy feeling, and fell forwards, striking his head against an angle iron. The scalp was not broken. He got up, and after walking a few yards, became faint and sat down. A little brandy revived him, but on again attempting, with assistance, to walk, the faintness returned; he was laid down, and shortly afterwards became unconscious. He was taken home, where for three days he remained unconscious. On regaining his senses he found that he could not move his left arm and hand, and that the left leg was rather powerless. In a few days the paralysis gradually disappeared, but four weeks after the accident vomiting came on, and with it the paralytic condition of the left arm and leg already referred to.

The patient tells us that for nearer three than two years he has experienced a peculiar prickling, "like pins and needles," in his left hand, which extended up the arm, and that the limb itself has been the seat of a sensation as of hot water running down it, and that it occasionally shook. There is a history of gonorrhoea, but none of syphilis. He is a well-nourished man, pale and of dark complexion, and very intelligent. Double optic neuritis is well marked, but the sight notwithstanding is good. There is decided weakness of the left hand and leg, and just the slightest paralysis in the lower half of the left side of the face. The knee-jerk is exaggerated, and there is well-marked ankle clonus in the left leg. Heart and lungs are healthy, so, too, are the abdominal organs. The urine is normal. On examining the scalp, two or three small superficial scars are seen, but they are the remains of injuries received in childhood. Patient was treated by means of potassium iodide and liq. hydrarg. bichlor., but without any benefit.

On the morning of April 26th he complained of feeling drowsy, and of having had severe pain in his head. Shortly afterwards he vomited. At noon he had a fit. During the convulsion the left arm and leg and the left side of the face were convulsed. He did not lose consciousness during the fit, which lasted about three minutes. Eight days after this it was apparent that the loss of power in the left arm and leg had become greater, and especially so was this the case in regard to the finer movements of the fingers. There was also well-marked analgesia and anæsthesia of the left hand and forearm, with a slighter loss of sensation in the leg. The muscles of the left arm and leg now began to show signs of atrophy, and the reflexes became even more exaggerated.

In the course of conversation, Dr. Oliver had directed the patient's attention to the advisability of submitting to surgical treatment. For a time this was resented. Painful cramp-like sensations kept recurring in the left hand and forearm, and while there had been no progressive motor paralysis, there was increasing anæsthesia. At no time, however, was any part of the cranium painful on percussion, although, when the left hand was the seat of painful spasm, patient experienced an uneasy sensation in the head just above the right ear. The patient was transferred to Mr. Williamson, who operated on May 14th.

OPERATION.

A large flap, convex upwards, and consisting of the whole thickness of the scalp, was made on the right side of the head. A small hole was then trephined through the skull over the Rolandic area, and this was rapidly enlarged with a special pair of bone-cutting forceps. When the dura mater was divided a tumour was at once seen on the surface of the brain. It was cut out with the handle of a scalpel, and it was rather bigger than the half of a tangerine orange. The cavity in the brain was lightly filled with gauze, and the scalp sutured without replacing any bone. The anæsthetic used was chloroform, and no morphine was given. The gauze was removed on the second day.

Microscopical Examination.—The tumour turned out to be a small round-celled sarcoma.

AFTER-HISTORY.

When seen on the following day the patient expressed himself as feeling quite well. There had been no chloroform sickness. Shortly after recovering from the effects of the anæsthetic he could move his left arm and leg almost as well as ever he could, but it was not until six days after the operation that the paralysis disappeared from the left side of the face. Patient made an uninterrupted recovery. There has remained, as is usual in many of these cases, considerable bulging over the site trephined, but as the operation was never followed by the slightest rise of temperature, anything like a septic cause for this hernial protrusion can be eliminated, and as the swelling comes and goes to some extent, being frequently perfectly flat (February, 1898), fluid effusion is in all probability present in considerable quantity in the sac. The posterior border of the bone around the hernia is at one place thickened, and just internal to it there is increased

resistance. Only once since last May has the patient had a fit, and while we do not exclude the possibility of a recurrence of the cerebral growth which the solitary convulsive seizure and a slight feeling of numbness on two occasions experienced in the left hand rather suggest, the man, generally speaking, is in excellent health, has perfect use in his arm and leg, is quite free from all subjective sensations such as giddiness, and is at present following his occupation, and has done so for the last few months.

Note by Dr. Oliver.—November 5th, 1898.—Since the above was written (February, 1898) this patient has on the whole remained pretty well. The swelling on the side of the head where he was trephined is if anything larger; certainly it is harder than it was. At times there has been return of slight paresis of the left arm. The patient's general condition still remains good, but there is apparently local recurrence of the growth.

CASE II (female). *History of Headache, Vomiting, and of a Fit, followed by Paralysis of Right Arm and Paresis of Right Leg: Operation: Removal of an Angiomatous Growth, followed by Aphemia.*—E. S., single, aged 23 years, a domestic servant, admitted August 29th, 1894, under Dr. Oliver's care, suffering from partial paralysis of right leg and complete paralysis of right arm. At the end of March, 1894, the patient began to suffer from headache and vomiting. The sickness was pronounced in the morning before breakfast, and gradually disappeared during the day, although the headache persisted, and was generally located in the forehead. Headache and vomiting continued until May 12th, when she left service on account of the work being too heavy. On this date she felt her right arm and hand numb, and on the following morning but one, when attempting to get out of bed, she found that she had lost all power of movement in her right arm, and that the fingers were firmly flexed into the palm of the hand. She did not feel ill enough to stay in bed. One evening, about a fortnight after this, she had a fit. The convulsion was slight; she was unconscious for nearly an hour. On recovering consciousness she found that her right leg was now also paralysed and numb. Beyond having had scarlet fever the girl had been healthy until this illness. She began to menstruate at the age of 11, and was regular until February, 1894, when the menses ceased until May 21st, when they reappeared for once only.

Condition on Admission.—The patient is a well-nourished woman. There is a partial paralysis of the right upper arm, but the loss of power in the muscles of the forearm and fingers is complete. There is no impairment of sensation. In walking it is noticed that the right arm is carried in front of her semiflexed, and that the fingers are bent and pressed towards the palm of the hand. There is well marked wrist-jerk, especially when the tendons of the extensor communis digitorum are struck. There is no wasting of muscles except the thenar and hypothenar; those of the forearm feel flabby. The skin of the palm is cracked, and there is considerable perspiration of the hand and arm. There is no wasting of the muscles of the right leg, but she complains of the calf feeling numb, and it, too, is bedewed with perspiration. There is slight analgesia in the right leg; the knee-jerk is increased. In walking she drags the right foot as it is lifted heavily from the floor, when it is observed to be extremely tremulous. There is slight paralysis of the lower half of the right side of the face, and the tongue deviates rather to the right. Pupils are equal. Her expression is dull and heavy. She complains of pain in front of and above the left ear when the skull is tapped. There is double optic neuritis in the first stage. There are no retinal hæmorrhages but the vessels are tortuous. Pulse 88; tongue moist and clean; heart, lungs, liver and spleen are healthy; the urine is normal. During the few weeks she remained under Dr. Oliver's observation patient never once vomited. She had one or two headaches but so slight as scarcely to call for comment. Her menses had not returned since May. As the physical signs suggested the probability of there being a tumour situated in the left motor areas of the brain low down, Mr. Williamson opened the cranium on November 14th, and the following is his note:

OPERATION.

The details of the operation were very nearly the same as those in the first case. A large flap of the scalp was raised, and the aperture made in the cranium was enlarged until the boundary of the tumour was seen. Although it reached to a considerable depth there was no difficulty in removing the growth, and with it a narrow margin of healthy-looking cerebrum was taken away. Chloroform was the anæsthetic, and gauze was lightly put into the cavity in the brain. It was removed on the second day, and healing proceeded perfectly.

AFTER-HISTORY.

On the morning after the operation the patient seemed very well. She subsequently slept for several hours, when on waking she appeared to be drowsy, and to have lost interest in all around her. To questions she returned the answer "Yes," even when a negative was required. She was quite conscious of the fact that at times she was using the wrong word, and was rather distressed by the circumstance. There still remained considerable paralysis of the right arm.

On November 21st she could open her mouth, but she seemed unable to protrude her tongue. Next day she took some beef-tea, and remarked, "It is nice."

On November 23rd she was able to move her right leg, and she lifted the right arm to the face, and on the following day there was slight movement in the right face.

On November 26th she still answers questions with the answer "Yes," but at times, when she means "No," she moves her head from side to side. She appreciates all that is said, but still cannot put out her tongue. She can flex her arm and forearm quickly, and make vigorous movements with her shoulder muscles, although unable to move her fingers. She can lift the leg up from the bed, but in doing so it is noticed that she always raises the forearm at the same time. Once she has made the movements it is a great effort to repeat them. Knee-jerks are more exaggerated than they were, and ankle clonus is well marked.

November 28th. Tongue to-day is protruded, and as the patient smiles there is observed greater symmetry in the two sides of the face. She lifts her right arm and leg better, but speech remains unaltered. Everything is understood by the patient that is said to her. She can pick out printed letters on a card and can reproduce them. There is no agraphia. In other words, there is neither word-deafness nor word-blindness.

January 12th, 1895. There is nothing in the notes of this case from last

November until to-day worthy of being reported. Patient's condition remained pretty much the same as that detailed, particularly so as regards her inability to speak. To-day the Sister reported that when the other inmates of the ward were singing a hymn the patient joined in the singing, and that her voice was distinctly audible. Two of the verses of the hymn she subsequently hummed to herself.

January 31st. To-day she again sang, and later on, when the other patients were singing, she joined them. Her vocabulary is still limited.

On February 3rd she amused some of the patients near her by singing of her own accord a verse of "Maggie Murphy's Home." In conversing with her, Dr. Oliver at this stage could never get more than the word "Yes" from her, although she quite understood all that was said, and there were signs of improvement generally. All her writing had to be done with the left hand; this, however, was never in answer to questions, but simply in the reproduction of letters of the alphabet from memory or by copying.

The patient left the infirmary at this stage, and returned in the first week of May for examination. Unfortunately at this time Dr. Oliver had only the opportunity of seeing her in rather a casual manner, otherwise there would have been a more exhaustive and careful record of her condition at this period. He found her cheerful, and in excellent health and spirits. There was considerable range of movement in the right arm and leg, although still a degree of facial paralysis, yet it was less than when she left the infirmary. Her power of walking had considerably improved. There was still great loss of the power of speech, and a tendency for the word "Yes" to slip out when she meant "No," but her vocabulary had become enlarged, for she could now call her own sister Sally by name, and could also ask for the nurse of the ward when she wanted her. She could not repeat names, although she could print them on paper from memory or from copying. There was no loss of sensation in the limbs.

Note by Dr. Oliver.—November 8th, 1898.—To-day patient presented herself at the infirmary. She has now almost complete use of words, can name objects and people correctly, but her sister states that in course of conversation she has at times still a difficulty in finding the proper word. Eyesight is good; discs are paler than usual. There is slight flattening of the right side of face, with retraction of the left angle of the mouth. There is pretty complete power of the muscles of the right shoulder and upper arm, but the fingers are spasmodically flexed upon the palm, and do not relax readily. She can walk well, but in doing so the right foot is lifted heavily from the floor. The gait is that of an old hemiplegic. Knee-jerk is exaggerated. No ankle clonus. Over the left fronto-parietal region there is observed a deep depression in the calvarium, the posterior border of which is tender to the touch. At her menstrual periods she occasionally suffers from epileptiform seizures. The general health is good. There has been no return of the cerebral growth. The paralytic phenomena present are due to the motor fibres having been separated from the pyramidal cells in the Rolandic area and subsequent degeneration.

The points of interest in Case II are: (1) The unusual pathological nature of the brain tumour. It was an angioma, rather a rare form of cerebral growth, apart from sarcoma. Careful and repeated examination of microscopical preparations taken from various parts of the tumour failed to reveal anything but simple angioma. It is probably owing to this pathological fact, and to the absence of a limiting membrane around the growth, and to the necessity of cutting fairly wide into surrounding brain tissue that the recovery has not been so complete as in Case No. I. The second point of interest is the post-operation aphemia or loss of speech. Immediately after the operation the speech defect was very apparent, but there never was word-deafness nor word-blindness. The patient could, within limits, read and write. She understood all that was said to her. Either a part of the cortical centre itself had been removed, or the paths for the transmission of motor impulses from the third left frontal convolution to the articulation centre in the bulb had been divided by the incision, or these became functionally interfered with owing to the presence of degenerating nerve tissue in their immediate neighbourhood. A certain part of the cortical centre must still be present, and in favour of the view that some functional or inhibitory influence was at work is the fact that under emotional excitement the patient could, particularly when others were similarly engaged, join in singing a hymn or song, and once the articulation mechanism was set going there was no difficulty, for the song was sung correctly verse by verse until the end.

AN OPERATION FOR HÆMORRHOIDS,*

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WHEN internal piles are large enough to be extruded during defæcation, it is distinct evidence of definite pathological change in the mucous and submucous tissues, and it becomes necessary to consider the merits of the different methods of operation.

* Read before the Lancashire and Cheshire Branch of the British Medical Association.