In my third case, that of a man of twenty-eight, in whom I diagnosed right frontal sinusitis with retention of pus, grave cerebral symptoms were present, and I found, after opening the sinus, a perforation in its postero-superior wall. I enlarged this on detecting granulations of the dura mater with subdural abscess. These were respectively removed and drained, and at the same time an exploratory cerebral puncture was made with negative result. To afford suitable drainage a passage into the middle meatus was established, and finally, by the employment of Koenig's osteo-periosteo-cutaneous method, a permanent cure was obtained. My personal experience authorizes me to make the following statements :—

1. In frontal sinusitis with retention of pus one must trephine from the front without delay.

2. The external operation wound can heal by first intention if an opening of sufficient size has been made into the middle meatus.

3. If symptoms cause a suspicion of meningo-encephalic complications, one should trephine the posterior wall of the sinus, and undertake suitable intracranial treatment without fear of injuring the brain.

Ernest Waggett (*Trans.*).

AUSTRIAN OTOLOGICAL SOCIETY.

27th October, 1896. ("Monatschrift für Ohrenheilkunde.")

President—Prof. POLITZER. *Secretary*—Dr. POLLAK.

Dr. ALT. *A Case of Complete Deafness from Mumps.*

This was a girl, aged twelve, who was brought to Prof. Gruber's clinic on the 7th July with a statement that she had suffered from mumps for eight days, and had on the first day shown signs of disturbances of hearing, which increased rapidly, along with noises in the head and slight vertigo, until, on the third day, the deafness was absolute.

On examination the membrana tympani of the right side was found to be normal, and that of the left side completely destroyed, as the result of suppuration which had existed two years previously. Neither high nor deep tones were heard opposite either ear. C , both on the mastoid processes and on the skull, was heard only for a very much shortened period. There was complete deafness for loud speech and whistling. As the child did not reside in Vienna the home doctor was recommended to administer iodide of potassium, and to practise twenty injections of pilocarpin. All the instructions were carried out absolutely, and the child was again brought for observation on the 8th August, when the hearing distance on the left side for conversation extended to thirty centimètres, and on the right only to the immediate neighbourhood of the ear. At the present time the hearing distance on the left side is one mètre, and on the right thirty centimètres.

Dr. Alt referred to the cases already published of deafness from mumps, and also to the theories with regard to it given by Roosa,

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Virchow, and Colin. In the case before them he supposed, following Moos, that there was a serous exudation into the cochlea or the auditory nerve, in view of the absence of any severe disturbances of co-ordination. He would offer no definite opinion as to whether the disease would have subsided without treatment, or whether the improvement was due to the remedies employed—iodine, pilocarpin, and acoustic exercises.

Prof. URBANTSCHITSCH had not seen a case of bilateral deafness from mumps, but, on the other hand, four unilateral ones. In one of these cases he had made use, with advantage, of the continuous current, after twenty applications of which the hearing power was restored. He had found no good result from pilocarpin. He had also seen unilateral auditory anæsthesia follow disease of the sub-maxillary gland, and in one case complete deafness came on after four days, while in another the deafness lasted for a year and a half, and then spontaneously subsided. Prof. Urbantschitsch had never seen recovery take place in cases of bilateral affection, but he had, in unilateral cases, several times seen it, without any treatment. Ordinarily, he made use of absorbent remedies, and especially iodide of potassium. He had seen no good results from pilocarpin. It was hardly possible that acoustic exercises could produce improvement in a case of total deafness, when they had only been used for fourteen days. He was of the opinion that the deafness in mumps was the result of exudation into the sound-perceiving structures of the organ of hearing. The possibility of recovery depended upon whether the exudation, and the disturbances produced by it, were of a severe or of a slight nature. Prof. Urbantschitsch mentioned that he had found good results follow acoustic exercises in cases of syphilitic deafness.

Dr. VON FRANKEL had observed bilateral facial paralysis and polyneuritis in a case of mumps.

Prof. POLITZER, in opposition to Colin, was of the opinion that epidemic parotitis was an infectious disease localizing itself in the parotid gland, and in which the labyrinthine affection, accompanied with the deafness, was a metastatic exudation similar to that in the epididymus and the mamma.

Dr. GOMPERTZ. *An Unusual Appearance in a Case of Mastoid Operation.*

The patient was a boy aged seven, with post-scarlatinal inflammation of the left ear of three and a half years' duration. The discharge was profuse and fœtid, and was accompanied by a bulging of the upper wall of the meatus in its deeper part, which was of the size of a pea, more or less globular, and leaving only a very fine orifice between it and the inferior wall. Slitting up of this intumescence and curetting were only followed by a transitory improvement; therefore Dr. Gompertz carried out Zaufal's radical operation in the middle of March. The antrum was full of cheesy pus, there was a cavity of the size of a cherry in the mastoid process, filled with granulation tissue, and the two first auditory ossicles were absent. Koerner's flaps were made, and it was found that there was an almost complete atresia of the auditory meatus close to the tympanic membrane, so that it was somewhat difficult to make the flaps. The

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after progress was simple, and in the beginning of May the suppuration had ceased, but there was still seen, at intervals of a week or two, a little non-fœtid pus. The transplanted flaps had attached themselves extremely well, and there remained an oval, sharp-edged opening in place of almost the whole of the membrana tympani, only a sickle-shaped strip at the upper and back part having regrown. The condition remained thus till the month of August. At the end of September the patient returned, complaining of headache and frequent vomiting. The suppuration was very slight, but along the whole extent of the artificially produced defect in the osseous meatus, and even in the cartilaginous section, there projected a greyish blue, elastic, semi-cylindrical outgrowth.

At the present moment this swelling has so increased that, beginning at the tympanic margin and continuing to the concha, it narrows the meatus to a very considerable degree. Dr. Gompertz was of the opinion that it was an upheaval of the Koerner flaps by cholesteatoma formation, but he proposed to make in the first instance an exploratory puncture, as there was a possibility that it might be a protrusion of the dura mater, through a defect in the roof of the antrum. He was anxious to show the case before he carried out any operative measures.

Dr. URBANTSCHITSCH remarked that there was in all probability an epithelial membrane, with cholesteatoma behind it; he had seen two such cases, and had rapidly cured them by slitting up the swelling.

Dr. KAUFMANN had seen a similar case at Halle, where it was looked upon as an epithelial cyst.

Prof. POLITZER thought that there was a new connective tissue membrane, by means of which the attic was separated from the atrium of the tympanic cavity, and that the attic thus shut off was distended with viscid mucus.

Prof. POLITZER. *Operative Opening of the Cavities of the Middle Ear; Removal of Sequestra, consisting of the Tympanic Frame and the Labyrinth.*

The patient was a Galician woman, aged thirty, who since her childhood had suffered from otorrhœa. For the last three months there had been painful exacerbations of the suppuration, with speedy development of total paralysis of the right side of the face. Before she was admitted into the wards some polypoid outgrowths were removed from the meatus. On examination there was found profuse otorrhœa with granulations filling a large part of the osseous meatus. The meatus was narrowed in its entire length. The mastoid process presented a normal appearance, and was not tender to pressure. The tuning-fork tests gave no information, as the patient's statements with regard to the localization of hearing during Weber and Rinné's experiments were contradictory. The duration of the perception of tuning-fork vibrations of various pitch were shortened. She was in the sixth month of pregnancy.

In consideration of the local appearance and the facial paralysis it was determined to practise operative opening of the tympanic cavity. The mastoid was chiselled open layer by layer, and the antrum was cleared of the granulations with which it was filled. The postero-

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superior wall of the osseous meatus and the outer wall of the attic were removed, so that the tympanic cavity was laid open, and the scraping out of the luxuriant crop of granulations was proceeded with. The sharp spoon struck upon several sequestra embedded in the mass of granulations, and these were removed one after another. One turned out to be the modiolus of the osseous cochlea, in which the osseous lamina spiralis was clearly distinguishable. It was 3·5 millimètres in breadth, 1·5 in height, and about 3 in length. A piece which appeared to have been originally attached to this was also removed, and measured 1·5 millimètres in breadth and thickness. A second sequestrum consisted of the anterior segment of the capsule of the cochlea. The largest sequestrum, which was only removed with difficulty, was an elongated rough piece of bone, in which there could be recognized distinctly a piece of the horizontal semicircular canal, and the adjacent portion of the osseous border of the vestibule.

After the removal of these masses of granulation and sequestra there still seemed to be a considerable amount of pus in the antero-inferior portions of the middle ear.

After syringing and dressing the patient went through a normal and afebrile course. Four weeks later the secretion in the deeper parts was reduced to a minimum, but the total deafness and facial paralysis remained unchanged.

Dr. KAUFMANN. *Demonstration of a Patient with complete Bilateral Deafness supervening Three Days after a Fall on the Back of the Head.*

The patient was a boy aged thirteen, who was previously perfectly healthy, with good hearing, and at no time any disease of the ear. On the 26th of September he fell from a gymnastic apparatus on to the back of his head, striking the right side on the floor; he did not lose consciousness, but felt at once severe pain in the head, with vertigo; half an hour afterwards he went along with a companion to his dwelling, a walk of about five minutes, and then he vomited. In the night he had repeated attacks of vomiting, headache, and vertigo. During the next two days he felt somewhat better, but on the 29th, in the afternoon, there suddenly supervened bilateral deafness. On the 1st October he presented himself at Prof. Politzer's out-patient department, where the following condition was found. The patient was well developed for his age, the skull rachitic. On the right parietal bone there was a painless fluctuating swelling covered with normal soft parts, extending forward as far as the coronal suture, in the middle line as far as the sagittal one, outwards towards the parietal tuberosity, and backwards to the lambdoidal suture. It was from two to three centimètres in thickness. The denticulations of the lambdoidal suture could be easily felt through it, and above this a triangular portion of the lower end of the parietal bone (about two centimètres in length and one in breadth at its base) was driven in to the depth of about half a centimètre; the skin over the right mastoid process presented a greenish discoloration; there were no abnormal signs in connection with the nervous system; the internal organs were normal, as also the fundus oculi and visual acuity (there

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was slight horizontal nystagmus after some time); the auricle and meatus were normal, and the membrana tympani retracted, and there were no signs of injury; deafness was absolute, even for whistles and trumpets, no tuning-forks being heard; there was distinct unsteadiness on turning round with the eyes closed. Exploratory puncture of the fluctuating swelling by means of the hypodermic syringe evacuated thin, bright red, hæmorrhagic fluid.

The further course of the symptoms was that in a few days the vertigo completely disappeared, and the fluctuating swelling underwent spontaneous absorption; the fractured part of the skull was no longer delimitable by the 8th October. In the left ear the hearing improved to a very slight degree (vowel-hearing), but in the right one he could, as early as the 2nd October, distinctly comprehend vowels and single words at a distance of half a mètre, while on the 4th the sounds of the whistle and trumpet could be heard across the whole length of the room. At present, the hearing of the right ear for single words extends to two-thirds of a mètre, and the tuning-fork at any part of the skull is lateralized to the right. The duration of perception for high and deep tones is very considerably lowered. The treatment consisted of iodide of sodium, internally, pilocarpin injections, and injections of strichnine. The case appeared to be one of fracture of the right parietal bone with hæmatocele (meningocele spuria), and complete bilateral deafness with vertigo.

Dr. Kaufmann discussed exhaustively the question of the site of the disease, and thought he could exclude any central affection (temporal lobe, acoustic paths, internal capsule, corpora geniculata, and quadrigemina), as also a bilateral affection of the medulla oblongata, or a fracture of the base of the skull, with injury to both temporal bones. According to his opinion, the affection was situated in both labyrinths, and it was either a traumatic lesion of the labyrinths—possibly the so-called commotio labyrinthica, or a labyrinthine affection resulting from concussion of the brain. He referred to the experiments which had been made with regard to concussion of the brain (Ferrari, Duret, Gussenbauer), from which it was known that, by compression of the elastic skull, a sudden increase of pressure could be brought about which affected the whole contents of the endo-cranium, and was sufficient to set up wave movements in the cerebro-spinal fluid. These waves were propagated in all directions, and they made themselves more particularly felt in those regions where the largest collections of the fluid were present (*e.g.*, at the base of the brain). This sudden increase of pressure must extend to the peri-lymphatic spaces in view of their well-proved communication with the sub-arachnoid space. This disturbance would be communicated to the endo-lymph, and in this way small hæmorrhages would be likely to take place in the endo-lymphatic walls, just as Duret had proved to take place in the walls of the larger blood channels in commotio cerebri (capillary rupture and other lesions at spots considerably removed from the original injury). For the explanation of the occurrence of the deafness at an interval of three days after the injury, he referred to the views of Bollinger, Schwan, and Michel on the so-called late traumatic apoplexy (traumatic degeneration, necrotic softening, secondary hæmorrhage).

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He cited several analogous cases published by Urbantschitsch, Politzer, Schwartze, and others; anatomical investigations by Habermann, and experiments made by Ostmann; and expressed his belief that further physiological and experimental investigations would afford an explanation of these cases.

Prof. GRUBER was of the opinion that a fissure of the base of the brain could not be excluded, even although the membrana tympani was intact. Hæmorrhage into the labyrinth could also occur a few days after the original injury. At the same time it was an argument against the existence of these injuries that the patient was beginning to hear again.

Prof. POLITZER agreed with Prof. Gruber's view, but still it was quite reasonable to suppose that concussion of the cranial bones might bring about hæmorrhage into the labyrinth.

Dr. KAUFMANN thought that even if it were known from the literature of cases that fracture of the base of the skull could run its course without severe symptoms, still, in the present case, the absence of all characteristic symptoms, the direction of the blow, the late occurrence of the deafness, and the diminution of the symptoms seemed to point to the absence of such injury.

Prof. GRUBER called attention, on the other hand, to a case of fracture of the base of the skull shown in the Medical Society by Prof. Weinlechner, in which the symptoms appeared so slight that the patient was sent out of the hospital and died next day. He thought the prognosis in this case was not a favourable one.

Dr. POLLAK. *Prevention of Infection by Eustachian Catheters.*

Referring to the difficulty of disinfecting catheters in large out-patient departments, he had got Reiner in Vienna to make him a suitable receptacle in which the catheters were pushed through a perforated plate of caoutchouc with numbers, so that they could be kept for individual patients and preserved in antiseptic fluids.

Dr. KAUFMANN'S *Demonstration of Specimens:*

I. *Chronic Median Suppurative Otitis. Pyæmic Symptoms. Radical Operation, Opening of an Extra-Dural Abscess. Fifteen days later, Symptoms of Cerebral Compression. Operation on an Abscess of the Right Temporal Lobe. Thrombo-phlebitis. Meningitis.*

The specimen was from a man aged nineteen, who in his childhood had gone through measles and pneumonia. For several years he had had dulness of hearing and discharge from both ears. In the middle of last August he was attacked with severe rigors, followed by intense frontal headache and severe pain in and behind the right ear. At the same time giddiness and vomiting came on. On the way to the hospital at Vienna he was again attacked with rigors and severe headache. At the end of August he came to Prof. Politzer's out-patient department, where there was made out chronic median suppurative otitis, with destruction of the membranæ tympanorum, swelling and granulation in the mucous membrane of the tympanum, fœtid suppuration and lowering of hearing power for loud speech both sides to one to two mètres.

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There were no signs in connection with the mastoid process. The patient was taken into the in-patient department. Temperature was 39·8. There were no rigors. The fundus oculi was normal. No sign of disease of the internal organs was present. The intelligence was clear, but there was severe headache and vertigo, with slight tenderness on pressure below the tip of the right mastoid process.

On the 3rd September the radical operation, with exposure of the sinus, was undertaken. The sinus was found at a slight depth, about three-quarters of a centimètre, behind the meatus. Close round it there was seen thick, inoffensive pus, which under pressure welled out to the amount of something more than a teaspoonful. A probe passed through a large opening in the roof of the mastoid about one centimètre in diameter, into a subdural abscess, apparently of about the size of a nut with smooth walls.

The dura was not visible through the wound. The sinus was exposed in its whole extent through the mastoid process, the wall being normal everywhere except in a small part of its uppermost segment, where it had a dirty greyish-green tint. The sinus canal was not opened. The radical operation was then proceeded with, and the attic and middle ear were found filled with dirty greyish-white macerated epidermic (cholesteatoma) masses, behind which there were seen granulations growing from the osseous walls.

The ossicles were absent. The membranous meatus was then slit up, and an iodoform dressing applied. For the next few days the patient was free from fever, and complained only of severe headache. At the first change of dressing on the fifth day the wound was seen to be normal, and devoid of any considerable amount of secretion. On the 14th the patient vomited repeatedly, and on the 18th September there was suddenly a rise of temperature to 38·2, with clouding of the intelligence. The pulse became slower (54), and there was slight ptosis, with diminished reaction of the pupils, no abnormality in the fundus oculi, and no retraction of the neck. The patellar reflex was lost.

The patient was now removed into Prof. Albert's wards for further operation (? extra-dural cerebral abscess). Under a moderate degree of ether narcosis the operation was proceeded with by Dr. Ewald. The existing incision was prolonged upwards, in a crescentic form, for three or four centimètres above the attachment of the auricle, where the bones were chiselled through, at the upper part, and reflected downwards, while the dura mater of the right temporal lobe, on its lateral and basal aspects, was exposed. There was distinct pulsation, and a small spot on the lateral aspect looked suspicious, on account of a bluish discoloration. The dura mater was further incised, and the cerebral substance protruded. The scalpel was pushed into the temporal lobe about three centimètre deep, in a forward direction. On the point of the knife there was found a little thick pus, which, however, in spite of an enlargement of the incision, did not evacuate itself. A thick canula was introduced into the canal of the puncture, and a syringe of about five centimètres capacity was attached to it. At the depth of about three centimètres, discoloured, greenish, thick, and extremely offensive pus was withdrawn by aspiration.

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The canal was then held open by means of fine forceps, and about ten cubic centimètres of pus escaped. Iodoform gauze was introduced in the abscess cavity, and the wound was stitched up. A dressing was applied. Immediately after the operation the pulse rose to seventy, the intelligence became clearer, and in the afternoon the patient could answer when called, and asked for water, but was extremely restless. On the 19th September his temperature was 39·6, his restlessness very considerable. The dressings were changed, and a portion of the cerebrum prolapsed, of about the size of a hen's egg. In the afternoon the dressing had to be changed again, as the patient was very restless, and tore off his dressings. On the removal of the dressing there were found lying in it two pieces of brain substance about the size of a hen's egg. Temperature 39·8. Next day he was quite unconscious, had right ptosis, restlessness, trismus, inequality of the pupils (left the larger), inactivity to light, tensor reflex lost, pulse 160, temperature 40°. Death at ten o'clock at night. *Post-mortem* diagnosis: Abscessus cerebri ichorosus lobi temporalis dextri cum perforatione in ventricul. lateral. dextr. e thrombo-phlebitide purulenta ichorosa sinus sigmoid. dextr. subsequente meningit. purulent. diffusa.

II. *Malformation of both Ears.*

In this case there was absence of the meatus and of the membrane, and malformation of the ossicles. The case will be published in full later on.

Dr. GUSTAV BRUHL. *A Method of Injecting the Petrous Bone with Metallic Mercury.*

The temporal bones of new-born children, adults, and animals are decalcified and dehydrated in a two to ten per cent. solution of hydrochloric acid. The openings are then stopped up with sponge, and mercury is injected through the fenestra ovalis by means of a hypodermic syringe; the Fallopian canal can also be filled in the same way. In order to make the bones transparent, Dr. Brühl carries out the method recommended by Katz ("Archiv für Ohrenheilk.," Oct., 1884), somewhat modified inasmuch as he suspends the preparation in xylol. By means of these injections he found that the cubic capacity of the inner ear was in the new-born child about one hundred and twenty cubic millimètres, and in adults two hundred and ten. Photographs of these, as well as of non-decalcified preparations by means of the Röntgen rays, gave good pictures of the osseous labyrinth. He demonstrated a number of such pictures and specimens from infants at birth, adults, monkeys, and dogs, in which all the details of the osseous labyrinth could be distinctly recognized. *Dundas Grant* (*Trans. and Abst.*).

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