and in two cases the aural reflex produced by touching the entrance to the external meatus was absent. It is to be emphasised that this area of hyperæsthesia corresponds to the zoster zone for the geniculate ganglion.

In conclusion, the author expresses his belief that the sensory symptomatology of the seventh cranial nerve deserves an established place in the *nomenclature*, and that this sensory system, although small in area, is of great importance because of its relation to the highly developed and very sensitive auditory mechanism.

SOCIETIES' PROCEEDINGS.

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SECTION OF OTOTOLOGY (AND INTERNATIONAL CONGRESS OF OTOTOLOGY).

(Continued from p. 389.)

HISTOLOGY AFTER FUNCTIONAL EXAMINATION OF THE EARS.

BY RUDOLF PANSE (Dresden, Neustadt).

Necrosis of the cochlea causes complete deafness. Differential diagnosis between disease of the auditory nerve and of the labyrinth cannot be made by examination of the hearing. In both conditions the most certain sign is shortening of the bone conduction. A whisper may still be heard after degeneration of Corti's organ, and high notes after loss of the basal ganglia. Corti's organ may be unaffected in cases of complete deafness. Complete deafness may be present where the labyrinth is normal but both tympanic windows are closed.

THE CHANNELS OF THE PROPAGATION OF INFECTION FROM THE MIDDLE EAR INTO THE INTERIOR OF THE CRANIUM.

BY DR. J. MOURET (Montpellier).

The middle ear, through its pneumatic annexes (the mastoid and intra-petrous cells), may extend into nearly the whole of the

temporal bone, isolating the labyrinth from the superficial osseous shell, as well as from the petrous pyramid. This disposition of the pneumatic apparatus accounts for the extension, sometimes so rapid, of the infection from the tympanic cavity to the most distant parts of the mastoid and of the petrous bone.

Suppuration of the middle ear may penetrate into the cranium either by passing through the walls of the tympanum or of its pneumatic annexes.

Channels from the Middle Ear.—(1) Bony dehiscences; (2) lesions of the internal table of the bone; (3) anatomical apertures for arteries, veins, or nerves which communicate between the middle ear and the cranial cavity; (4) the route through a vein or sinus; (5) ready-formed channels, the aqueduct of Fallopius or the petro-mastoid canal. Perforation of the bone and venous infection are the two commonest means by which suppuration of the middle ear passes into the interior of the cranium. Perforations are situated by preference where the internal table of the bone offers least resistance either under normal conditions, the roof of the tympanum, or of the tympanum and the antrum, or the floor of the tympanum, or else by the formation of large cells, where the pus easily stagnates on account of their size and of their dependent position (perisinus wall, posterior wall of the petrous bone).

The Channel through the Internal Ear.—The infection may reach the internal ear, in the first place, and pass from there into the cranial cavity—(1) by dehiscences (rare); (2) through lesions of the osseous capsule of the labyrinth; (3) through the anatomical apertures for the passage of the auditory nerve and of the arteries and veins of the internal ear; (4) by the intra-venous route; (5) by pre-existing channels, viz. the aqueduct of the vestibule and that of the cochlea; (6) by routes improperly called lymphatic (the lymph-vessel of the aqueduct of the cochlea, small channels passing from the saccus endolymphaticus, the peri-vascular sheaths of the internal auditory artery).

The advance of the infection into the interior of the cranium may take place—(1) directly, by continuity of the lesions from organ to organ; (2) by intra-venous propagation (thrombosis, or pathogenic germs carried by the blood); (3) by diffusion of infective germs into the spaces of the cranial cavity.

Propagation of the otitic infection into the interior of the cranium by lymphatic channels does not exist.

ON THE INDICATIONS FOR OPERATIVE TREATMENT OF SECONDARY SUPPURATIVE LABYRINTHITIS AND ITS TREATMENT.

BY DR. E. SCHMIEGELOW.

The paper is based upon the experience of forty-two cases of labyrinthitis consecutive to purulent lesions of the middle ear.

Ten cases with circumscribed labyrinthitis, either partial or severe, were cured after opening and evacuation of the cavity of the middle ear. In the other thirty-two cases there was diffuse suppuration of the labyrinth with complete deafness.

The operation on the labyrinth is not indicated in all cases of secondary lesions of the labyrinth. The indications for an operation on the labyrinth do not depend solely on functional tests, but also on the advance of the disease, and on the direct examination of the labyrinth wall after the radical operation.

The treatment of secondary labyrinthitis consists sometimes in a thorough prophylaxis, and sometimes in an operative opening of the labyrinth cavities.

The opening of the labyrinth can be performed in different ways. The operation recommended by Jansen and Neumann should not be the principal method. It is a difficult and deep operation, and should only be resorted to when there is reason to suppose that, besides the affection of the labyrinth, there is suppuration in the posterior cranial fossa. The labyrinth can be opened by means of the burr, but the author prefers the gouge and mallet, which allows a more certain mode of working and a better guidance of direction. The method proposed by Uffenorde guards against accidental injuries of the facial nerve. The facial nerve is exposed by cautiously opening the facial canal so as to lay it bare, then the semi-circular canal, the vestibule, and the cochlea are opened. Thus the whole labyrinth can be removed while making every effort to preserve the facial nerve. At the end of the operation the nerve can be seen passing down free in the resected cavity.

In 22 of 32 cases of diffuse purulent labyrinthitis the treatment consisted only in the radical operation on the middle ear. Of these 22 cases, 2 died of complications preceding the operation. Of the 20 remaining cases, 2 died, whilst 13, or 65 per cent., recovered. In 10 cases the labyrinth was opened. In 7 cases a cure was obtained, but 2 patients died of complications dating from before the operation, and 1 of meningitis, which broke out seventeen days after the operation.

CONCERNING VENOUS CONGESTION IN DISEASES OF THE EAR.

BY DR. SPIRA (Krakau).

Most authors are opposed to this method of treatment. A minority, to whom the writer belongs, believe that the method can be of value if carried out with care and under proper observation. He is of opinion that there is no doubt that an operation, which would otherwise have been necessary, may be avoided in many cases of acute middle-ear suppuration by the use of venous congestion. It is, however, right not to limit oneself to the use of congestion, but also to combine this with aspiration. A suction apparatus is applied over the mastoid process, or previous to its application an incision may be made through the soft parts. A so-called apparent cure used also to occur after the ordinary methods of treatment, where an affection of the mastoid process suddenly appeared long after cure of the middle-ear inflammation. To avoid such disappointment it is advisable not to consider the patient cured till all symptoms, subjective and objective, have disappeared and the drum membrane has regained its normal appearance, and also the hearing has correspondingly improved. Intermittent appearance of fever, continued or recurring tenderness over the mastoid process, delay in the return of the membrane to its normal appearance, lack of marked improvement in the hearing, and so on, should suggest the possibility of a focus of disease in the depth of the mastoid process necessitating operation, in spite of disappearance of suppuration and a feeling of well-being. In chronic cases the method may be of value where there is no caries or cholesteatoma, but as a general rule much cannot be expected of it. In acute cases it is contra-indicated where there is a suspicion of an intra-cranial complication, or of infection of the labyrinth in cases of cholesteatoma, or in cases of severe general infection.

Prof. SCHWARTZE said that the experiments in his own clinique, as well as the reports of even those who defended this method of treatment, had shown that it was not worthy of adoption on account of certain dangers which followed its use. The abolition of pain consequent upon the venous congestion concealed the dangers of the disease, so that the necessary operations were not undertaken until it was too late.

Dr. HOLINGER (Chicago) said that the congestion treatment had not taken the place of the older methods of treating acute middle-ear inflammations with ice, etc. With regard to the treatment by suction, on the other hand, the results were better, as was shown by a case which he related. But caution was necessary with this also, for in one of the cases where he had used suction without any benefit, the radical operation disclosed the fact that the sinus was exposed to the extent of 2 cm. In

another case he considered that the treatment had prolonged life for a year. The case was one of a woman with acute otitis media and symptoms of meningitis, headache, insomnia, rigidity of the neck, etc. Suction led to an amelioration of all the symptoms in the course of four weeks. A year later a second acute attack took place and caused death in two days. The *post-mortem* showed a dehiscence in the tegmen tympani from which thin pus was exuding. Dura and pia showed scars at this spot. The base of the cerebrum was swimming in pus and the cerebral substance was everywhere reddened. That is to say, the scars indicated that the first attack was in reality one of meningitis, which had been cured by the suction. The new suppuration had struck immediately through the scar to the base of the brain. Suction was then unavailing, because the scar occupied the dehiscence. Whether an operation would have helped the patient was doubtful. The last attack was too fulminating to be relieved by this means; but the first might have been cured had operation been carried out promptly.

Dr. FLEISCHMANN (Budapest) agreed entirely with Prof. Schwartz. The Bier treatment transformed a manifest into a latent mastoiditis, and led to fatal delay in operating.

Dr. WANNER (Münich) said that the Bier treatment made operation more necessary, and could only be recommended to surgeons who were anxious to operate.

THE PROGNOSIS AND TREATMENT OF OTOGENIC PYEMIA, SINUS PHLEBITIS, AND SINUS THROMBOSIS.

BY DR. V. UCHERMANN (Christiania).

With reference to the treatment of sinus phlebitis and sinus thrombosis, it must be remembered that the terms are not synonymous. Thrombosis is always a result of phlebitis, but the latter need not necessarily be accompanied by thrombosis. Phlebitis has, however, been nearly forgotten in the consideration of thrombosis.

The thrombi never spread further than the inflammation of the wall, and in addition require a relative stagnation of blood. A slowing of the blood-stream can only occur through swelling of the sinus wall, occasionally along with external pressure, and not through the growth of an adherent thrombus. The swelling is usually found in the genu, sometimes also below it and in the bulb, or in those areas alone. On the brain side of the narrowing thrombi can always be found as far as the inflammation of the wall extends. Towards the heart it will depend on whether the blood has had time to flow away or not, and on the presence or position of tributaries. At every point in the inflamed and thickened wall the swelling may become so great that the lumen is obliterated. This explains naturally the intermittent appearance of thrombi. If the wall of the jugular vein is found to be collapsed at the operation a thrombus may well be found nearer the heart, but if

the wall of the vein appears healthy it may be decided practically with certainty that the vein-wall is also healthy further down, and that no thrombus is present. It is unnecessary to look for one. The treatment must be conducted in accordance. Grünert's operation is necessary only in the severest cases. Vass's operation is unsatisfactory.

THE QUESTION OF LIGATURE OF THE JUGULAR IN INFECTIVE SINUS THROMBOSIS.

BY DR. TÖRÖK (Budapest).

Dr. BÁRÁNY advised the introduction into brain-abscess cavities of an elastic drain in order to avoid pressure upon the surrounding tissue.

Dr. RUTTIN remarked that two different views had been laid before them—the one by Dr. Uchermann, who did not tie the jugular and cleared the sinus out, and the other by Dr. Török, who did tie the jugular and did not clear out the sinus. Such differences were, as a rule, bad signs for a method of treatment. This, however, did not hold good with reference to tying the jugular, the differing opinions upon which, he thought, arose from people expecting too much of it. All that could be looked for was that ligation of the vein would hinder pyæmia, unless metastases had already appeared. If, however, metastasis had already taken place, the effect of ligation was, of course, not certain, although the literature contained many reports of cases with metastasis which had got well. Thus we might take up the position of advocating evacuation of the sinus whenever it contained a thrombus. Besides, no one could say when a thrombus was sterile and when it had become infected. In the same way, also, no one could say whether or not a portion of the thrombus had become detached. He could recall many cases where the jugular was normal, and only the sinus was diseased, in which, nevertheless, metastasis had occurred.

Dr. ALEXANDER (Vienna) remarked that cases of sinus thrombosis in children were very uncommon, and he believed that the slight cases mentioned by Dr. Uchermann represented nothing more serious than acute otitis with high fever and rigors, but in other respects free from complication. The insertion of tampons between the sinus and its bony wall was to be deprecated. In like manner, pressure, careless probing, and all such manipulations should be avoided, since they were liable to induce acute purulent meningitis. Apart from unusual cases, our operations should be so planned as to avoid the necessity for repeated interference. Every fresh interference made the prognosis worse by favouring the degeneration of the cardiac muscle and of the large glands. He also advocated the removal of the obstructing ends of a thrombus, for these ends were frequently infected and filled with masses of bacteria.

Prof. JANSEN said that in brain-abscess he was accustomed to make the incision so large that the whole abscess was laid open, and then drainage was quite easy. There were affections of the sinus which were quite circumscribed, genuine abscesses, and for their cure a free incision of the sinus was all that was required. Ligation of the jugular was, however, necessary as soon as the sinus disease had extended.

Dr. FREY referred to the danger of sinus infection as constituted by

the advance of the disease to a structure which belongs to the circulatory apparatus. The exclusion of this structure from the circulation by operation removed the danger. On that account the jugular should be attended to on the first appearance of pyæmia.

Dr. UCHERMANN, in reply, said, with reference to Dr. Alexander's criticisms of his cases, that he could point to *post-mortem* examinations in proof of the presence of real pyæmia, as well as to the results of operation. Regarding ligation, he had already said that it was only required if blood was still flowing through the vein. We were also compelled to do so if, in spite of previous interference, the pyæmia continued. He also held that bacterial and toxic absorption could be effected through lymphatic as well as through vascular channels.

NEW FACTS CONCERNING THE PROBLEM OF THE OPERATIVE OPENING
OF CONGENITAL ATRESIA OF THE EXTERNAL AUDITORY MEATUS.

BY DR. E. VÁLI (Budapest).

The author attempts to show by the aid of embryology that the sound-receiving and sound-conducting apparatus develop independently of each other at different places and at different periods. He shows that in an atresia of the external sound-conducting apparatus the sound-perceiving apparatus may be quite intact, hence a decision as to operative interference is not to be influenced by the results of the examination of the hearing. Text-books have, however, till now laid great weight just on this point. The author hopes that by means of X-ray photographs it will be possible to demonstrate the position and degree of the atresia. Finally, he lays down the following indications for operation:

(1) An atresia should invariably be operated upon for prophylactic reasons quite apart from the expected improvement in the hearing—*indicatio vitalis*.

(2) As every atresia is not due to incomplete development of the tympanic plate, it is our duty to seek to open the atresia first along the normal path; if this fails we must make a passage in the mastoid process down to the tympanum. In these procedures X-ray photographs will be of value.

(3) The operation should be performed if possible at an early age.

(4) The operation is indicated in unilateral and bilateral atresia.

Dr. NEUBAUER had experimented with X-rays in the diagnosis of certain diseases of the ear, and among other cases examined was one of congenital occlusion of the meatus, in which the X-rays showed the presence of a meatus.