cochlea, and to incise the dura), I would like to answer that about fifteen years ago I made the suggestion to open the vestibule and cochlea widely where they are diseased and there is indication for operation. I have often described both the operation and the methods. In the course of years I have learned to restrict my operation to a portion of the labyrinth, and to individualise in my operations, whereas Neumann always opens the entire labyrinth. Even though he has made a few unimportant modifications upon my operation, the operation can hardly be called his own. The next few years will decide whether my present standpoint is the proper one, namely to individualise, or Dr. Neumann's standpoint, to generalise and open the entire labyrinth. I do not make an incision in the dura in every case.

In reply to Dr. Harris, I would like to say that I have often observed cases with labyrinthine symptoms before the radical operation heal without an operation on the labyrinth. In the majority of cases changes in the middle ear probably cause a reaction in the vestibular region. I do not operate on every case with labyrinthine symptoms. I have laid particular stress upon the infections and progressive character of the labyrinthine affection. On account of a too conservative attitude, and too late an operative interference, I lost one case. It is very difficult to draw the line between the cases which ought not and the cases which ought to be operated upon.

AUSTRIAN OTOLOGICAL SOCIETY.

June 22, 1908.

PROFESSOR ADAM POLITZER *in the Chair.*

EXHIBITION AND DISCUSSION OF CASES ILLUSTRATING "VESTIBULAR NYSTAGMUS."

V. URBANTSCHITSCH showed a case of *tubercular disease of the middle ear;* tubercular pulmonary lesions were also present. Before operation the range of hearing for conversation was two metres, and for whispers half a metre. There were symptoms of a fistula. A marked rotatory and horizontal nystagmus, directed towards the diseased side, occurred even by pressure on the tragus,

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and was intensified by raising the air-pressure in the meatus, whilst lowering the air-pressure produced a nystagmus directed towards the healthy side, but of a weaker character. Stooping and quick movements of the head also induced nystagmus and giddiness. The caloric reaction was maintained. A fistula of the semi-circular canal was diagnosed, but, as the hearing was as noted above, the labyrinth operation was not undertaken. On account of the co-existing lung disease a radical operation was carried out under local anæsthesia as recommended by Neumann, and revealed a large fistula in the semi-circular canal with a sequestrum fixed above it between the dura and the petrous bone. As this sequestrum was being seized and removed with some difficulty, the patient experienced a feeling of giddiness and felt a "twitching" of the eyes (? nystagmus), but immediately after the removal the giddiness disappeared, and he felt much relieved. Pressure now over the fistula did not produce nystagmus. For a short while after the operation a rotatory nystagmus directed towards the sound side was observed, which gradually disappeared.

The patient is now totally deaf and the caloric response very much diminished. The spontaneous giddiness has disappeared.

Urbantschitsch leaves the question open as to whether the symptoms were due to the pressure of the sequestrum on a second fistula in the superior canal, or whether the giddiness at the moment when it was extracted was referable to irritation of the dura.

Urbantschitsch also made some remarks on the results of a *post-mortem* examination in the case of a woman who had died from the effects of a purulent meningitis of otitic origin. The patient had come to his clinic with no symptoms worthy of comment. She had a chronic purulent discharge from the middle ear. At the operation the posterior and middle fossæ of the skull were found covered with a purulent discharge, as was also the sinus. As the temperature was considerably raised an opening was made in the dura and some purulent serum evacuated. An incision was also made into the brain but no pus found. The radical operation was performed. The first day after the operation the patient's condition was good and there was no headache. On the second day slight frontal pain occurred, which was rapidly followed by coma and then death. The temperature rose considerably after death. At the *post-mortem* purulent meningitis was revealed and a purulent thrombus found in the superior petrosal sinus. The discrepancy between the very slight clinical symptoms and the fulminating character of the meningitis was remarkable.

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Bárány brought forward a patient who had been submitted to operation on account of a *chronic purulent ear discharge* and the presence of a *fistula in the labyrinth*. The interest in the case lay in the fact that before the fistula had developed the patient had been carefully examined in the clinic. The examination was carried out by Dr. Kiproff, who at the time was making accurate notes respecting caloric nystagmus. Dr. Kiproff had noted that at the first examination the nystagmus, after syringing with water at 30° C., had commenced in fifteen seconds, and lasted for two and a quarter seconds. On the healthy side the nystagmus had begun in ten seconds, and lasted three minutes. After ten revolutions the nystagmus towards the diseased side lasted fifty-five seconds, and towards the healthy side forty seconds. No symptoms of fistula. Eight days after this examination the patient came complaining of giddiness, which had commenced suddenly three days before. Considerable giddiness occurred either on walking, quick movements of the head, or on stooping, and when the head was held backwards an undoubted nystagmus appeared directed towards the diseased side. In testing for the presence of a fistula, raising the air-pressure produced a marked nystagmus towards the diseased side, whilst lowering the air-pressure evoked a weaker nystagmus towards the healthy side. There was no spontaneous nystagmus. Syringing the healthy ear with water at 30° C. caused a nystagmus in fifteen seconds which lasted three minutes, whilst on the diseased side it commenced in fifteen seconds and lasted two and three quarter minutes. After revolution the nystagmus lasted forty seconds towards the diseased side and forty-five seconds towards the healthy side.

An examination made three days later showed: The caloric nystagmus on the diseased side began in ten seconds and lasted three minutes, on the healthy side it began in fifteen seconds and lasted two and a half minutes. Revolution showed a nystagmus towards the diseased side of one minute, and towards the healthy side of forty-five seconds. Fistula symptoms as before. A radical operation revealed an undoubted fistula in the canal. After the operation a nystagmus towards the healthy side appeared, hearing was lost and the irritability of the vestibule markedly lessened.

The case is accordingly of great interest, since it is the first instance of an accurate examination and testing of the cochlear and vestibular apparatus having been carried out before the spontaneous development of a fistula.

Bárány submitted that this case showed that with the occur-

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rence of a fistula there may develop an abnormal irritability of the vestibular apparatus, which is evidenced by giddiness (both spontaneous or as the result of movements of the head), but that a hyper-excitability, as is asserted by Alexander to be always present in these cases, does not take place. That a physiological hyper-excitability exists, due to the vestibular apparatus responding more actively to physiological stimuli, was regarded by him (Bárány) as extremely doubtful.

In connection with this case Bárány referred to the results obtained by Urbantschitsch recently in the Ear Clinic at the University. One hundred and sixty patients were examined before operation as to the presence of symptoms of fistula. Of these 145 showed no symptoms, and in none of them was a fistula found at the operation. Bárány knew of no case himself in which, after an unbiassed examination, no evidence of a fistula was found, and in which at the operation one was subsequently discovered. All these cases also showed a typical caloric excitability. In four cases in which no fistula symptoms were present the caloric excitability was negative. In eleven cases symptoms of fistula were found before the operation, nine of which up till now have been submitted to operation, and a fistula in the canal found in all. Six of these showed very marked symptoms of fistula, such as obvious nystagmus resulting from variations of air-pressure. The caloric excitability was normal in these cases. The hearing was certainly preserved in some cases, but in others there was complete deafness. In three of the cases fistula symptoms were only slight, viz. in place of a nystagmus only a quite small rotation of the eyeball, always occurring in one direction when the air-pressure was raised, and in the other when it was lowered. In all of these cases the caloric excitability was either strongly diminished or increased, and complete deafness was present. Accordingly these symptoms may be regarded as perfectly trustworthy. It had happened that up till now Bárány had only seen cases of fistulæ in the canals, and in most of these he had noted nystagmus directed towards the diseased side when the air-pressure was raised, but he had found some exceptions to this rule.

In the year 1906 Gradenigo reported to the Italian Laryngological, Rhinological and Otological Society the results of some investigations which Dr. Mimidian had carried out in his clinic. Dr. Mimidian had tested a number of cases in respect of the effect of variations of air-pressure in the external auditory meatus. He noted that a nystagmus occurred equally both when the

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pressure was raised and also when it was reduced, and that it was especially noticeable whilst the air-pressure was being altered. Gradenigo drew no further conclusions from these observations. His account, however, had been the cause which had prompted Bárány to systematically test for fistula symptoms. From these examinations Bárány was able to state that when raising the air-pressure produced nystagmus, a nystagmus directed towards the opposite side was called forth by lowering the air-pressure. The results which Dr. Mimidian had found, he considered, were due to thermal effects which were dependent on an incomplete closure of the meatus and the current of air passing in and out thereby, when an attempt was made to raise or lower the air-pressure.

In January, 1908, an article by Alexander and Lassalle on "The Clinical Aspect of Labyrinthine Nystagmus" appeared in the *Wien. klin. Rundschau* (Year 22, Nos. 1 and 2). In the April number of the *Monats. f. Ohrenheilk.* an article by Mackenzie was published, in which occurred a list of the cases already published by Alexander, two further cases being added. In all of these Alexander had observed symptoms of a fistula, but subsequently no fistula was discovered. These cases Bárány considered were all, most probably, instances of a fistula in the stapes or of a perforation in the round window, to which conclusion he had arrived either (*a*) from the details of the history which was given, (*b*) from the description of the symptoms of the fistula, or (*c*) from the account of the course of the case after operation.

Case 1.—Before the operation repeated attacks of giddiness. In testing for the presence of a fistula an undoubted rotatory nystagmus directed towards the diseased side occurred when the air-pressure was raised, and towards the sound side when it was lowered. Immediately after the operation an acute labyrinthitis appeared.

Case 10.—A thirteen-year-old boy; chronic purulent discharge on both sides. By forced raising of the air-pressure in the right meatus a rotatory nystagmus was produced towards the right, and by a slight raising of the air-pressure in the left meatus a marked rotatory nystagmus occurred towards the left. No report was given as to the effect of lowering the air-pressure. The asymmetry of the nystagmus on the two sides is best explained by the assumption of a fistula in the stapes on the left side.

Case 11.—Both before and after the operation marked attacks of giddiness. Facial paralysis. Raising the air-pressure in the diseased ear evoked a rotatory nystagmus towards the diseased side.

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In all these cases one must assume a fistula of the stapes, since Alexander found no fistula in the semi-circular canals. At all events the other supposition cannot be entertained.

In addition to these there are three other cases in which Alexander observed a rotatory nystagmus directed towards the sound side when the air-pressure was raised. In one case which was submitted to operation there was no giddiness either before or after the operation.

A perforation in the tympanic membrane closed under treatment in two cases, and in these no nystagmus appeared on raising the air-pressure after this closure had taken place. Bárány considered that these symptoms were in reality dependent on thermal effects produced by the repeated passage of a current of air in the meatus, just as indeed catheterisation of the Eustachian tubes may also in isolated instances give rise to a caloric nystagmus.

In conclusion, Bárány referred to a case in which Leidler had confused the symptoms of fistula with the nystagmus described by Stransky. The patient had been brought forward at the last meeting, and was a case in which Leidler had made an incision into the dura. At the meeting Leidler had made no reference to any "compression" nystagmus, or he (Bárány) would have directed attention to this point.

Leidler had said in the account of the case that a nystagmus occurred on both sides when the air-pressure was raised in either ear. He (Bárány) happened to have had the opportunity of examining the patient two or three days before, and had observed that the associated nystagmus of Stransky was easily evoked. He demonstrated to the audience how easy it was in this case to confuse such nystagmus with symptoms of a fistula. In this case a fairly well-marked oscillatory nystagmus with synchronous movements of the lids occurred, not only by raising or lowering the air-pressure, but also by mere pressure on the mastoid process or on the tragus, or by pinching the eyeballs without any other stimulus. That such a skilled observer as Leidler should have been able to fall into such an error appeared to him (Bárány) ample evidence of the difficulties met with in these cases.

In Alexander's cases it was nearly always a question of "compression nystagmus." Bárány, however, contended that one could diagnose a fistula only if compression evoked a nystagmus in one direction and aspiration in the other. In this connection he would like to direct attention to a small detail. Aspiration should be made immediately after the column of air in the meatus had been

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compressed, without first removing the end-piece of the instrument from the meatus, for this reason: during compression the movable parts in connection with the fistula will be driven in towards the labyrinth, and thus cause a movement of the endolymph. If now aspiration is induced these parts will not only return to their original position, but will be even drawn further outwards. In this way a greater effect will be produced than would occur if after compression the end-piece were removed and the movable structures in the neighbourhood of the fistula allowed to gradually return to their original position before aspiration is commenced; and also a much stronger force will be required to obtain the same result.

He also alluded to one other point mentioned by Alexander in his article. Alexander had not been able to observe any symptoms of fistula in 20 normal cases, but said that he previously had sometimes produced attacks of giddiness whilst carrying out Gellé's test. He had said "giddiness during the application of Gellé's test on normal patients seems to occur especially when the external meatus is not rendered perfectly air-tight. The noise made by the escaping air and the movements of the patient's head may explain the occurrence of giddiness in these cases." From this statement Alexander shows that he had made an inaccurate application of Gellé's test, for if the outer ear is not made air-tight it becomes a simple blowing in and out of air, and the patient will naturally hear nothing. Moreover, it is obvious by the continued repetition of such an experiment a caloric nystagmus will be induced.

Bárány then referred to a communication made by Jansen at the Fourteenth Congress of the American Laryngological, Rhinological, and Otological Society at Pittsburg in May, 1908, which was the result of fifteen years' experience of the treatment of purulent labyrinthitis. Jansen had an extraordinarily large number of cases through his hands, which, however, were not approached in an altogether unbiassed frame of mind. Latterly Jansen had adopted the caloric tests for the vestibular apparatus, but he does not appear to have known anything of the symptoms of fistula. At least Bárány had been unable to find any mention of it in his work. "Stapes luxation" played a great part in these cases. If these cases were compared with the cases of so-called "serous labyrinthitis," as described by Alexander and Voss, certain points of resemblance were found. In these cases nystagmus and giddiness did not occur directly after the injury, but twelve to twenty-four

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hours afterwards, or even later still. Jansen had observed nineteen such cases, of which only two had recovered without the labyrinth operation. Luxation of the stapes happened only six times during the radical operation and twelve times during the after-treatment, and notably during curettage. Thirteen cases were submitted to the labyrinth operation; in nine cases cure resulted. The principal difference between Jansen's cases and those of Alexander lay in the high mortality of the former, whilst all those of Alexander and Voss recovered. Jansen said quite correctly that one could apparently obtain a response to the caloric tests on the first and second days, and that therefore the reaction to the caloric test was not a certain evidence of a purulent condition of the labyrinth. Bárány supposed that the differential diagnosis between stapes luxation and serous labyrinthitis might be carried out by testing for symptoms of fistula, either by the adoption of a sterilised rubber cup which could be accurately adjusted over the whole wound, or by the direct application of a small tampon to the area of the stapes. If there was no fistula symptom before the operation, and afterwards such appeared combined with a maintained or only somewhat reduced caloric excitability, it was a case of stapes luxation and not one of serous labyrinthitis. If, however, fistula symptoms were then lacking and the caloric excitability were maintained one could diagnose serous labyrinthitis. In practice this deduction was of great importance, since, if we are able to diagnose serous labyrinthitis by reason of the continued caloric excitability, the labyrinth should not be disturbed, but if it were a case of luxation of the stapes then the labyrinth operation should be performed. He added, however, that a serous labyrinthitis which had caused loss of hearing and a lack of excitability of the vestibular apparatus could not be distinguished from a purulent condition with similar functional deficiency; but he considered that even those cases are better if submitted to operation.

Neumann considered that a serous labyrinthitis could be distinguished from one of a purulent character by investigating the condition of the hearing. If, although conversation could not be heard, the tuning-fork, either *viâ* the air- or by bone-conduction, could be heard on the diseased side, he diagnosed serous labyrinthritis. Jansen spoke in his work of a fifteen years' experience in cases of purulent labyrinthitis. He had made, however, a very incomplete test of the condition of the hearing, and had only adopted the caloric tests for nystagmus during the last year. His reports, therefore, rested on incomplete data from a clinical point of view.

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ALEXANDER remarked that he always made use of compression and aspiration. The production of a thermal nystagmus under these circumstances he did not think occurred. As regards the giddiness which took place in some normal cases during the application of Gellé's test, he considered that this was not really so much a true giddiness, but rather a feeling of discomfort brought about by the unpleasant sensation in the ear. He thought that the main point of differentiation between serous labyrinthitis and luxation of the stapes lay in the fact that the symptoms did not appear till some two or three days afterwards in the first case, but in the stapes luxation they became evident sooner.

RUTTIN had examined a large series of cases of purulent labyrinthitis histologically. Stapes luxation was very rare. Serous labyrinthitis certainly occurred. He considered that Jansen's account contained many inaccuracies.

HAMMERSCHLAG did not agree with Neumann's view that the condition of the hearing formed a means of distinguishing serous from purulent labyrinthitis, and especially took exception to the statement that the power of perception by bone-conduction on the diseased side was of value. Patients in whom the cochlea had even exfoliated could hear the tuning-fork on the diseased side if it were applied to the mastoid process of that side. The large number of cases of deaf-mutism resulting from meningitis, with "islands" of hearing still remaining, supported the view that such remnants of this faculty might also persist in cases of purulent meningitis.

BÁRÁNY, in reply, did not agree that the condition of the sense of hearing was of value in the early stages of labyrinthitis, and reminded Neumann of a case which they had both had under observation and which for the moment must have escaped his (Neumann's) memory. This was a woman who had died two days after the extraction of the malleus and incus from acute labyrinthitis and meningitis. The first day after the operation she could hear conversation at six metres, but twelve hours later complete deafness ensued. By investigation with his "noise" apparatus he had shown that the hearing of the tuning-fork in the diseased ear *cid* the mastoid process on that side in cases of one-sided deafness is only an apparent condition, since if his "noise" apparatus were applied to the sound ear the very loudest tones obtainable by application of the tuning-fork to the mastoid process of the diseased side were not then appreciable.

FERDINAND ALT showed a boy, aged seven, who had a *complete*

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facial paralysis the result of an operation in a children's hospital in December, 1905. Alt had seen him in April, 1907. There was an opening behind the ear in the mastoid process in which necrosed bone could be seen. The radical operation was performed on May 3, 1907, at which a sequestrum representing the whole of the remaining mastoid process was removed. The facial paralysis did not recover after the operation. Conservative treatment was adopted for five months. On October 17 the wound was again explored, and the course of the facial nerve investigated by the method recommended by the exhibitor. At the point where the nerve turns downwards a sequestrum was found which reached outwards on to the prominence of the semi-circular canal and surrounded the outer and lower walls of the Fallopian canal. The removal of this sequestrum, which had exercised a pressure on the nerve, exposed the latter for some 8 mm. in its course. In a very short time after the operation the facial paralysis had disappeared. Complete power was now present in all branches of the nerve.

Alt also showed a girl, aged nine, in whom facial paralysis had occurred on the right side after a radical operation four years ago on the other (?) side. The cause of this was the involvement of the nerve in scar-tissue in the Fallopian canal. The paralysis here also rapidly recovered after operation. (A detailed account appears in the *Monatsschrift*.)

Ruttin regarded these cases as open to question if the galvanic reaction had not been ascertained before the facial nerve had been laid free.

Gustave Bondy showed a man, aged twenty-six, in whom the sinus had been opened during an operation for mastoiditis, and in whom, five days afterwards, *fever and rigors* had occurred. When the dressings were changed, since the wall of the sinus was discoloured, the jugular vein was ligatured immediately, and the sinus then freely exposed. This was found to contain blood; the sinus was then slit up and swabbed, as recommended by Whiting. A small thrombus was found adherent to the inner wall corresponding to the discoloured area on the outside.

The fever lasted some days and was accompanied by pulmonary symptoms (fœtid sputum, moist sounds, shallow breathing). After eight days the fever subsided. The case illustrated that mere puncture of the sinus in such circumstances must be valueless, and that only free exposure and opening of the vessel can reveal the presence of a thrombus.

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E. Ruttin.—*The pathological histology of the Eustachian tubes.* Microscopical preparations were shown of purulent conditions of the tubes in a case of tuberculosis. They had been taken from a patient who in the last weeks of phthisis developed a purulent ear discharge.

It usually happened that the middle ear became infected in the later stages of tuberculosis by the passage of infectious matter up the tubes in the act of swallowing, etc., and the patency of the tubes due to the general cachexia was a favourable condition. These preparations showed that also a direct conduction of the pus, both along and in the walls of the tube, is possible. One could see in these specimens a purulent infiltration of the epithelium, subepithelial layer, and also of the muscular and glandular tissue.

Bárány showed a woman with *sinus thrombosis.* After an attack of influenza she had had pains in the left ear, but no discharge. Fourteen days afterwards she had pyæmic symptoms accompanied with swelling and pain in the right shoulder-joint. Examination of the ear revealed the picture of a subsiding acute otitis. The mastoid process was not tender. Having regard to the pyæmic conditions the antrum was opened. The cortex was abnormally thick, and close to the antrum two or three cells filled with pus were found. The sinus reached very far forwards, and was opened at the first cut of the chisel; it was unaffected by the disease. After the antrum was opened the sinus was followed downwards, and a purulent discharge appeared. The jugular vein was tied. The sinus was exposed almost to the bulb, and within 3 cm. of the "knee," and the whole thrombus removed. Since then there had been no metastasis, and the temperature gradually fell.

Alex. R. Tweedie.

PROCEEDINGS OF THE PARISIAN SOCIETY OF LARYNGOLOGY, OTOLOGY, AND RHINOLOGY.

February 12, 1909.

Subhyoid Pharyngotomy for Epithelioma of the Epiglottis.

M. Castex showed a man, aged fifty-four, whose entire epiglottis was invaded by a tumour which encroached on the base of the tongue. No glandular involvement. Very distressing pains

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