mode of procedure, the drugs and solutions, the same in a long series of cases conducted by surgeons seeing eye to eye. Assuming, as we are bound to do, that his and all the other records involved have been kept in good faith and with equal care, they offer an opportunity for contrast which may be availed of without any wish to make too much of the differences between them.

On the question of the gross mortality or first risk from spinal analgesia, both series are not conclusive. Mr. Owen Richards has frankly recorded three deaths (0.6 per cent.) soon after the procedure. But when the nature of these cases is examined no fair critic could assert that the results were certainly and altogether due to the anaesthetic. The same might be said of my own two fatalities, and almost positively of Dr. Rood's. All were in a desperate condition to begin with. Still they are there, and every surgeon must form his own opinion as to whether they would have survived after any method of anaesthesia. All of them but the last occurred in the early days of a method whose limitations were as yet imperfectly known. In the work of our collaborators, which commenced later when some experience had been obtained and the plan of recording the cases was better developed, it will be seen that there were no fatalities, nor were there in our own after 1908 if we exclude the case of stercoral flooding of the larynx and suffocation in Dr. Rood's experience, as I think may safely be done.

In classifying the technical drawbacks to spinal analgesia as he found them (see table), Mr. Richards places inability to enter the dural canal first with 12 in 500 cases, or 2.4 per cent. The reasons given appear perfectly adequate—that is, faulty needles and wrong direction of puncture. He next mentions that in 38 cases (7.6 per cent.), after reaching the dura and obtaining a flow of cerebro-spinal fluid, the injection was followed by absolutely no effect. The explanation for this is, I suggest, sound and not far to seek (see above). Then there were 18 cases (3.6 per cent.) in which after injection the analgesia was so imperfect that chloroform had to be given. According, then, to his figures, the technical drawbacks to analgesia in his 500 cases, including the 12 failures to enter the dura, were 68, or 13.6 per cent.

In arranging our own collection of 2,354 cases in the same way (*vide table*), it will be seen that there were 13=0.5 per cent. failures to enter the dura in 2,354 cases, of which 3 belong to my own first 100 cases; there were 6=0.2 per cent. of absence of any analgesia on injection, of which 4 occurred in my own first 100 cases, 2 in the next 200, none since. Then there were 100 cases in which after injection the analgesia was insufficient for the completion of the operation=4.2 per cent. So that the technical drawbacks in our 2,354 cases which required the administration of a general anaesthetic (often only a drachm or two), and including failures to enter the dural sac, were in the gross 100=4.2 per cent. Of these, 14 occurred in my own first 50 cases.

The differences on all these points may be said to be small, but as far as they go they seem to support the view that a definite ritual with the same heavy solution, carried out by men who have worked first cordially together and then independently, is more likely to give uniform and better results than where there have been less uniformity of technique and different solutions, instruments, etc.

If any concrete proof of this were necessary, it is offered to us in the accompanying table, which shows Major Houghton's series to be the best of all those given, probably because he had more opportunity of studying the methods in the work of others before employing it himself. He was, with other officers of the Royal Army Medical Corps who followed him, appointed by the War Office specially to assist me at University College Hospital in recording these cases at a time when, in the second hundred, I had more or less got over the first difficulties and failures, and had devised the solutions since used. Then at the Military Hospital, Millbank, he assisted Major Spencer, who had also been much with us. Subsequently, on the Gold Coast and at Aldershot, he worked independently with accumulated experience, with the results shown in the table. It is interesting to note that on the Gold Coast he was obliged to make his own solution fresh, and fresh on account of the climate, and with the best results. Our own results since 1908, when we might

be said to have passed the "tyro" stage, point to the same conclusion.

Mr. Richards's paper, if I may be allowed to say so, appears to me most useful and admirable. He does not yet, to be sure, endorse the opinion expressed above, and held by all those whose results are here tabulated—that the specific gravity of the compound injected plays an important part in the success of spinal analgesia; but perhaps that is to come. But he furnishes strong evidence of the necessity of freshly and carefully prepared solutions, for which I have long contended and provided.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, March, 1907; February, 1908; August, 1908. ² Debate at Congress of German Surgeons held in Berlin, 1910.

SUBDURAL ABSCESS, THROMBOSIS OF THE LATERAL SINUS, AND DIFFUSE OSTEO- MYELITIS OF THE SKULL BONES TREATED WITH VACCINES: RECOVERY.

By T. HARRISON BUTLER, M.D. OXON.,

HONORARY OPHTHALMIC SURGEON TO THE COVENTRY AND WARWICK-
SHIRE AND TO THE WARNEFORD, LEAMINGTON, AND SOUTH
WARWICKSHIRE GENERAL HOSPITALS.

THE following case, which was under my care while I had charge of the Aural Department of the Coventry Hospital, presents features of such unusual interest that I have no hesitation in recording it.

T. W., a male aged 25, came up on February 8th, 1909, complaining that he felt very ill, and had a severe headache. His condition was so serious that he was at once admitted.

History.

He has had a foul-smelling otorrhoea on the right side as long as he can remember, which he has completely neglected. Three days ago he vomited once. Violent earache and much headache came on at the same time. He has felt more ill every day, and "hardly knows how he got to the hospital." No history of rigors.

Present Condition.

The patient is obviously very ill; temperature 100°, pulse 100. He has otorrhoea on the right side, which is very offensive. The right meatus is full of pus and is blocked by polypi. There is tenderness at the tip of the mastoid, but none over the antrum or the emissary vein. The left ear shows no sign of present inflammation, but the drum is thickened and retracted from old chronic disease. The patient is moderately deaf in both ears. No tenderness in the neck over the course of either jugular vein.

In the absence of any very definite signs it was decided to watch the patient for a few hours before opening up the mastoid, but chloroform was given and all the polypi and granulation tissue was removed from the ear with snare and curette.

February 9th. The ear has ceased to discharge and is sweet. The patient vomited twice (9 and 9.30 p.m.). Temperature 100°, pulse 90. There are no signs of cerebral irritation; the patient is quite lucid in his mind; headache bad at intervals. No squint, pupils normal in size and reaction and equal in size. V.R. = § partly, V.L. = § all. There is no optic neuritis.

February 10th. The patient's temperature ran up to 104° in the night, with a rigor; vomited once. Headache better.

February 11th. There is a little stiffness in the muscles at the nape of the neck. Seems very ill indeed. Diagnosis made of subdural abscess, with possible thrombosis of the lateral sinus. Ear now sweet, no otorrhoea.

First Operation.

The radical mastoid operation was performed by Zaufel's method. The bone was so hard that two gouges were broken before the small, deeply-seated antrum was exposed. The tegmen of the antrum was found as a loose sequestrum blocking the aditus. The antrum and subdural space contained about two drachms of thick pus. The dura was freely exposed, the bridge cut down and the middle ear curetted. A meatal flap was turned back above and below, and a large rubber tube placed in the antrum and brought out by the retro-audicular incision. As pus had been found the lateral sinus was not exposed. The patient stood the operation, which lasted about an hour, well.

After-History.

The result of the operation was disappointing. The patient felt better, but his pulse-rate increased to 120, and his temperature became pyæmic in character, ranging from 97° to 103°. The headache ceased, but there was pain and tenderness about 2 in. behind the tip of the left mastoid and at times in the left posterior triangle of the neck. This tenderness on the opposite side introduced an element of doubt into the diagnosis. Was

the left lateral sinus thrombosed? If so, had the thrombus spread from the right side, or was it a primary condition? On February 14th and 16th there was a slight rigor, which strongly suggested sinus thrombosis. Antipneumococcus serum was injected on the 17th, and polyvalent staphylococcus serum on the 18th and 19th. The general symptoms of toxæmia were so slight that it was thought that the infection was most probably staphylococcal. As a matter of fact, an examination of the pus obtained from the lateral sinus showed that the causal micro-organisms were the *Staphylococcus pyogenes albus* and Hoffmann's bacillus or a similar micro-organism. These injections had no obvious effect. On the 19th there was slight twitching of the left side of the mouth and tenderness along the left jugular. An examination of the left ear showed no signs of any recent disease; no optic neuritis. It was decided to expose the right lateral sinus.

Second Operation.

Under chloroform no thickening of either jugular could be detected. Before the lateral sinus was exposed over ½-in. of sclerosed bone had to be cut away, and two more gouges were sacrificed. With the greatest difficulty (owing to the intense hardness of the bone) the sinus was exposed along about an inch of its course. It was full of fluid stinking pus. As there had been some twitching of the left side of the body, and the exposed dura was bulging, it was incised, but nothing escaped. This proceeding was, I think, an error, but no harm resulted. The pus was collected and a vaccine prepared by the Clinical Research Association. At the end of the operation the patient's condition was too precarious to allow ligature of the jugular to be carried out. The result was eminently satisfactory; the patient's condition rapidly improved, although his temperature did not fall much and his pulse remained rapid. The pulse became stronger and regular and he felt much better. His tongue rapidly became clean.

Five days later the vaccine arrived, and was at once used. An increasing dose was given daily, and each was followed by an evening rise of temperature. The following doses were injected: 25 millions, 50 millions, 75 millions, 100 millions, and 125 millions. After the fifth dose symptoms like those of serum disease appeared, skin rashes and joint pain, so the treatment was discontinued. On March 7th the temperature sank to normal. The mastoid wound was healing rapidly. It had been irrigated daily with boracic lotion and hydrogen peroxide and packed with iodoform gauze.

March 10th. The patient's temperature began to rise again, and he received an injection of 175 millions of vaccine.

March 16th. A swelling appeared over the inner aspect of the right tibia, which was red and tender. This did not go on to suppuration, but rapidly got well.

March 20th. The temperature is gradually falling to normal. There was a little diarrhoea with bloody stools. The wound has almost healed.

The patient now appeared likely to make a good recovery, but further complications soon appeared. The temperature became normal, the patient seemed perfectly well, but a swelling appeared over the left squamous part of the temporal bone. This eventually fluctuated, and the patient was anaesthetized and the scalp incised. Nearly the whole of the squamous portion was found loose as a sequestrum and was removed. The skull bones were necrosed all round and a probe could be passed down to the dura in every direction. The dura was exposed over an area of about one square inch and was bathed in pus. The patient, however, declared that he was perfectly well, and his temperature was normal. There were no signs of meningitis. No sooner had this wound healed than a fresh swelling appeared. It was incised, and again bare bone, riddled with holes and widely necrotic, was exposed. The process was repeated until hardly a square inch of his skull escaped. In all, he had twenty operations, and often had six or seven tubes in his head, draining pus. All the time he remained perfectly well. After a full year's treatment in hospital he was discharged hale and hearty, and returned to his work as a fitter at Worcester. Before doing so he was two months at a convalescent home, and the last time I saw him he looked the picture of health.

The question may be asked, Is this case an example of the triumph of vaccine therapy? It is at least extraordinary that a man with such extensive osteomyelitis of his skull should remain in perfect health, with no temperature, and no sign of any cerebral irritation. Mr. Leedham-Green, who saw the case, said he had never seen one like it, and I have never heard of one. In Tilley's book, *Diseases of the Nose and Throat*, a skull is figured on page 188 which gives some idea of the condition of my case, although fortunately his skull was not quite so bad.

THE department of public health in Queensland has commenced this year a campaign in Brisbane against mosquitos, the main object in view being the abolition of dengue fever and filarial disease. The co-operation of all householders is being sought by circulars and visits from officials from the public health department instructing them how to abolish breeding places on their premises and exclude adult mosquitos from their houses.

NASAL OBSTRUCTION DUE TO OSTEOMATA OF THE POSTERIOR NARES.

By F. P. STURM, M.Ch.,

LEIGH, LANCs.

OSTEOMATA of the nasal cavities are so infrequently met with that they constitute the rarest of all the varied causes of nasal obstruction. Cases have been reported by Stein, Ballenger, and Boenhaupt, but nothing definite is known as to the etiology of the condition. Iodides are stated to be of value in cases with a specific history (Ballenger). The following is the single instance of the condition with which I am personally acquainted.

A boy aged 11 was sent to me by Dr. M. J. Halton for operation on account of deafness and complete nasal obstruction. The septum and turbinates as viewed by anterior rhinoscopy were apparently normal. Both drumheads were retracted and immobile; tuning-fork tests revealed typical conductive deafness. The tonsils were enlarged; the naso-pharynx was packed with suppurating adenoid masses which occluded the Eustachian tubes and rendered it impossible to obtain a view of the posterior nares by means of the rhinoscopic mirror. A former operation by another surgeon, four years previously, had lacerated the soft palate, and torn the right half of the uvula completely away. There was no history of syphilis or tubercle.

Under a general anaesthetic the ragged edge of the palate was trimmed, the remains of the uvula removed, the tonsils enucleated, and the adenoids curetted away. Digital examination

Posterior rhinoscopic image.

then revealed a dense bony enlargement of the posterior end of each inferior turbinate. These growths completely occluded the upper respiratory passages, and all but met in the middle line behind the vomerine plate. Each was of the size of a cherry, and of such ivory denseness that neither spokeshave nor saw was able to make the slightest impression, though repeated attempts were made with both these instruments and with posterior nasal forceps. The result of the operation has been that the deafness has completely disappeared and the general health greatly improved, as would naturally follow the removal of suppurating adenoids and diseased tonsils, but the nasal obstruction remains, and will almost inevitably result in the recurrence of the adenoids.

If this case comes up for operation again, or in any similar case, one would be inclined to attempt the removal of the bony tumours by means of a long-bladed gouge or chisel introduced by way of the anterior nares. The accompanying illustration is a sketch of the posterior rhinoscopic image made two months after the operation.

NOTES ON ARTHRITIS.

BY

J. RUPERT COLLINS, M.A., M.D.(DUB.UNIV.),

PHYSICIAN TO CHELTENHAM GENERAL HOSPITAL.

THAT there is a very real difficulty in making a satisfactory classification of the various forms of arthritis is recognized by most writers on the subject, and in practice there is sometimes still greater difficulty in placing a particular case so as to conform to the academic connotation of any particular type. The difficulty suggests that the customary classification is an artificial one and does not correctly represent this form of disease. There is nothing strange in different micro-organisms causing very similar symptoms, and, in fact, *a priori*, it is more remarkable that these primitive vegetable organisms when planted in the body should evoke such dissimilar and characteristic symptoms in the host as many of them do. It is, then, not difficult to see that any classification based on symptoms or morbid anatomy must be a confused one. When the bacteriology of arthritis is more complete, it will be an easy matter to picture clearly the arthritic changes produced by infection in general, together with the peculiar phenomena associated with infection by certain bacteria in