again. This is especially the case when the polypi are growing from the ethmoid region, and the pedicles are inserted in the ethmoid cells, or the polypi have grown out from the maxillary or frontal sinuses. Owing to retention of muco-pus, inflammation of the periosteum and necrosis of bone tend to occur secondarily.

The most satisfactory way of preventing the recurrence of simple mucous polypi is to anaesthetize the patient and, with a finger behind inserted into the posterior nares to block it and act as a guide, then to gently curette away the polypi, the lower portions of the ethmoid, the turbinates, and any carious bone, keeping well below the level of the ethmoid plate and the base of the skull. Usually there is no need to plug the nose, but this may be done for a short while with iodoform gauze, when the venous haemorrhage is quickly arrested. But if the maxillary or frontal sinus is involved, it must also be specially treated.

A full examination, however, may show that the polypous formation is really fibrous, sarcomatous, or carcinomatous. There are found tough, sessile growths, easily bleeding, accompanied by pain, and later enlargement of the face. Having excluded retention in the maxillary antrum or frontal sinus (of course, this is often impossible except by surgical exploration), then early pain and later bulging of the facial bones contraindicates mucous polypi.

Fibrous Polypi of the Nose.

I have mostly seen polypi of this class in boys before or soon after puberty. They should be recognized long before the facial bones begin to bulge to produce the so-called frog face. If not removed early the base from which they grow becomes more and more sarcomatous. The fibrous polypi usually grow from the lateral wall of the nose, about the level of the middle turbinal, near the posterior nares. They are redder and firmer than mucous polypi, and occur at an age when mucous polypi are rare.

At the earliest stage removal by a curette and ring knife may suffice. Usually it does not. In one case of a boy, who has since kept well and is serving in the navy, the growth sprung from the lateral wall of the nose just at the hinder end of the middle turbinal. I divided the soft palate, and so reached and excised the growth, immediately reuniting the palate.

If the growth is from the anterior part of the lateral wall, the upper lip may be raised from the alveolar border, and the wall between the nose and antrum with the inferior and middle turbinal may be cut away.

These two methods avoid any facial incision. Larger growths entail partial or total excision of the upper jaw. After turning back the soft parts of the cheek, the least that can be done is to cut away the middle of the upper jaw, leaving the alveolar border and the orbital plate. Supposing this insufficient, it may be necessary to remove the alveolar portion of the jaw and hard palate, then to carefully shell out growth from the ethmoid and frontal sinus, and the pterygo-maxillary fossa. In one boy I operated four times, on the foregoing lines, for what was proved to be fibro-sarcoma. He has now been several years without recurrence. I later replaced the last half of the palate by a flap from the cheek, so that he could be fitted with a good denture.

It is in patients approaching 50 or later that one should assume the probability of a malignant growth. A patient who has not before had any nasal trouble may of course develop a single mucous polypus, easily removable. But unless single and the pedicle clearly definable, if there has been pain and haemorrhage, then one has very likely to deal with a carcinoma, undergoing myxomatous degeneration in its superficial projections. Glands below the jaw may enlarge, but it is important to remember that the lymphatics from the upper and back part of the nose go to prevertebral glands. These may undergo considerable enlargement before being noticed, unless specially sought for.

A small portion of the least myxomatous part of the growth should be plucked away for microscopical examination. Usually a carcinoma is thus discovered, sometimes a sarcoma, including endothelioma under that term.

Upon exploration one will probably disclose a carcinoma springing somewhere from the maxillary antrum and tending to burrow upwards towards the base of the skull and the frontal sinuses. The removal of the upper jaw, the

additional scooping out of extensions of the growth, or excision of glandular enlargements can only be successful in early cases.

NASAL OBSTRUCTION FROM ABNORMALITIES OF THE SEPTUM NASI.

This is a subject to which a good deal of attention has been of late directed. The point to be kept always in the forefront is the removal of obstruction to the free passage of air. Deviations and spurs of the nasal septum have no essential importance, and generally exist unnoticed. When such conditions are found it is very often the case that it is the inferior turbinal with its varying conditions of vascularity which should be treated, and not the spur.

It is the spur immediately within the anterior nares, because it is exposed to external sources of irritation and to drying, which especially requires to be excised by making a muco-periosteal flap. Now this is often continuous with the bony ridge of the upper jaw, and in such cases a general anaesthetic is indicated, because it is too long and painful an operation to do under a local anaesthetic.

As regards septal abnormalities further within the nose, I find the excision of the inferior and middle turbinates, or at least crushing them outwards, more satisfactory in overcoming obstruction. Attempts at excision of spurs far back tend to result in adhesions. Wrenching and forcible straightening is especially suitable following fractures to the nose, but one may generally dispense with the use of nasal plugs afterwards, in particular by combining wrenching of the septum with turbinectomy.

ACQUIRED NASAL OBSTRUCTION.

This is produced in particular by syphilis, and is most difficult to relieve. Either rapid or slow dilatation of the nostrils is followed by a great tendency to relapse, and requires continuous treatment.

Adhesions of the soft palate to the back of the nasopharynx was formerly considered irremediable. For if the soft palate be partly or wholly cut away food passes up into the nose, and if it be merely separated it tends to reunite.

A middle-aged woman who had suffered severely from syphilis came under my care with complete union of the palate to the pharynx. She suffered from accumulations of mucus in the nose, but especially from severe mastoid pains and deafness, owing to obstruction to the Eustachian tubes.

I looked up the subject and found that both excision and simple separation had been tried, and given up for the reasons above noticed.

I proceeded to separate the soft palate and fixed it well forward by sutures in contact with the hard palate. Then I stretched the nares, and ensured a good communication through the nasopharynx. The sutures kept the soft palate forwards for about ten days. After the stitches had been cut out, I regularly stretched the palate by means of a hook until the nasopharyngeal communication with the nose was established. The woman lost her mastoid pain, and yet no food passed into the nose.

I have repeated this operation; so has Mr. de Santi and Mr. Tilley. The cases have been shown at the Laryngological Society, and the relief has proved satisfactory and permanent.

REFERENCES.

¹ London Hospital Reports, 1864, I, p. 211. ² Transactions of the Royal Medical and Chirurgical Society, 1870, vol. xxxv, p. 191. ³ Manual of Diseases of the Throat and Nose, 1884, II, p. 494.

THE TREATMENT OF OTITIC CEREBELLAR ABSCESS, WITH REMARKS UPON THREE SUCCESSFUL CASES.*

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ALTHOUGH our knowledge of the intracranial complications of middle-ear suppuration is fairly well established, there does not seem to be, to judge from the reports of cases which appear in our journals, a general consensus of opinion among surgeons in this country upon one aspect of it. I allude to the best way of approaching collections of pus in the cranial fossae. As I happen to have had recently under my care some cases of cerebellar abscess which illustrate this and other points of practical importance, it will suffice for my purpose if I base my remarks upon this form of abscess.

* Read before a meeting of the South Wales and Monmouthshire Branch.

Suppuration may extend backwards into the posterior fossa along three paths—through the lateral sinus, through the labyrinth, or through the triangular area of bone situated between these two structures and bounded above by the superior petrosal sinus. It is interesting to note that Whitehead¹ records that among 23 cases of cerebellar abscess in the aural department of the Leeds Infirmary during the last few years, there were nine in which the path of infection lay through this last-mentioned area, the lateral sinus and labyrinth being unaffected. The occasional occurrence of a fourth path is demonstrated by one of the cases recorded below (Case III), where osteomyelitis of the temporal bone extended behind the sinus, leaving it untouched, and infecting probably a large occipital cell, which gave rise to abscess in the cerebellum. This condition is, however, very rare.

Cerebellar abscesses result far more frequently from chronic disease of the ear, about 80 per cent. of the total being of this nature. It is well to bear in mind in this connexion that whilst in acute cases these abscesses are usually secondary to sinus phlebitis, in the chronic variety most of them are due to labyrinthine disease. The significance of this I shall allude to later. The distinction between disease of the labyrinth and cerebellar abscess is beset with great difficulty, and forms one of the directions in which work of much importance is now being done.

In chronic disease the bony wall of the middle ear and cavities is implicated, and there is frequently present a condition which, both anatomically and clinically, is so peculiar that it has been regarded by some as a separate disease. I allude to what is known variously as cholesteatoma or pseudo-cholesteatoma, or desquamative otitis media. The last term probably best expresses the essential nature of the process, though it hardly conveys to the mind its immense destructive power. It gives to suppuration in the temporal bone that unique character which distinguishes it from suppuration in other bones and renders it so very dangerous. This interesting condition is due to epidermal penetration into the middle ear cavities, which takes place from the neighbouring tissues having epithelial structure—that is to say, from the skin of the meatus or the membrana tympani. If the epidermis in its spread covers a surface which has ceased secreting we have firm cicatrization as in an ordinary superficial ulcer, and the suppurative process in the ear may be regarded as permanently healed. On the other hand, the lining of the middle-ear cavities may heal in certain places and receive an epidermal covering; at other points suppurating granulations may persist, and the newly-formed epithelium, becoming infiltrated by the pus, swells and desquamates. This process going on continuously, the middle-ear cavities fill up with masses of swollen, pus-infiltrated epidermic cells arranged more or less in concentric layers not unlike the coats of an onion. These accumulating desquamative products destroy by pressure-erosion the bony walls and push their way slowly towards the brain. Cholesteatoma affects especially the antrum, and the changes alluded to go on in those regions—the posterior antral wall, labyrinth, and sinus—which are concerned in the production of cerebellar abscess. Its latency is remarkable. Its progress being slow and gradual, there are few or no symptoms to indicate that a process is going on which entails enormous destruction of bone and serious risks to life. This is illustrated by the patient E. R. (Case II), who was unaware that he had old-standing trouble in the ear. Occasional pain in the side of the head, in the temple or deep in the ear may or may not be present, and I have on more than one occasion found, when operating on cases with hardly any external signs, that so extensive was the disease that I could by carefully chipping away the thin outer shell of bone, remove intact a mass the size of a hazel nut, or even a walnut, leaving an eburnated cavity occupying the whole of the mastoid process with the dura of one or both cranial fossae exposed in places. Why in its spread towards the brain cavity it sometimes produces diffuse meningitis and at other times a circumscribed process such as brain abscess, depends partly on the path of conduction and partly on the virulence of the infection. If there is a low degree of virulence, adhesion of the meninges occurs and acts as a barrier. On the other hand, a latent cholesteatoma may at any time have grafted upon it a virulent infection, as happened in a

patient under my care in whom suppuration had ceased, and hearing on the affected side had become perfect, and who had been for some time entirely free from symptoms. He was suddenly seized with severe pain in the ear, and forty-eight hours later, on opening the antrum, it was found filled with stinking cholesteatoma. The infection had penetrated the sinus groove, which was filled with foul gas, necessitating laying bare and clearing out the sinus from near the torcular to the bulb, and ligating the internal jugular. A *proteus* infection had become grafted upon an old cholesteatoma.*

A clear conception of the essential nature of this process is necessary for the proper understanding of the problem presented by intracranial affections. However well fenced the cranial structures are, those forces of destruction tend to make a gap in the fence sooner or later. The position of this gap determines (1) the nature of the intracranial affection and (2) the route which surgical measures for relief should take. This last consideration is one of great practical importance, and is illustrated by the following cases which have come under my care:

CASE I.—*Cerebellar Abscess: Opened and Drained: Recovery.*

S. A. W., aged 14, admitted February 27th, 1907, had foul discharge from the left ear for six years after scarlet fever. Nine days before admission she was seized with severe pain in the head, which had been continuous. There had been no sickness, no rigor. Discharge from the ear had become less and the temperature had been running up to 104°. On admission she looked very ill, with temperature 103°, pulse 120. A slight amount of foul discharge was present in the left ear, but no swelling or tenderness over mastoid. Right optic disc was slightly swollen.

The patient was put under chloroform and the complete mastoid operation performed. The antrum, which was large, was full of cholesteatoma, the cells about the tegmen being large and full of pus. The middle fossa was exposed and explored, with negative result; the lateral sinus was laid bare and appeared healthy. After the operation the headache was relieved and she felt more comfortable. On May 3rd both optic discs were slightly swollen; temperature 103°. During the next few days temperature still remained up though the headache was not complained of. On May 8th temperature became normal; May 9th she was somewhat dull; on the 12th temperature, which had fluctuated for the last few days, reached 102°; she was more drowsy and took little notice unless spoken to; the eye symptoms remained unchanged.

On May 13th she was again put under chloroform, the posterior wall of the antrum between the lateral sinus and posterior semicircular canal was cut away, exposing the cerebellar fossa; this was explored and about an ounce of foul stinking pus was evacuated; two rubber drainage tubes were inserted. Temperature fell to normal and subsequent progress was uneventful. Drainage tubes were left out on April 20th; patient had increased in weight. She was discharged May 17th with everything healed. She could hear the whispered voice at some feet.

In this case, though there was nothing definite to indicate the nature or seat of an intracranial affection the operative findings showed the lateral sinus to be healthy. The condition of the cells of the tegmen suggested exploration of the middle fossa, but this was negative. As there were no urgent symptoms, further measures were postponed, and accordingly when definite signs of increasing intracranial pressure showed themselves the cerebellum was exposed through the posterior antral wall and an abscess evacuated. Ample room for drainage was found here.

CASE II.—*Cerebellar Abscess: Opened and Drained: Recovery.*

E. R., aged 18, a collier, admitted April 20th, 1907. Complained of pain in the right ear, which began five weeks before, and then extended to the back and side of the head. He stated he had never had discharge from the ear "until two weeks before," when it began in the right ear, and has since continued; he had headache, vomiting, and latterly diplopia. On admission he was drowsy, lay with the head retracted, being unable to flex it without pain. He answered intelligently; the pulse was 54, and temperature subnormal. Slightly fetid discharge from the right ear, which contained granulations. There was jerky nystagmus, which was not more marked on looking to either side. He complained of seeing double on looking to the left, and there was weakness of the left external rectus. There was considerable swelling of both discs, with engorgement of veins and some oedema of the retina.

On April 21st, twelve hours after admission, a complete mastoid operation was performed. The mastoid antrum was laid bare, and found full of cholesteatomatous debris, its outer wall being very thick and hard. The posterior wall was deficient, exposing the sinus and small part of the dura of the cerebellar fossa. This wall was further cut away up to the posterior semicircular canal. Through the space thus exposed

* This patient was shown at a subsequent meeting with excellent hearing in the affected ear.

the cerebellum was explored and 1½ drachms of thick pus evacuated. The sinus was further exposed for some distance and appeared healthy. Middle fossa was explored, with negative result. Pulse rose in frequency before the end of the operation.

On April 23rd he was free from headache, and could move the head better. On the 24th the wound was dressed and looked healthy. On the 25th he was much brighter, the retraction of the head had almost disappeared, nystagmus was noticed only on looking to the left; there was still diplopia on looking to the left, weakness of the left external rectus and squint. On May 5th the discs were still very swollen, veins engorged, and several small haemorrhages near the discs; he still complained of double vision on looking to the extreme left, and there was slight limitation of the movement of the left eye outwards.

By June 4th, when he was discharged, the external wound was healed, and the interior of the ear quite epithelialized. The movement of the left eye was quite normal, and the optic neuritis was clearing up slowly.

In this case the abscess was found behind an obvious "gap" in the posterior antral wall, and, cutting away the bone as far as practicable without interfering with the labyrinth, gave ample room for evacuation and drainage. An interesting feature in this case was the occurrence of crossed abducens paralysis. Such a condition has rarely been recorded, and its explanation is not very obvious. Possibly there was a certain degree of serous meningitis present which had extended to the opposite side. On the other hand affection of the sixth nerve on the same side is not infrequently met with in temporal bone suppuration, and has no special significance.

CASE III.—*Osteomyelitis of Temporal Bone: Cerebellar Abscess: Opened and Drained: Recovery.*

H. B., aged 1½, admitted March 21st, 1907. Complained of pain in left ear, headache, nausea, vomiting. He had been ill three weeks with severe pain in head, vomiting, and general malaise. His illness had begun with pain in left ear, which increased, and became general over left side of head. He had vomited several times.

On admission he was somewhat dull and apathetic, and looked ill; tenderness behind left ear, pulse 80, temperature 99.6°; eyes—optic neuritis in early stage; left ear membrane bulging, hearing only slightly affected, no discharge.

Operation same day; mastoid opened, periosteum over it fleshy and easily detached, bone of outer wall of antrum soft and gelatinous-looking at points, specially over posterior border of mastoid; cells of lower part of mastoid and the antrum contained granular-looking material. No pus was seen, except after completion of operation, when discharge, which was not there some hours earlier, was noted in the meatus. Pain was relieved, but returned two days later; patient somewhat dull; wound without reaction; ear passage was quite dry and membrane intact.

On March 26th optic neuritis had increased, leucocyte count had risen from 16,000 to 19,000. Chloroform was again administered, the large cells in tegmen opened up; they were very extensive, running up into squama; opened tegmen; explored mid-fossa, nil; explored sinus groove, healthy; explored cerebellar fossa through posterior wall of antrum, nil. Pulse and temperature fluctuating. Temperature 99° to 102°, pulse 80 to 112.

On April 4th the boy had emaciated more and complained of more headache the last two days; temperature went up to 101°, and optic neuritis was still more marked. Chloroform was administered and posterior part of mastoid explored, where bone was soft and periosteum now more swollen; on detaching periosteum still further back towards occipital bone found a sinus which led inside the bone. This was enlarged and bone removed around it; a small fistula found in dura; this, when enlarged and dilated by sinus forceps, gave vent to a quantity of thick, odourless pus; a probe passed behind lateral sinus into cerebellum downwards and somewhat forwards; a drainage tube was inserted.

After this the boy did well, and the general condition improved. On April 14th temperature rose to 100.4°, and he vomited twice; there was little or no pus in tube. On April 17th chloroform again administered; bone around opening bare and periosteum fleshy and unhealthy-looking; a small hernia cerebelli; smaller tube inserted deeper; optic neuritis continued to increase in degree; no further rise of temperature. On May 10th drainage tube left out. May 30th, note by Mr. Russell Thomas on eye condition: "Optic neuritis very marked in both eyes; small haemorrhages in retina and some oedema round discs." June 15th, discharged well.

This case presents some unusual features, and its result confirms the importance of following the disease into the skull. At the first operation the walls of the middle-ear cavities gave no indication of being implicated. When the probability of a collection of pus inside the skull increased, the exploration of both fossae, carried out from the walls of the antral cavity, was negative. The soft condition of the bone which attracted attention at the initial operation was then investigated, and following this back behind the sinus, a collection of pus was found in the cerebellum. It is probable that the osteomyelitic process infected one of

the occipital cells, which are occasionally large and well developed. Investigation with a probe showed that the abscess cavity struck deep into the substance of the cerebellum, and could not have been reached through a trephine opening in the usual situation without traversing a considerable tract of healthy brain. The case is unusual, and bears a resemblance to one recorded by Permewan.²

The diagnosis of cerebellar abscess presents as a rule great difficulty. Ten per cent. are completely latent, with no symptoms whatever. When symptoms are in evidence many of them are those met with in all cranial complications, and the clinical picture is so indefinite and capable of such varying interpretation that the diagnosis before operation cannot go beyond a mere probability. When the infection enters the posterior fossa by way of the lateral sinus we have the clinical aspect dominated by the urgent symptoms of sinus thrombosis and pyaemia. When it occurs as a result of disease of the labyrinth, the signs of a labyrinthine affection may overshadow those of cerebellar abscess, and the diagnosis becomes one of extreme difficulty. We have to decide whether the nystagmus which is present is labyrinthine or cerebellar in origin, and though much has been done in this direction by Barany³ and others, it cannot be said that the question is solved. In cases where brain symptoms are urgent, no time can be lost in waiting for a definite diagnosis, and operation must be undertaken forthwith. And it is in such cases that the data found at operation are of enormous help. The great advance in the treatment of intracranial complications depends upon the fact that we no longer wait until all symptoms of abscess have developed, because we know from experience that the prospects of any operative procedure are better in the early stages.

With regard to the prognosis, the rate of mortality is really higher than the textbooks indicate. Körner⁴ points out that an erroneous impression is given by the statistics hitherto published—founded as they are chiefly upon cases that have run a favourable course. He would now regard as germane to this point only figures from individual clinics or individual operators who record all cases operated on; or those which form at least a continuous series. Applying this method to his own and Schmiegelow's cases (the only available), of 16 cases of cerebellar and cerebral abscesses evacuated, 8 recovered, 8 died, whilst 14, mostly complicated by sinus phlebitis or meningitis, were either not discovered or in consequence of diagnostic difficulties were not suspected. Whitehead⁵ states that in *St. Thomas's Hospital Reports* during five years up to 1904 there are recorded 19 cases of temporo-sphenoidal abscess, of which 12 died, and 7 cases of cerebellar abscess, of which 6 died, and 2 cases of combined temporo-sphenoidal and cerebellar abscess, both fatal. At *St. Bartholomew's*, for the same period, 17 cases are recorded—the proportion of cerebellar and cerebral abscesses not being stated—of these 15 were fatal. At *Leeds Infirmary*, in six years, there were 10 cerebral, of which 5 died, and 9 cerebellar, of which 6 died, with 2 combined cases, both fatal.

The evacuation of a cerebellar abscess has been carried out in two ways, either from the surface of the skull through a trephine opening behind the sinus or from the middle ear cavities. The first method means selecting what is usually the longest route, inasmuch as it often passes through healthy brain tissue which becomes exposed to infection and gives trouble in drainage. In some cases, when, for example, respiration has ceased, there is no choice but to take it, for the condition of the patient demands that the abscess must be reached as quickly as possible. It is, however, to the adoption of the second route that we owe recent advance, based as it is upon the fundamental principle of attacking the primary disease in the temporal bone and then following it to the dura and into the brain. Körner⁶ pointed out some years ago that almost all otogenic brain abscesses lay very near the seat of the primary suppuration in the ear and temporal bone and frequently in conjunction with it, and he maintained that these anatomical relations showed the way by which otitic brain abscesses should be looked for. It is a sound surgical principle to follow the disease through the bone into the brain and to make evacuation of the abscess a continuation of the operation for removal of the bone disease.

For this purpose the mastoid process should be removed well into the posterior fossa, and the knee, as well as the

descending part of the lateral sinus, laid bare as far as is necessary. The state of the triangular area of bone between the sinus and posterior semicircular canal should be scrutinized, and if doubtful cut away and the dura underlying examined. Ample room will be found as a rule for exploration, and for evacuation of the abscess, as illustrated by Cases I and II. Sometimes more than one doubtful point may be revealed, and it may be impossible to decide the track taken by the disease, as in the case of a young girl under my care in whom an extradural abscess over the cerebellum and a defective tegmen antri were discovered. The evacuation of the former was followed by cessation of symptoms for nearly a week, and on their recurrence the mid-fossa was explored through the tegmen and a large abscess tapped. On the other hand, no obvious track may be visible; if the brain symptoms are not very pronounced one may wait further development, and this is frequently justified by the case clearing up. When the symptoms are definite, the cerebellum may easily be explored after exposing the dura.

In a boy under my care with very definite intracranial manifestations following chronic ear disease, I laid open the middle-ear cavities and examined the sinus, which however appeared normal. Though no track was seen in the posterior wall or tegmen the cerebellar and cerebral cavities were explored. From the former a considerable quantity of serous fluid under tension escaped. The mental state rapidly cleared up after this and recovery was uneventful.

The case was probably one of serous meningitis which might have resolved by simply laying bare the bone disease, but the symptoms were so pronounced that further measures were deemed advisable.

When the lateral sinus is diseased, it must be laid bare well beyond the limits of its involvement, opened up, and the thrombi turned out. If symptoms continue and a collection of pus in the cerebellum is suspected, exploration should be made along the track of the affected vessel. We cannot hope, through a trephine opening from the surface, to reach all points of possible infection. Where pus collects around the descending part of the sigmoid sinus, this may be feasible, but elsewhere a successful issue is in doubt, as is well illustrated by an instructive case published by Bönninghaus,⁷ where a thrombus close to the torcular gave rise to an abscess which escaped tapping.

In deeper-lying abscesses proceeding from affection of the labyrinth, the infection reaches the posterior fossa through the internal auditory meatus or the aqueductus vestibuli. They can be dealt with by cutting away bone along the anterior aspect of the cerebellum. By pushing aside the dura with an elevator an extradural collection may be reached, but in such cases disease of the labyrinth exists, and the operation should combine eradication of the disease, such as by Neumann's method of opening the labyrinth, with the evacuation of the abscess. If it is borne in mind that 45 per cent. of cerebellar abscesses are due to labyrinth disease, the importance of dealing with that region is obvious. Where signs of affection of the labyrinth are present, it should be opened. As Neumann points out,⁸ this is in obscure cases of great diagnostic help. Cerebellar abscesses originating in the labyrinth and purulent labyrinthine disease present frequently the same clinical picture, so that the question whether one or both conditions are present in a particular case, with signs of labyrinthine involvement, is extremely difficult to decide. In that event Neumann advises that the labyrinth operation should be carried out and the result noted. If there is no improvement in the symptoms the diagnosis of cerebellar abscess may be made.

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¹ *Trans. Otol. Soc.*, vol. vii. ² *Trans. Otol. Soc.*, vol. iv. ³ Barany, *Physiologie u. Pathologie des Bogenganges Apparates*, 1907. ⁴ Körner, *Otitischen Erkrankungen des Hirns*; Nachträge zur dritten Auflage, 1908. ⁵ *Loc. cit.* ⁶ *Otitische Erkrankungen des Hirns*. ⁷ *Zeitschrift f. Ohrenheilkunde*, Bd. liv, p. 245. ⁸ *Der otitische Kleinhirnsabszess*, 1907.

WE are asked to state that the bathing establishments and Associated Grand Hotels at Roncigno, South Tyrol, will be pleased to entertain a party of English general practitioners, who will be received by Dr. Waiz of Roncigno, and will also have the opportunity of visiting Campiglio. The visit will be paid at the end of August, and further particulars can be obtained from Mr. Galloway Kyle, 47, Fleet Street, E.C.

THE SCIENCE COMMITTEE OF THE British Medical Association.

REPORT CVII.

SOME COMPLICATIONS OF CHRONIC OTORRHOEA.*

BY

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CHRONIC otorrhoea is very prevalent, especially amongst the children of the poorer classes; it forms a very appreciable percentage of those seeking advice at the aural externs of our hospitals. In examining 1,000 school children drawn from the poorer classes in London, Cheate¹ found no less than 335 to be suffering from suppurative middle-ear disease in one or both ears.

Suppuration of the middle ear has been defined as "chronic"² when it has existed for more than six weeks; this is a useful though a somewhat arbitrary definition.

ETIOLOGY.

* The etiological factors in its production may be grouped under two headings: (a) Predisposing, (b) exciting. The predisposing are: (1) Malnutrition, such as that found in rickety, tuberculous, or marasmic subjects; (2) pathological conditions of the nose and naso-pharynx, due to nasal obstruction and adenoids; or to the exanthemata, such as measles, scarlet fever, or diphtheria. In many children, particularly of the poorer type, there is a continual running at the nose, and this catarrh will lead to swelling of the nasal mucous membrane, and so to nasal obstruction. Adenoids are one of the commonest causes, their presence maintaining continual naso-pharyngeal catarrh, which, by spreading along the mucous membrane lining the Eustachian tube, carries the inflammation into the tympanum.

A boy, aged 8, was brought to me early last April for a right-sided otorrhoea of about two years' duration. As there were other symptoms of adenoids present, these growths were removed prior to commencing treatment on the ear; but when seen on April 22nd the discharge from the ear had entirely ceased, so that no local treatment for the otorrhoea has been necessary.

Frequently the discharge dates from an attack of measles or other fever. In quite young children the onset often coincides with the period of teething, so that its incidence is sometimes ascribed to this condition.

The exciting cause is probably the reaction of the lining mucous membrane to the deleterious effects of micro-organisms, which ascend to the tympanum from an inflamed naso-pharyngeal mucous membrane by the Eustachian tube, or perhaps gain entrance by the blood stream or lymphatics, and there set up an acute inflammation, for in nearly every instance the chronic otorrhoea has been preceded by acute otitis media, which has subsequently become chronic. Many different micro-organisms have been found in the discharge, but those most frequently seen are the pneumococcus, *Streptococcus pyogenes*, and the tubercle bacillus; to the last must be ascribed a large proportion of cases, especially amongst hospital patients; indeed Milligan³ states that 50 to 60 per cent. of his hospital patients who had not yet reached 6 years of age were due to tuberculous disease. Of the other organisms, the pneumococcus apparently evinces a preference for young subjects, for in a clinical examination of a series of cases,⁴ the *Streptococcus pyogenes* was found in 50 per cent. of all cases, but only in 30 per cent. in those under 10 years of age, whereas the pneumococcus was present in 18 per cent. of all cases, but in no less than 85.7 per cent. of those under 10 years of age.

ANATOMY.

The middle ear, or tympanum, is situated in the interior of the temporal bone, and the walls of the cavity are osseous except the external, the larger part of which is formed by the tympanic membrane or drum. Lining this cavity is a delicate mucous membrane containing blood vessels,

* Delivered before the Ulster Branch of the British Medical Association at Londonderry, May 2nd, 1908.