The operation that I usually adopt in these cases had been largely effected by the mucocele and the osteoma, and it was only really necessary to enlarge the opening into the nose in an anterior direction, to provide for more adequate drainage and the insertion of a large rubber tube. The after-history of the case was uneventful, and the eye soon re-occupied its normal position. There was no diplopia.

On examining the osteoma it was seen to be almost entirely covered by a delicate layer of mucous membrane. It would seem probable that the tumour had originated from the lower part of the antero-inferior wall of the frontal sinus, and, as it extended backwards and absorbed the bony wall of the sinus and the ethmoid, it pushed the mucosa in front of it so that, eventually, it was entirely sheathed by it. At the posterior end of the osteoma where it had not reached the cerebral wall of the sinus, the mucosa covering the tumour was not closely applied to it and was polypoid in appearance.

SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY.

February 2, 1924.

President—Mr Sydney Scott, M.S.

The Surgical Treatment of Suppurative and Certain Non-Suppurative Affections of the Labyrinth. Sir William Milligan. (The paper is published *in extenso* in the *Journal of Laryngology and Otology*, May 1924, Vol. xxxix., p. 245.)

Discussion.

Mr Sydney Scott (President) said he was sure that the members would wish to thank Sir William Milligan for his most interesting and important address; he was looked upon by his colleagues as one of the foremost pioneers of labyrinthine surgery.

His (the President's) own experience did not begin before 1904, but the first case which he knew about was operated on by his late colleague, Mr West, nearly twenty years ago. The patient suffered from symptoms very similar to some of those described by Sir William. Mr West had been inspired to operate by Jansen's work in Berlin, and the same source of inspiration probably influenced surgeons in other cities, and induced

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them to take a greater interest in the functions of the labyrinth. Mr West and he (the President) working together, operated upon twenty-nine or thirty cases by 1909, and their work caused some criticism. Some did not believe that labyrinth cases occurred so frequently, others that there was no necessity to operate on the labyrinth. Yet it was clear from the details of the cases reported that, in the majority, the labyrinth had become destroyed by sepsis. This was discovered in the course of the mastoid operation. In the majority of these cases there was no giddiness at the time of the operation, and in many cases there had been no giddiness for years. Since 1909, their clinical observations led them to diagnose with very tolerable accuracy, before doing the mastoid operation, whether they would find disorganisation of the labyrinth.

That led to the question whether it had not been too readily assumed that, because a patient had vertigo, therefore there was disease within the labyrinth. He (the President) would not be contradicted when he said some unnecessary operations had been done. They had to guard against needless destruction of the labyrinth. The following was an example: A child was attacked with tonsillitis on a Saturday, and, on the following Thursday, there was acute earache. Two days later, the patient was admitted into hospital with violent giddiness and marked nystagmus, and the drum was bulging under tension. It was found that the labyrinth reacted to tests. The drum was incised, and in less than twenty-four hours the giddiness and nystagmus had disappeared, without loss of hearing or loss of labyrinthine function. Another class of case was that in which the infection of the middle ear was so virulent, that the organisms penetrated into the internal ear. Quite recently, he had operated on a patient sixty hours after the onset of symptoms of otitis media, and the patient already had acute destructive labyrinthitis and streptococcal meningitis, and died eleven hours later. Sir William Milligan had also raised the question whether one should operate on non-infected cases of vertigo, and in deciding this important question it was agreed that the clinical examination was of the utmost importance.

Sir CHARLES BALLANCE said that he had not himself a great deal to say, but he hoped that what he did say would encourage others to participate in the discussion and give their experiences. The President had pointed out that there were certain cases which should not be operated upon, and with that statement all the members would agree; but in the evolution of every operation in surgery, the same could be said; the operations had not been unjustifiably done deliberately, but because the surgeons felt it was their duty to operate.

With regard to suppurative labyrinthitis, he thought the operation Sir William Milligan had described was the one which should be done. In the presence of suppuration, in all parts of the body, there must be drainage. Without opening the capsule of the labyrinth and freely draining that cavity, pus in the labyrinth could not escape, and the patient would certainly die. Concerning the method of operating, each probably had his own little manœuvre, designed to prevent damage to important structures; he thought the most important thing was to have a very free area of bone exposed behind the facial canal and the prominence of the

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horizontal semicircular canal. Then the rest of the operation became comparatively easy. It was not always necessary to remove the capsule of the cochlea.

The part of the paper dealing with the non-suppurative cases, he thought, would come to be looked upon as one of the foundation papers on the subject.

The first case on which he tried to relieve Ménière's symptom by operation was that of an engine-driver, who drove one of the long-distance expresses to the North. He used to have these attacks while on the foot-plate, and during them his fireman placed him on the coal stack and drove the train himself until his mate recovered. As the man would have lost his work if the officials had come to know of his disability, Sir Charles acquiesced in the man's request that the failing should be kept secret, but insisted on his entering St Thomas's Hospital that very day. He was in the hospital six to eight weeks, and the speaker was waiting to see him in an attack, but during all that time he never had one. He went out afterwards, and had not since been traced.

He agreed that many of these cases suffered from toxic neuritis, and in the majority there was no visible change in the internal ear. The toxæmia affected the nerve, the nerve-endings or the nerve-cells of origin in the brain. He questioned whether, with these dreadful symptoms, the patient could live a happy life. Sir William talked of a bone operation, and Sir Charles suggested that in some of these cases the nerve could be divided behind the internal auditory meatus. Such an operation was much easier, and the wound healed quickly. It was less likely to be followed by infection than an operation on the internal ear—he was speaking of non-suppurative cases. It was very easy to expose the cerebellum and press it backwards by means of dry marine sponges. These sponges were not used nowadays, but in all his experiments on animals Sir David Ferrier used them for displacing the brain from the area in which he was operating, and as the sponges expanded they shifted the brain tissue. When the nerves coming out of the internal auditory meatus were exposed, a probe could be passed between the facial and auditory nerves. A downward cut would divide the auditory nerve.

Dr ALBERT A. GRAY said it must have occurred to members how rare cases of Ménière's syndrome were in children of less than twelve years of age.

With regard to Sir William Milligan's theory as to a toxic condition being present, as distinct from the idea of there being alterations in pressure in the labyrinth, Sir William said he did not notice any excess of pressure in the labyrinth when he was operating. But he (Dr Gray) thought the causation of Ménière's symptoms was not so much a question of whether there was high or low intra-labyrinthine pressure, but rather of a sudden change from one degree of pressure to another. In operating one would not expect to ascertain this. It was so easy to bring on giddiness by merely stooping down, and it was not necessary to invoke toxæmia. Compensation for alterations of pressure in the labyrinth was by means of a very fine tube, and a sudden contraction or dilatation of the auditory artery would suffice to cause increased pressure on the terminations of the nerves in the vestibule and semicircular canals. He agreed there

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must be many toxic cases, but the question of alterations in pressure must be also considered, and that was probably the reason why the condition occurred so often in people who were overstrained and overworked. Those were people who had lost vasomotor stability.

Mr SYDNEY SCOTT (President) (in further remarks) said Ménière's original paper accurately recorded the various types of vertigo they met with now, and which Sir William Milligan had described. In investigating cases of recurrent vertigo, he had been struck by the extraordinary prevalence of catarrh in the middle ear. He felt convinced that many of the cases exhibiting Ménière's symptoms were due to sudden alterations in pressure of the labyrinth caused by changes in the middle ear. He recalled seeing two patients who were under observation at the same time, both sent to have operations on the labyrinth, because they had recurrent incapacitating vertigo, associated with suppuration of the middle ear. A radical operation had already been done on the suppurating ear, but the labyrinth had not been touched. Labyrinth tests yielded no abnormal reactions on either side; there was no fistula symptom, therefore he (the speaker) did not feel justified in opening and destroying the labyrinth on the side of the suppurative disease. On examining the so-called normal ear of one of these patients during an attack of vertigo, he found the drum membrane became diffusely, brilliantly red, and on inflating the tympanum through a Eustachian catheter, the attack ceased at once. The patient was taught to self-inflate the normal ear, and the attacks were cut short by this proceeding, becoming less and less frequent. The second patient noticed a little noise in the good ear before an attack came on. She too responded to treatment, like the first patient, when the good ear was regularly inflated. He had seen the same condition in a patient whose labyrinth had been surgically destroyed nineteen years previously, because she had again become subject to attacks of giddiness which ceased so long as she kept her good ear free from Eustachian obstruction.

He found that in eighty-five out of his first hundred cases of vertigo, there was *obvious* evidence of catarrh and Eustachian obstruction at the time of examination. He had reported to his colleagues at the National Hospital that he could not find any abnormal response to the labyrinth tests to explain the vertigo in these patients, but that there was obvious middle ear catarrh and postnasal catarrh, and that those affections should be treated. When that was done the vertigo disappeared. Recurrence of vertigo in these cases was associated with recurrence of the Eustachian obstruction or inefficiency, or disregard of treatment.

The remaining cases included certain anomalous conditions, nervous diseases or unproven cases. He agreed that the group justifying destruction of the labyrinth would prove to be very small.

Dr P. WATSON-WILLIAMS said he had felt there was a group of cases which had symptoms bringing them into the pseudo-Ménière group, unassociated with gross disease in the ear, but which were essentially catarrhal in origin, and probably due to a "toxic neurosis," or else to reflex vascular changes, perhaps both. He referred to one patient with vertigo as a case in point. He was liable to fall if not supported and had considerable nerve deafness, and could not continue in his business. After

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the corresponding sphenoidal sinus had been drained, there was marked relief. The symptoms, however, recurred, and further exploration showed the patient had definite infective conditions in the posterior ethmoidal cells of the same side. From the time they were opened vertigo had almost ceased to trouble him.

Sir William Milligan had drawn attention to the relatively acute labyrinthitis as compared with chronic cases, which caused a definite infection of the labyrinthine system. Perhaps one of the factors was progressive absorption of the salts of the bone in chronic suppurative processes. In dental conditions, in which the apices of the dental fangs became absorbed by septic processes, it went on so slowly that the patient was usually unaware of anything wrong. It was also seen in chronic suppurative conditions of the nasal sinuses. In opening the maxillary antra, the outer meatal wall was often found to be of only paper-like consistence, no doubt due to the chronic absorption of the bone salts. That was one reason why chronic middle ear suppuration caused purulent infection of the labyrinth through a fistula, whereas the acute cases were more likely to be serous, as the hard layer of bone tended to protect the semicircular canal from penetration by pyogenic organisms.

Mr E. MUSGRAVE WOODMAN confirmed the President's remarks as to the necessity of eliminating simple conditions before considering operative treatment. Three years ago he saw a man, by occupation a tax-collector, who was so incapacitated from duty by attacks of tinnitus and vertigo that he was likely to be pensioned off. He was found to have a tight blockage in his right Eustachian tube. A fine bougie was passed through the tube, and it was tightly gripped at the isthmus. In a month it was repeated, and this time the bougie passed fairly freely. Last week the man came complaining of a little deafness in the other ear, and he volunteered the statement that since the two applications of the bougie there had been no further attacks of giddiness.

Recently he (Mr Woodman) had investigated a few cases of Bell's paralysis, and in a certain proportion of the cases there was definite evidence of the auditory nerve and the vestibular nerve being affected, but not to the same extent as the facial nerve. Some showed diminished labyrinthine reaction and often some tinnitus, which had passed unnoticed in the presence of the more gross lesion of the facial nerve.

The simple conditions having been eliminated, there remained some cases of non-suppurative labyrinthine trouble which must be operated upon, and in regard to these, members felt much indebted to Sir William for his paper. His own experience was limited to one case. Stimulated by Mr Mollison's paper a year ago, he operated upon a nurse who had attacks of vertigo and tinnitus, which had caused her dismissal from the staff of the nursing home. During the attacks she vomited and was much collapsed. He opened the mastoid and the external semicircular canal, thus obtaining free drainage, and then shut it up. For two or three weeks she had bad attacks of giddiness and sickness, but they cleared up at the end of three months, and she was now earning her living.

Mr E. D. D. DAVIS said that he had at present two patients at hospital suffering from attacks of vertigo. One was a nurse who had been incapaci-

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tated twelve months on account of violent vertigo, with nystagmus only during the attacks. A neurologist asked the speaker why he did not open her labyrinth. Occasionally there was slight loss of hearing in one ear. She was a highly-strung, nervous woman. Lumbar puncture was done and she was now quite well, and before leaving the hospital she asked to be lumbar-punctured again. The fluid was normal, but there was a little increase in pressure. The other patient was a doctor's widow, who had had a good deal of anxiety and worked hard. She came with intense vertigo and sickness with nystagmus, and had also lost confidence in herself. He examined her twice and concluded she had commencing otosclerosis ; the Eustachian tube was patent and normal. A Eustachian bougie was passed, and since then she had not had another attack. Another case was that of a man with intolerable tinnitus who was very deaf from secondary sclerosis following suppuration. He (the speaker) asked Mr Lake what his results had been after opening the labyrinth for tinnitus ; the reply was that the results were bad and that he had given up the operation.

With regard to division of the auditory nerve, he (the speaker) thought there had been ten cases reported, and it must be remembered that there was a fairly large auditory artery accompanying the nerve, and that there might be severe hæmorrhage.

Mr G. J. JENKINS said that the operation of superior and inferior labyrinthotomy was a valuable procedure in cases which were suitable for operation.

With regard to the amount of hearing that might remain after inferior-superior labyrinthotomy, he had a case which gave very much anxiety. The patient, a female, seemed to hear conversational voice at 3 or 4 ft. in that ear, and the difficulty was to eliminate the sound ear in the test. With the Bárány apparatus in the good ear she could not hear at all on the side operated on.

The difficulty in regard to the non-suppurative cases was the lack of a definite pathology ; it was not easy to get specimens of the class of case referred to as pseudo-Ménière's. There was a marked difference in the flow of the labyrinthine fluid in a case of Ménière's or pseudo-Ménière's disease as compared with that in certain other conditions in which he had opened the labyrinth. His difficulty had been to deal with the cases in which there was considerable hearing, and in which the vertigo persisted even after inflation for long periods, and there were definite signs of involvement of the posterior part of the labyrinth.

Mr L. COLLEDGE said that if matters were desperate, the question arose as to what operation should be done when a catarrhal condition of the middle ear had been excluded. Sir William said he had not observed evidence of increased pressure in the internal ear. But there might be increased pressure in the posterior fossa. The case mentioned by Mr E. D. D. Davis in which lumbar puncture relieved the symptoms, suggested that increased intracranial pressure might lead to symptoms. A young woman patient of his (the speaker's) had a radical mastoid operation done at another hospital. It was quite healed when he saw her, but she had these symptoms very persistently. He trephined her over the cerebellum, and when the dura was opened, the cerebellum bulged into the

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wound, and on pushing it aside, there was a very free flow of cerebro-spinal fluid. The symptoms disappeared from that time. He suggested that in some cases it would be simpler and safer to do a cerebellar decompression than to open the labyrinth. This also opened the way to dividing the auditory nerve if it was later desired to do so.

Dr H. SMURTHWAITE said that, last year, he had a case with marked dizziness and vomiting. In the left ear there was slight deafness, the drum membrane was indrawn, and there was only slight loss of bone conduction. The patient stayed in bed three days, and, two days after he got up, he had another attack. He could not pass a catheter through the patient's left nostril, as there was a deviated septum. The septum was put in order, and a fortnight later he had another, and a very violent attack of vomiting, and was in bed three or four days. The attacks went on for three or four weeks, with periods of health. After catheterization he improved, and during the last six months his attacks had not been renewed.

In another case, a man complained of vomiting, and a small concretion of hard wax pressed on the drum. The wax was softened and removed, and there were no further attacks. He thought there was a reflex action on the stapedius muscle in that case, causing increased pressure.

Dr W. S. SYME said he thought it was the experience of all members of the Section that in nasal conditions, both purulent and obstructive, vertigo of all degrees was encountered, and in many cases it was no doubt due, as the President said, to middle ear conditions. He always attended to the nasal conditions before regarding a case as a serious one requiring more severe operative measures. In only two non-suppurative cases had he felt justified in recommending the opening of the labyrinth. On one occasion he did lumbar puncture in a non-suppurative condition, but the patient disappeared.

In acute suppurative conditions of the middle ear with apparent labyrinthine involvement, he approached the case more warily than when the suppuration was chronic. In acute conditions he tried first to give thorough rest to the hearing and to the body.

Sir WILLIAM MILLIGAN (replying to the discussion) said that since arriving at the meeting he had received a letter from Mr J. S. Fraser, of Edinburgh, in which he said: "I do not think that you are looking at a hæmorrhage into the internal meatus; I believe that the cellular exudate surrounding the seventh nerve, and, to a less extent, the eighth nerve, is composed of white cells, and that the condition is really one of neuritis, and not hæmorrhage."

On the general question, a number of the remarks made had been somewhat wide of the mark, as he was dealing with the class of case in which members might conclude that every precaution was taken to eliminate the existence of accessory sinus disease, tubal catarrh, etc.

With regard to the remarks of Sir Charles Ballance, it was Jansen who stimulated him (the speaker) to take a special interest in the subject. He saw Jansen operate in Berlin many years ago. Although, in a way, he was a brilliant surgeon, his operations were done far too rapidly, and great rapidity of operation in a region like the labyrinth was too dangerous.

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Sir Charles Ballance suggested that, if operation was going to be done, approach was more easily made through the posterior fossa. With that he (Sir William Milligan) disagreed ; he had tried it on two occasions. No doubt Sir Charles, as an expert brain-surgeon, was more accustomed to operate in that way. He (the speaker) did use sterilized marine sponges, at the suggestion of Sir David Ferrier, and his first operation took him three and a half hours. The facial nerve was injured though the vertigo was quite recovered from. In that case, however, he did the operation in a way no surgeon would do it now—he removed a flap from the side of the head, then put in marine sponges, getting brain and meninges gradually pressed aside. He determined he would not undertake such a tedious procedure again. His second operation was in the posterior fossa, and that also he found a very difficult one ; it was difficult to get the cerebellum back with the aid of the sponges, and during the time the patient was under the anæsthetic he lost a good deal of cerebro-spinal fluid, and was much prostrated afterwards. He managed to divide the nerve, and the result was good. It was much easier, in his opinion, to operate through the outer labyrinthine wall.

He had tried lumbar puncture time after time in these cases ; it was originally suggested by Babinski. He had never found that it gave any permanent relief.

With regard to decompression over the posterior fossa, Quick had published a paper very strongly advocating it, remarking that in a large proportion of cases there was an increase of fluid in the fossa. He (Sir William Milligan) had tried it years ago, but gave it up.

He admitted that if tubal catarrh was present some vertiginous symptoms might occur, but he was not dealing with that type of case, he was speaking of cases in which there was neither evidence of tubal catarrh nor of a middle ear lesion. He would not think of proceeding to operation until every other source of trouble had been eliminated.

Dr Gray advanced the important suggestion that such cases might be intermittent in regard to pressure, and gave this as a reason why at the operation no increased tension of fluid was noted. But if that were so, why was the condition unilateral? He had never seen a bilateral case. He was always careful to ascertain the patient's blood-pressure, and if it were high, treatment was first directed to reducing it ; similarly, if the patient had a catarrhal condition, that was treated first, and, if the symptoms subsided, the internal ear was not touched.

In answer to Dr Watson-Williams, he (Sir William) had always tried to eliminate sinus disease, both by careful examination and by using X-rays.

In reference to the question of acute serous labyrinthitis, which was raised by Dr Syme, he did not think those cases needed operation ; he had never operated upon an acute serous case, and the purulent cases upon which he had operated were either cases of acute purulent labyrinthitis, or were chronic and secondary to chronic purulent middle ear disease. The reason why the bone was affected was, that it was a slow, septic process, causing first erosion, then a fistula, then definite infection.

He wished to emphasize the fact that every possible care was taken in selecting cases for operation ; he looked upon the operation he had described for non-septic disease as in the nature of a somewhat desperate

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remedy, justifiable only in the cases in which the patient had been rendered *hors de combat*, and was quite unable to continue his avocation. And, as was only just to the patient, operation was not considered until he had had the benefit of a long course of medical treatment. So far, he had had no fatalities. The operation was not difficult if the field was sufficiently exposed; but one had to proceed very carefully, and to take special care not to damage the facial nerve. There was only a limited field for the operation, but it gave relief in a class of cases which medicine failed in curing, and the operation appealed to him as a scientific one. The chief disadvantage was that the pathology could not yet be stated in black and white. Even if one had a specimen from a case the difficulties of elucidating the pathology from one temporal bone would be very great. But it was something to think about, and Members could ponder as to whether, in certain clinical conditions, it was worth while to take the risks of the operation. The results were quite satisfactory if the cases for operation were carefully selected.

A Case of Cerebral Abscess—T. B. JOBSON, M.D.—Female, aged 26, admitted on 7th November 1923, with a history of discharge from right ear since childhood. Seven days previous to admission, discharge stopped, and she had pain, headache, vomiting and giddiness.

Temperature 102° F.; pain, tenderness and œdema over right mastoid; reflexes normal; hand grips equal; no inco-ordination. Slight spontaneous nystagmus to left. Radical mastoid operation was performed the same evening; temporal bone sclerotic; antrum full of pus—cavity lined with dirty white cholesteatomatous membrane; lateral sinus exposed and found healthy. Just above tegmen antri, a small extradural abscess was found; dura mater covered with granulations but not sloughy.

After operation she made apparently an excellent recovery. But on 18th November (eleven days after) she complained of headache on right side. Temperature 97.8° F.; pulse 86; and she vomited once. Knee-jerks, ankle, wrist and elbow reflexes increased on both sides; ankle clonus + both sides; Kernig and Babinski negative; no head retraction; no paralysis; eyes normal; mental condition mildly excitable.

19*th November*.—Vomited once; pain in back as well as head; lumbar puncture: fluid clear—under pressure—sterile—leucocytes 3 per cm.; blood count: leucocytes 25,000, polymorphs 93 per cent.

20*th November*.—Temperature rose to 100.8° F.; pulse 100.

21*st November*.—Vomited twice in the night, "feels dazed"; temperature 98.2° F.; pulse 70; nystagmus to left; edges of discs are "woolly"—suggesting early optic neuritis. On the combined evidence a diagnosis of cerebral abscess was made.

Operation: Mastoid incision reopened, flap of scalp turned down, bone over tegmen antri removed 1½ in. by 1 in. At the second incision of the dura (which looked healthy and pulsated) an accumula-

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tion of fœtid pus was struck at a depth of 1 in., size about a hen's egg; two rubber tube drains inserted. The pus yielded a mixed growth: (1) a short streptococcus; (2) pneumococci; (3) *Bacillus coli.*

22nd November.—Much better. Pulse 84; temperature 100°; pupils dilated and do not react to light—? cause. The eye condition lasted four days.

25th November.—Abscess track ionized with zinc. First ionization caused no diminution of the discharge.

2nd December.—Second ionization of abscess track and mastoid cavity. Rubber tubes left out, small gauze wick inserted. After this there was extremely little discharge, although the dressings were only changed twice a week. A third ionization was given on 9th December. A final ionization was given on 16th December when the wound was clean and free from odour. Gauze drain was left out and the wound covered with a sterile dressing after painting the skin edges with iodine. No further dressings were done. The only untoward incident in her recovery was an epileptiform fit on 18th December, when she was unconscious for a couple of minutes. No localizing contractures were observed, but subsequently she complained of some pain in her left leg. The interesting points about the case are:—

(1) The diagnosis of cerebral abscess was made on the temporal headache, vomiting, leucocytosis, and early optic neuritis. There were no localizing paralyses, the pulse was not slowed until the day the abscess was opened.

(2) Treatment of the abscess cavity by zinc ionization appeared to cut short the suppurating process. The wound was clean on 16th December, less than four weeks after the opening of the abscess, although no antiseptics were used in the dressings.

Dr FRIEL, referring to the supposed danger in treatment where electricity was used for ionization, said that if the patient was ionized in a theatre with a concrete or similar composition floor, and the source of the current was the electric light mains, it was important to insulate the table on which the patient lay, if it were of metal, by placing rubber or linoleum under the feet. It would then be impossible to introduce into the patient more current than was indicated by the milliampèremeter.

Chronic Abscess of the Pons arising from Middle Ear Suppuration—E. D. D. DAVIS, F.R.C.S.—Male, aged 35, was admitted on 6th September 1923, for headache and nystagmus, and with a diagnosis of cerebellar abscess arising from mastoid suppuration.

A left radical mastoid operation had been performed two and a half years before (1st April 1921), at another London hospital, for otorrhœa of ten years' duration, pain for one week and incomplete left peripheral facial paralysis; no nystagmus, but considerable deafness. A sclerosed dense mastoid with small crack-like antrum, with

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granulation tissue over the facial and external semicircular canals. No exposure of the lateral sinus, and patient made an uninterrupted recovery with no temperature, and left the hospital after fourteen days.

When admitted on 6th September 1923, patient complained of attacks of headache every two or three months, of one to fourteen days' duration, following the mastoid operation. During the headache, which he localized to the left parietal eminence, he occasionally vomited with no apparent reason or warning, and five weeks previous to admission he often saw double on looking to the left. In addition he complained of giddiness and loss of memory.

On examination by Dr Adie, pulse was 76 to 84; temperature, 98° F.; pupils and optic discs normal; marked rotatory nystagmus on looking to the left; this had the character of labyrinthine nystagmus. Numbness on left side of face and tongue of eighteen months' duration; weakness of left side of face, particularly of the orbicularis oris; reflexes increased on left side; X-ray of skull and Wassermann negative; blood count 10,300 leucocytes per c.mm. Cerebro-spinal fluid: cells 390 per c.mm.; lymphocytes, 84.5 per cent.; polymorphonuclears, 15.5 per cent.; excess of globulin; albumin, 2 per cent.; no tubercle bacilli or other organisms; culture sterile; mastoid satisfactory, no bone disease or suppuration; slight tubal discharge. Monochord, tuning-fork and voice can be heard by left ear. Indefinite labyrinthine reaction to irrigation. No fistula phenomenon.

Diagnosis.—Circumscribed labyrinthitis, and patient was discharged, improved by rest, at the end of fourteen days. He was readmitted a fortnight later, temperature 100° F., increased headache and slightly drowsy. No labyrinthine reaction to irrigation, but hearing as above.

18th October 1923.—Mastoid opened up. Middle ear contained débris, and middle fossa dura had been exposed in the roof of the antrum. Small area of granulation tissue over the facial canal. Examination with a magnifying-glass showed no fistula of the external semicircular canal or of the promontory. Very dense, hard bone, and access to the cerebellum in front of lateral sinus was difficult.

The posterior fossa was trephined behind the lateral sinus and the cerebellum thoroughly explored with forceps and finger with a negative result. Wound closed without drainage, and healed by first intention, and recovery was uneventful.

18th December 1923.—Patient returned with definite increase of facial paralysis. Orbicularis palpebrarum completely paralysed.

27th December 1923.—Patient readmitted with right hemiplegia of one week's duration, commencing with paralysis of right arm; drowsy; incontinence. Paralysis of the left sixth cranial nerve.

Nystagmus as before.

Left temporo-sphenoidal abscess diagnosed, and middle fossa and

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temporo-sphenoidal lobe explored with negative result. Condition unchanged the day after operation and patient smoked cigarettes. Coma and death four days after operation.

Post-mortem.—No meningitis. Posterior fossa and exploration of cerebellum beautifully healed with no signs of inflammation, and almost complete absence of trauma. Temporo-sphenoidal lobe, except for local hæmorrhage, in good condition.

Left half of pons was prominent and on section contained an encapsuled abscess, $\frac{5}{8}$ by $\frac{1}{2}$ in., on a level with the middle cerebellar peduncle. The seventh and eighth cranial nerves were œdematous, fused together, and the internal auditory meatus contained pale granulation tissue. A dissection of the vestibule and semicircular canals showed them to be absolutely normal and there was no fistula of the labyrinth. The facial canal contained granulation tissue.

The interesting points of this case are:—

(1) The unusual position of the abscess and the difficulty of diagnosis.
(2) The probable path of infection along the facial nerve.
(3) The slight amount of damage done by a very thorough exploration of the cerebellum.
(4) The avoidance of drainage following a negative exploratory operation.

Dr ALBERT A. GRAY asked whether hiccough was a symptom in this case. Many years ago he had had a case of a destructive lesion in the same region, and there was very severe and persistent hiccough lasting six weeks.

Sir WILLIAM MILLIGAN said he had never seen an abscess in the pons after middle ear disease; he had wondered whether in this case there was a tuberculous deposit in the pons, which had broken down, so forming an abscess.

Mr SYDNEY SCOTT (President) said Mr Davis's case was particularly interesting because it was unusual to meet with abscess in, or in close proximity to the pons, even secondary to internal ear suppuration. He had seen a patient of the late Dr Frederick Batten who had a mass of tubercle in the pons, and he asked Mr Davis whether there was likely to be tubercle in his case, as Sir William Milligan had suggested was possible.

Mr E. D. D. DAVIS (in reply) said that there was no hiccough in this case. It was just like other otogenic brain abscesses. In this patient there was no tubercle elsewhere. Tubercular abscess in the pons was always secondary to tubercle elsewhere. The organism was a pneumococcus, and there was no evidence of tuberculosis on section of the capsule of the abscess.

Case in which the Chorda Tympani (?) is easily Visible—W. M. MOLLISON, M.Ch.—Female, aged 34, attended Guy's Hospital on account of wax in the left ear. On examination of the right ear

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a strand is seen running from the posterior margin of the membrane towards the short process of the malleus, probably the chorda tympani.

Mr SYDNEY SCOTT (President) said he had not seen a similar case. The only means that occurred to him of settling the matter was by Sectio.

Dr H. SMURTHWAITE said that this patient had evidently had suppurative otitis media. There was a large calcareous deposit in the lower portion of the drum extending from side to side. He doubted whether what one saw as a grey streak just below Shrapnell's membrane was the chorda tympani.

Sir WILLIAM MILLIGAN said he did not think there was a calcareous deposit in this case, but there was evidence of old catarrh on both sides. Mr Cheatle had shown a similar case before the Section some years ago.

Case of Extreme Unilateral Deafness to Sounds by Air, but with Good Bone Conduction in the Affected Ear—A. R. FRIEL, M.D.—Male, aged 38, was in the artillery for some years and had no noticeable deafness. Six years ago he was buried by a shell explosion and was unconscious for three days. About five days later, when in hospital, he noticed he was deaf in the left ear.

Condition in 1922: Hearing, right ear, conversational voice 19 ft., whisper 15 ft. Left ear, nil by air. The tuning-fork on the right mastoid referred to the left ear. Watch heard on left mastoid. Cochlear-palpebral reflex absent on left side, present on right. Syringing left ear with cold water causes nystagmus: and clockwise rotation produces nystagmus lasting twenty-five seconds. The right and left drums are intact.

Dr FRIEL explained that he brought this case to show that when a pensioner complained of deafness he should not be disbelieved because he had good bone conduction.

ABSTRACTS

THE EAR

Frequency of Bilateral Lesions of Shrapnell's Membrane. LUBET-BARBON and LABERNADIE. (*Annales des Maladies de l'Oreille*, December 1923.)

Marchetti and Rivini described an orifice in the membrana flaccida. Other anatomists disagreed as to the constant presence of this orifice. Bezold did not find it in the newly-born. Zaufal and Schmiegelow stated that the foramen was pathological, and most workers agreed with this decision. All agree, however, that there is a part of the

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