the squamous bone (Fig. 1), (the first along the first cut of the first section, the second along the first cut of the second section, and the third along the second cut of the third section), and firmly maintain the temporal bone in its complete normal configuration, when the hinges are closed; when they are opened, the bone opens into its several parts, like the pages of a book (Fig. 3). This plan of union prevents loss and confusion with regard to the pieces of different temporal bones, and in no way damages or interferes with the clearness of the preparation. With regard to the subdivisions, which are always small and sometimes very delicate, I have succeeded in uniting them to the main piece to which they belong by means of small gummed ribbons. (*Vide* Fig. 3, piece No. 2.) These act like so many small hinges, and permit examination of the most minute and complicated parts. This system also offers the advantage of being easily removable, if necessary, without in any way injuring the small and delicate parts of the preparation. In this way I have been able to replace in position piece No. 2, after it has been subdivided into five fragments for the minute demonstration of the labyrinth. *StClair Thomson* (*Trans.*).

SOCIETIES' MEETINGS.

AUSTRIAN OTOLOGICAL SOCIETY.

First Special Annual Meeting (*OTOLOGENTAG*), *June 28th and 29th*, 1896.

("Monatschrift für Ohrenheilkunde," July, 1896. Reported by Dr. JOSEPH POLLAK.)

(*Continued from page 206.*)

President—Prof. GRUBER.

Dr. R. SPIRA (Cracow). ***A Case of Central Osteitis of the Mastoid Process running a Latent Course, and presenting the Symptoms of Trigeminal Neuralgia.***

This was a man seventy-three years of age, otherwise healthy and strong, and who for some time had suffered from chronic catarrh of the middle ear, subsequent to acute tympanitis following influenza. At the same time there came on severe pains in the neck, larynx, and corresponding half of the head. There was an accumulation of exudation in the tympanum, which was evacuated, after which the otitis ran through its usual course. The drum cicatrized in three weeks. There were no pains in the ear or mastoid process, but over the half of the head, occasionally propagated to the other side without obvious cause. A diagnosis of trigeminal neuralgia was made, and iodide of potassium and galvanism were ordered. Soon after the second sitting there occurred paralysis of the abducent nerve of the same side, with its typical consequences, diplopia and vertigo.

The patient suffered also from sleeplessness, loss of appetite, emaciation, and weakness, but no fever nor cerebral disturbance. Nothing was

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observed in the ear or mastoid process. However, a few months later there occurred from time to time transient evidences of irritation in the mastoid region, accompanied each time with a diminution of the headache, the latter returning as the inflammatory symptoms subsided. After about eight months a sub-periosteal abscess on the mastoid process was opened: the cortex was found carious and perforated by a fistula. The fistula was enlarged, and in the deeper part of the bone there were found caries and pus. The bone was scraped out, plugged, and dressed antiseptically. After six weeks he was perfectly well, the headache completely disappeared, and the paralysis of the sixth nerve rapidly diminished.

The difficulty in this case was to decide upon the causal nexus between the neuralgic pains and the mastoiditis, also the relation of the abducent paralysis to the mastoid disease.

The question arises as to whether there was not, perhaps, an extra-dural abscess in the posterior fossa which was evacuated when the bone was laid open. The course of the disease and the result of the operation would give some support to such an opinion, and otherwise the occurrence and course of the paralysis of the sixth nerve would be more difficult to explain. Lastly, Dr. Spira asked whether those present could explain the combination of symptoms in the light of the anatomical changes which had been found.

Prof. URBANTSCHITSCH thought the abducent paralysis could be explained by the presence of the middle ear disease without the assumption of there being a sub-dural abscess.

He had in an exhaustive treatise drawn attention to the frequent occurrence of motor disturbances of the eye in cases of disease confined to the middle ear.

Dr. FRANCK-HOCHWART drew attention to the *post-mortem* examinations made by Darkschewitsch and Tarchanow, which explained paralysis of the whole facial nerve and of the abducent nerve on another basis. They found in such a case a neuritis of the nerves referred to without there being any other source of compression detectable, and they looked upon the neuritis as being of infectious origin and dependent upon a cario-necrotic process in the temporal bone.

Prof. URBANTSCHITSCH, in opposition to Dr. Franck-Hochwart, said that such motor disturbances could be brought about from some particular point in the meatus or middle ear, but that they could be of reflex nature.

Prof. POLITZER doubted very much the possibility of a reflex paralysis existing in this case, because if such were possible it would be observed more often in view of the great frequency of suppurative disease of the middle ear; while, on the contrary, it was one of the rarest events possible.

Prof. URBANTSCHITSCH said that, on the contrary, in a case of sudden paralysis of the abducent muscle occurring during the operation of extraction of polypus, paralysis remained permanent. The circumstance that pain occurred during catheterization made it probable that mucus was driven through the tube into the tympanum.

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Dr. SPIRA remarked that what had led him to think of extra-dural abscess was the statement of Prof. Politzer that, according to his observation, frequent alternations and intermittences and recurrences of dangerous symptoms were the most important diagnostic indications of extra-dural abscess.

Prof. GRUBER was of opinion that this case was to be looked upon as one of disease of the mastoid process, such as is observed after influenza. He had drawn attention during the first influenza epidemic to the fact that the aurist had frequently to deal with the consequences of influenza in the mastoid, even when the influenza itself had long run through its course, because the microbes find in the mastoid cells a very favourable nidus for multiplying undisturbed and bringing about their usual injurious effects. He considered this point illustrated by the case under their notice.

Prof. POLITZER. *Ménière's Complex of Symptoms in a Case of Traumatic Lesion of the Labyrinth. Demonstration of the Histological Appearances.*

In the introduction to his address Prof. Politzer dwelt upon the importance of the anatomical examination in traumatic lesions of the labyrinth, with a view to the explanation of the accompanying disturbances of function, especially of Ménière's complex of symptoms which come on in consequence of these. In literature there is already a long series of cases of deafness resulting from concussion or fracture of the skull, but only two have undergone full anatomical investigation, one by Voltolini and the other by himself. In both the fissure at the base of the skull went right through both pyramids as far as the inner wall of the tympanum, and without visible lesion of the tympanic cavity. The bleeding occurring in the labyrinth brought about deafness and Ménière's symptoms. Histological examination of traumatic affections of the labyrinth are up to the present unknown.

He was now in a position to demonstrate the histological appearance in a case observed thoroughly during life. The subject was a shoemaker aged twenty-one, on whose head, on the 28th December, 1895, a bushel of mortar fell, rendering him unconscious. He was taken into Prof. Dittel's surgical wards, where consciousness returned after three days, but he remained totally deaf, and his gait was unsteady and reeling. On the 17th January he was transferred to Prof. Krafft Ebing, who found right-sided paralysis of the facial nerve, paralysis of the right half of the soft palate, loss of sense of taste in the right half of the tongue, a reeling gait, with a tendency to fall to the left side, and some defect of intelligence. The organs of hearing were examined on the 24th January, and on both sides there was found retraction of the somewhat opaque membranes, and complete deafness for every kind of noise or tone. On the 31st there suddenly occurred severe feverish symptoms, with diffuse pain in the head, vomiting, and dulness of the sensorium. The cerebral symptoms increased during the following days, and there developed at the same time a purulent middle-ear suppuration in the right ear, with bulging of the tympanum. Paracentesis gave vent to a

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quantity of pus, but the cerebral symptoms were not thereby affected, and three days later death took place, apparently from diffuse meningitis. The details of the course of the disease up to the fatal ending have been communicated by Dr. Joseph Hirschl.

On *post-mortem* examination there was found purulent meningitis and a fissure at the base of the skull which went through both petrous bones, but only extended as far as the inner wall of the tympanum. There was empyema of the sphenoidal and of both maxillary sinuses, purulent exudation in the right tympanic cavity. The fissure passing through the petrous bone went on both sides two millimètres behind the internal auditory meatus, as far as the upper edge of the petrous, and it could be followed from here on the upper surface of this bone as far as the tegmen tympani. On the right side it passed through the greatest diameter of the cochlea, and on the left side through the lowest cochlea whorl. There was blood-stained exudation in both cochleæ. The microscopical examination of the decalcified labyrinth showed, on the right side, both scalæ of the cochleæ were, in all their turns, filled with an exudation, partly of fine granular nature, partly consisting of round cells ; in various parts of the endosteum there was a growth of nucleated connective tissue. The details of Cortis' organ could not be distinguished. The nerve fibres of the modiolus, the spiral membrane, and the spiral ganglion were invaded by fine granular substances and nuclear cells. Similar places of exudation to those in the cochlea were found in the utricle, in the ampulla, and in the semicircular canals. On the outer side of the membranous ampullæ and semicircular canals there shot up nucleated, neoplastic, connective tissue.

In the left labyrinth there was much less free exudation than in the right. On the other hand the scala tympani of the first turn of the cochlea showed a fine, reticulated, new connective tissue, which contained numerous spindle-celled nuclei, and along with them, here and there, wandering cells ; processes from the new connective tissue to the endosteum were found also in the second turn of the cochlea and in the cupula. Cortis' organ was rendered unrecognizable by the enormous proliferation of epithelial tissue. The bundles of nerves of the ramus cochleæ showed the same changes as on the right side. In the vestibule there were here and there thickenings of the endosteum, as also in the ampulla and the semicircular canals. The membranous structures of the vestibule and semicircular canals showed very little change.

In considering this case Prof. Politzer thought that the total deafness, as well as the occurrence of Ménière's symptoms, were quite explained by the anatomical appearances. The empyema of the sphenoidal and maxillary sinuses, as well as the purulent inflammation in the right ear, were, without doubt, the results of the suppurative inflammation of the pharyngeal tissues, produced by the fracture of the base of the skull. Nothing definite can be said with regard to the occurrence of the meningitis. Whether it was the result of the empyema of the sphenoidal sinus or of the purulent middle-ear inflammation, or of lesion of the meninges not detectable by the naked eye, could not be made out. A point of especial interest in the histological examination is the evidence of an intense

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inflammatory formation of new connective tissue five weeks after the injury which gave rise to it. Prof. Politzer elucidated the description by means of a number of large charcoal drawings and the demonstration of the histological preparations.

Prof. GRUBER. *On Otitic Intracranial Affections.*

Prof. Gruber referred to the insufficiency of subjective as also of objective morbid signs and symptoms in connection with the topical diagnosis of intracranial process. On this account there had recently been made very complete studies of the statistics, and also endeavours to place these at the service of practical otology.

Valuable works had been published within recent years by Körner, Forselles-Robin, and more particularly quite recently by Hessler. Prof. Gruber had endeavoured to turn to advantage in this direction the large amount of material afforded by the General Hospital at Vienna. He was indebted to Prof. Weichselbaun for having placed the records of the *post-mortem* examinations at his disposal; also to Drs. Alt and Steiner for their assistance in analyzing the records of the sections dating from the 1st January, 1873, to the 1st December, 1894, and numbering 40,073. The year 1873 was selected because it was first in this year that the otological clinics were established, so that the changes in the organs of hearing were studied more carefully than was previously the case.

The following were the chief questions which he desired to solve, and the answers afforded by the results of these examinations.

Question 1. What is the proportion of the number of deaths from intracranial inflammatory affections to the total of 40,073? It was found that 1806—1242 men, 564 women—that is to say, 4·5 per cent., died from one or more intracranial inflammatory affections.

Question 2. What is the relation of the number of the inflammatory intracranial diseases obviously of otitic origin, compared with that of the simple diseases of this character not arising from any such cause? In reply it was found that the otitic origin was present in 232 cases—163 men, 69 women—that is to say, that out of the total of 1806 cases of intracranial affection, they amounted to 12·8 per cent., and in relation to the grand total of *post-mortem* examinations—40,073—0.58 per cent. Out of these 232 cases, 81 cases were followed to the autopsy by otologists, the remaining ones came from the surgical and medical departments; therefore, 34·91 per cent. of them by otologists, 65·09 per cent. by resident medical officers and surgeons. In regard to this question, Prof. Gruber remarked that he was quite convinced that, in a considerable number of cases of inflammatory intracranial disease, the connection with otitis was overlooked, and either did not come to section, or the relation to otitis was missed because there was no idea of its presence. This must also be the case in other institutions. If, therefore, the statistics in this direction are not quite exact, they are at least of the same value as those brought forward by other authors.

Question 3. What is the relation of these secondary otitic intracranial inflammations which were dissected to the age of the patients? It must here be mentioned that in the general hospital at Vienna

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children under six years are only very exceptionally admitted. They are treated in the children's hospitals. In the great number of *post-mortems*, therefore, there is found only one of a child of three months old, and one of a child of one month. The age of the others is shown in the following table :—

	Males.	Females.
From 5 to 10 years	0	2
10 „ 20 „	53	14
20 „ 30 „	46	26
30 „ 40 „	30	12
40 „ 50 „	22	4
50 „ 60 „	13	4
60 „ 70 „	3	1

From this it will be seen, as was already pointed out by the author in January, 1862, that purulent middle ear inflammation is most dangerous in individuals between the ages of puberty and of fifty, and that in the earlier and later ages life is less threatened.

Question 4. On which side was the ear disease in the 232 cases which came to *post-mortem* examination?

Answer—

Right ear	118	= 50·87 per cent.
Left ear.....	103	= 44·39 „
Both ears	6	= 2·59 „
Not stated	5	= 2·15 „

Question 5. Of what nature was the ear disease in the 232 bodies? In answering this question Prof. Gruber ranges the cases into two categories. First : Those in which only the soft parts of the middle ear were affected. Secondly : Those in which caries or necrotic disease of the temporal bone was present.

Intracranial secondary inflammatory affections were found in simple suppurative otitis media without caries 65 times (44 males, 21 females), equal to 28 per cent.; whereas, in those complicated with caries, 167 times (128 males, 39 females), equal to 72 per cent. It will be seen from these enumerations that in the simple as well as in the carious cases, the frequency was greater in men than in women, but simply for the reason that the primary affection was more frequent in the male than in the female sex.

Question 6. Involvement of the vessels. In the first place it appeared to Prof. Gruber of importance to take notice of the disease of the blood vessels of the dura mater, as it was well known that these frequently acted as the intermediary between the primary disease in the organ of hearing and the inflammation of the brain and its membranes. It was, therefore, incumbent to note how often sinus affections occurred altogether in the 232 cases, which sinus was affected, both in simple middle ear inflammation and in cases complicated with caries. Finally, what kind of thrombus was found in the different cases. The following tables show these points :—

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SUPPURATIVE MEDIAN OTITIS, SIMPLE (WITHOUT CARIES).

Nature of the Sinuses Affected.	Solid Thrombus.						Total.	Suppurating Thrombus.						Total.
	Males.			Females.				Males.			Females.			
	R.	L.	B.	R.	L.	B.		R.	L.	B.	R.	L.	B.	
Sigmoid Sinus	3	2	..	1	2	..	8	2	2	..	1	2	..	7
Transverse Sinus alone or with the Sigmoid	3	..	..	2	..	..	5	3	..	..	1	..	..	4
Cavernous Sinus and its Appendages	3	1	..	..	..	..	4	1	1	..	..	1	1	4
Superior Petrosal and Sigmoid Sinuses	..	..	..	..	1	..	1	..	..	..	..	1	..	1
Superior Petrosal and Transverse Sinus	..	..	..	1	..	..	1	..	..	..	1	..	..	1
Sinus of Jugular Vein and Transverse Sinus	1	..	..	..	..	..	1	..	..	..	..	..	..	..
Sigmoid, Transverse, and both Cavernous Sinuses	1	..	..	..	..	..	1	..	..	..	..	..	..	..
Sigmoid Sinus and Jugular Vein	1	..	..	..	..	..	1	..	..	..	..	..	..	..
Cavernous Sinus	..	..	1	..	..	..	1	..	..	..	..	..	1	1
Transverse and Cavernous Sinuses and Jugular Vein	1	..	..	..	..	..	1	1	..	..	..	..	..	1

SUPPURATIVE MEDIAN OTITIS (WITH CARIES).

Nature of the Sinuses Affected.	Solid Thrombus.						Total.	Suppurating Thrombus.						Total.
	Males.			Females.				Males.			Females.			
	R.	L.	B.	R.	L.	B.		R.	L.	B.	R.	L.	B.	
Sigmoid Sinus	5	11	1	..	2	..	19	3	8	..	..	1	..	12
Transverse Sinus alone or with the Sigmoid	5	13	..	5	2	..	25	4	8	..	3	2	..	17
Sigmoid and Longitudinal Sinuses	..	1	..	..	1	..	2	..	1	..	..	..	..	1
Sigmoid Sinus and Jugular Vein	4	3	..	1	1	..	9	2	3	..	..	1	..	6
Bulb of Jugular Vein	..	1	..	1	1	..	3	..	1	..	..	1	..	2
Sigmoid and Transverse Sinuses and Jugular Vein	1	1	..	1	..	..	3	1	1	..	..	..	..	2
Cavernous Sinus	..	..	..	..	..	1	1	..	..	..	..	..	1	1
Sigmoid and Reil's Sinuses	1	..	..	..	..	..	1	1	..	..	..	..	..	1
Cavernous and Petrosal Sinuses	..	..	1	..	..	..	1	..	..	..	..	.	..	..

The total of cases without caries, which were dissected, and in which sinus thrombosis was found, amounted to 42 (24 with solid, 18 with broken-down suppurating clot). The total of those with caries, showing sinus thrombosis, amounted to 106 (64 with solid, 42 with a purulent breaking-down clot). The sinuses most frequently affected were the sigmoid and transverse [lateral, D. G.], and this occurred 24 times in the 42 cases without caries, and 73 times in the 106 with caries; according to sex, 73 males and 24 females.

Question 7. What consecutive affections were found in the brain and its membranes in the 232 cadavers? The writer here again distinguishes cases according to whether caries was present or not.

In simple otitic processes, without thrombus in the sinus, there was found :—

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Meningitis .....31 = 13 per cent. (21 men, 10 women).
Cerebral abscess ...19 = 8·2 „ (14 men, 5 women).
Cerebellar abscess... 1 = 0·4 „ (1 woman).

In simple otitic disease, in which there was a thrombus in one of the sinuses :—

Meningitis .....12 = 5·5 per cent. (7 men, 5 women).
Cerebellar abscess... 2 = 0·8 „ (2 men).

In those cases in which there was caries of the temporal bone, but no sinus thrombosis :—

Meningitis.....40 = 17 per cent. (34 men, 6 women).
Cerebral abscess ...13 = 5·6 „ (12 men, 1 woman).
Cerebellar abscess .12 = 5·5 „ (8 men, 4 women).

In those with caries and thrombosis :—

Meningitis .....21 = 9 per cent. (17 men, 4 women).
Cerebral abscess ... 7 = 3 „ (6 men, 1 woman).
Cerebellar abscess . 4 = 1·6 „ (2 men, 2 women).
Meningitis with cholesteatoma 8 = 3·2 per cent. (6 men, 2 women).

Three died of pyæmia out of those without caries, but with otitic sinus thrombosis, 16 (11 males, 5 females), equal to 6·8 per cent. ; and of those with caries and thrombosis, 32 (22 males, 10 females), equal to 13 per cent.

The material obtained from the records of the *post-mortems* has been analyzed from various other points of view, regarding which Prof. Gruber proposes to publish further particulars.

Prof. POLITZER. ***Contributions to the Operative Opening of the Cavities of the Middle Ear.***

In the introduction to the paper, Prof. Politzer referred to the important advances which had been made in aural surgery, through the improvements in the methods of laying open the cavities of the middle ear by operation. The value of these will only be known later on, when the indications for their adoption are more precisely defined than at present. Prof. Politzer thinks that at present operations are carried out by many without strict indications, and before endeavours have been made to cure the suppuration by the customary methods of treatment.

The anatomical structure of the temporal bone, and the extension of pneumatic spaces into its furthest parts, favour the establishment of persistent foci of suppuration and of deep burrowing diseases of the osseous structures. To this must be added the manifold mechanical obstructions to the flow of pus from the outer meatus, the frequent development of cholesteatoma, and the destructive character of certain pathogenic micro-organisms—diphtheria, tuberculosis, etc. In spite of all this, spontaneous recovery is not uncommon, as is shown by the formation of fistulæ on the mastoid process, with the ejection of sequestræ, the formation and epidermization of extensive defects of bone in the outer attic and the postero-superior wall of the meatus, with cessation of suppuration. Prof. Politzer showed a skull in which, as the result of chronic middle ear suppuration, the outer wall of the attic and the postero-superior wall of the osseous meatus had been destroyed, and in which a large cavity had been formed, made up of the external meatus, the

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tympanic cavity, and the mastoid antrum, while exit of the secretion was rendered perfectly free. The bone defect in this preparation was almost identical in its anatomical relations with that produced artificially in operative opening of the spaces of the middle ear. The principle of the operation, for the introduction of which into practice we are indebted to Küster, consists in the removal of the postero-superior wall of the osseous meatus and the outer wall of the attic, whereby the removal of carious ossicles, the clearance of granulations, cholesteatomatous masses, and carious areas of bone from the tympanic cavity and the mastoid process are rendered possible, and the conditions favourable for the cessation of suppuration in the temporal bone are established.

After a cursory view of the historical development of these operative procedures, now practised for six years, Prof. Politzer referred to the indications which he looked upon as one of the most important points in connection with the operations in question. These depend upon the objective appearances in connection with the subjective symptoms which indicate the development of complications dangerous to life. The writer discussed, in sequence, the indications for laying open the middle ear, dwelt upon the importance of certain appearances of the drum in the diagnosis of antral suppuration and of cholesteatoma formation in the attic and mastoid, and recommended the more frequent use of the pneumatic speculum for the determination of the seat of the suppuration. The number of cases operated on by Prof. Politzer in his clinic and in his private practice, for the opening of the cavities of the middle ear, amounted to fifty-three. In this number there are not included the acute cases, and those of typical trephining of the mastoid (Schwartze) for chronic suppuration. With this enumeration are a number of cases observed which had been operated upon in his clinic by Drs. Gompertz and Kauffmann, and some elsewhere, in which he had the opportunity of judging of the results of operation. The analysis of cases operated on by Prof. Politzer is as follows :—

In four cases the cavities of the middle ear were laid open in patients in whom, some considerable time before, Prof. Politzer had performed Schwartze's typical operation, and in which recurrences with persistent suppuration had taken place ; and in nine other cases of recurring middle ear suppuration, in which the opening of the mastoid according to the typical method had been carried out by other aural surgeons. In eight cases there was, along with profuse fœtid otorrhœa or granulations or cholesteatoma in the tympanum, pain in the mastoid process without swelling of the outer integuments ; twelve times pain with swelling of the skin and periosteum of that process. In eleven cases there was a sub-periosteal abscess over the mastoid, the walls of which were lined with granulations ; of these, seven had a fistulous opening in the cortex leading into the interior of the mastoid, four with no such fistula.

In eight cases there was an open fistula on the mastoid process with spontaneous dehiscence of the cortex ; in five, a fistulous opening in the posterior wall of the meatus, through which a probe could be introduced either into the antrum or into a cavity in the mastoid process filled with granulations. Extreme narrowing of the meatus from hyperostosis of the

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osseous part and (unyielding) hypertrophy of the lining of the meatus was present in seven cases. In fifteen cases there was, besides the local pain in the ear or mastoid, headache, fever, occasionally sleeplessness, vertigo, and vomiting. With facial paralysis of longer or shorter duration, there were six cases which came under operative treatment, and of these three were affected with tuberculous caries of the mastoid and tympanum, with or without formation of sequestræ.

Prof. POLITZER. *A Description of the Method of Operation, and of the Modifications indicated by the different Pathological Conditions in the Temporal Bone.*

Prof. Politzer gave a sketch of the appearances found by him after laying open the cavities of the middle ear.

In about half the cases there were found masses of cholesteatoma in the tympanic cavity, in the antrum, and in the mastoid process. In fourteen cases there was immediately beneath the cortex an extensive cavity in the mastoid process, with simultaneous cario-necrotic defects in the postero-superior wall of the meatus. The cavity was filled with discoloured granulations, fragments of bone, or greasy, caseous masses. In three cases the postero-superior wall of the osseous meatus was completely lost; in five the mastoid process and the postero-superior wall were densely sclerosed. The transverse sinus was exposed to a varying extent from suppurative disease in four cases. In three cases the dura mater was exposed, once above the mastoid antrum, twice above the tegmen tympani.

In the majority of the cases the antrum and the walls of the tympanum were affected by disease of bone; the malleus and incus generally absent. On account of these conditions Prof. Politzer operated of late years chiefly according to Küster's method. Schwartze's typical opening is advisable where the hearing power is relatively good, as this is apt to be diminished by laying open of the middle ear and removing the ossicles. As regards accidents in the operation, severe hæmorrhage, from granulations or from the vessels in the bone, or from an emissary vein of Santorini, was easily checked by plugging. Once the dura mater was exposed without this producing any unfavourable effect on the reparative process. In one case during the scraping of the attic the horizontal part of the facial nerve was injured by the sharp spoon; the paresis of the facial nerve which ensued disappeared entirely after several months. In two cases in which before the operation there was paralysis of the facial nerve this entirely disappeared after healing took place. In no instance was the horizontal semicircular canal injured. The plastic methods varied according to the anatomical conditions found in the individual cases. Most often the posterior cartilagino-membranous wall of the meatus was split longways, and in order to make as wide an orifice to the meatus as possible, one flap was stitched above and the other below to the external cutis. Several times Körner's flaps were employed with good results, as also Thierch's method of transplantation. In cases of granulations in the middle ear and of cholesteatomata of small size in the antrum, Prof. Politzer allowed the operative wound behind the ear to close; but when there

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were active cholesteatoma cavities in the mastoid process he kept the artificial orifice open, to allow of the more ready inspection of the seat of the disease and of the more thorough cleansing of the cavity.

As regards the result of this operative opening of the cavities of the middle ear, Prof. Politzer is of opinion that the views of many operators with regard to the cessation of the discharge after the operation—50 per cent. to 75 per cent.—are too optimistic, as the length of observation is, on the whole, still too short, and cases have occurred in which recurrence of the discharge took place after two or three years. Cholesteatoma are known to recur almost without exception. The term "radical" operation is therefore not absolutely exact of the cases operated on by him; in seventeen the suppuration had ceased for a considerable time, the remaining cases are still under observation, and the ultimate result cannot yet be determined. A certain number, as usual, have disappeared from observation. Further operations were carried out seven times. In one case the external meatus was quite closed. The duration of treatment was in general shorter than in cases of the typical opening of the mastoid process, but still required, as a rule, several months. Hearing power was generally improved by the operation, but in rare cases made worse. As after the typical mastoid opening, so also after this operation, the troublesome head symptoms were relieved and improvement in general health observed. Fatal results were observed in six cases—three times from pyæmia, which was already present before the operation; twice from chronic tuberculous otitis; and once from a cerebral abscess, without symptoms, which was present before the operation.

Prof. Politzer can only understand the extremely favourable results from this operation reported by other operators on the supposition that, without careful choice, many cases had been operated on in which there existed chronic otorrhœa without any deep-seated changes in the temporal bone, and in which the ordinary methods of treatment had not previously been tried. Such cases must obviously heal in a short time. High as is the value of these operative procedures, and life-saving as he holds the operative exposure of the cavities of the middle ear to be in many cases, he insists that these proceedings should be strictly confined to cases in which strong indications are present.

Prof. URBANTSCHITSCH. *On the Operative Exposure of the Middle Ear.*

The writer had within the last two years, from October, 1894, to the present time, observed 72 cases of the so-called radical operation in the middle ear. Of these 6 occurred in cases between the ages of 6 and 10; 17 between 11 and 15; 18 between 16 and 20; 11 between 20 and 25; 7 between 26 and 30; 7 between 30 and 40; 4 between 40 and 50; and 2 between 50 and 60. The *duration* of the purulent middle-ear inflammation had been, in 50 cases, from 1 to 10 years; in 15 from 10 to 20; in 6 from 20 to 30; and in one 32 years. Out of these 72 cases, 47 had simple caries, 13 caries and cholesteatomatous foci, and 12 pure cholesteatoma. The *mastoid antrum* showed in 42 cases no striking enlargement, in 12 it was abnormally small, in 18 abnormally large; in 5 of the latter the enlargement was "colossal," namely, in 5 cases of cholesteatoma.

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The writer remarked that the enlargement of the mastoid antrum took place at the expense of the cranial cavity. In 9 out of the 72 cases the disease extended to the *dura mater* (6 times towards the cerebellum, thrice above the tegmen tympani). In one case the dura above the tegmen was perforated, and *cerebral tissue* projected into the attic; in spite of this the patient got well. In another case cerebral tissue was found in the syringing water, and, as the operation showed, it came from the cerebellum, which had projected into a large cholesteatomatous cavity in the mastoid, which had also broken through into the meatus. His case also recovered. The transverse (lateral) sinus was frequently exposed, once in almost its whole extent as far as its passage into the bulb of the jugular vein; in many cases it was exposed by operative measures. In one case Prof. Urbantschitsch opened it, but found the sinus empty, and in its lower part thrombosed. The malleus and incus were found as follows:—

Out of the 72 cases the malleus was healthy in 8, carious in 62, absent in 2; the incus was healthy in 6, carious in 63, absent in 3; in two cases of caries there was an osseous anchylosis of these two ossicles. *The facial nerve* was in one case completely paralyzed before the operation, and in several cases paretic. The paresis disappeared quickly after the operation; the case with paralysis underwent no marked improvement. During the operative proceedings facial paralysis occurred in no instance, but in 6 it came on one or two days after the operation, but only lasted for a time. In one case the facial paresis affecting the upper eyelid passed over into a facial spasm.

Among the notable accidents during the operation Urbantschitsch mentioned the occurrence of severe arterial bleeding in two cases (from the region of the middle meningeal artery); once this required compression for ten minutes to stop it, and in the other case the operation had to be stopped and completed five days later. In the case of a girl, aged eight, there followed during the curetting of the left ear violent chronic spasms of the upper and lower extremity of the opposite side, and further spasmodic flexion of the fingers of that hand; these symptoms recurred several times during the day of the operation, but the case ended favourably. In a girl, aged eighteen, there came on after the operation general convulsions, which were repeated, but they were recognized at once as being of an hysterical nature, and the case progressed satisfactorily. In the case of a boy, aged eleven, a large sub-dural abscess was found in the occipital fossa. The case got well.

As regards the operative technique, the writer made the ordinary crescentic incision near the insertion of the auricle. The chiselling was carried out usually in the way described by Zaufal, but he never went higher than the upper margin of the meatus; the cutis of the osseous meatus was sometimes raised on the posterior and superior wall, sometimes used as a guide for the inexperienced operator while working towards the deeper parts. In other cases Prof. Urbantschitsch removed the upper and posterior part of the tympanic ring according to Stacke's method, and worked his way outwards towards the mastoid antrum. In favourable topographical circumstances safe points for guidance are in

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this method presented to the inexperienced operator. For those who have had much practice in it it is immaterial what method of opening is employed, and the writer usually follows Zaufal's method. He then described the method of curetting and transplantation of skin. In several cases he had carried out the Thierch-Ziebermann method with partial success, probably on account of the use of the pressure method, which he describes later on; on the other hand he had had very excellent results from the use of the cutis of the posterior wall of the meatus as recommended by Körner, more especially when only one incision was carried through the cuticulo-cartilaginous meatus as far as the external orifice, at which point two vertical incisions were carried upwards and downwards respectively so as to form flaps in the meatus (Panse).[1] The flaps were either attached by means of stitches or else by tampons, so that the artificial cavity was kept open as far as the outer orifice of the meatus, from which it could be easily examined.

The after treatment is looked upon by Urbantschitsch as the more difficult part of the radical treatment, and he attaches great importance to a skilled manipulation of the patient for several months. In the first rank comes the prevention of granulation formation and the destruction of granulations (too exuberant) when formed.

The tendency to the formation of granulations is to be combatted by continuous pressure upon the walls of the cavity exercised by means of a firm tampon. *The destruction of granulations* is effected by means of cauterization with crystalized chromic acid, and this has to be practised with due regard to the tendency to reaction in the individual under treatment.

As regards *the retro-auricular* opening, Urbantschitsch acts according to the nature of the case. In simple attic disease he stitches up the wound completely; otherwise he keeps a large fistulous opening by means of iodoform gauze, or a solid india-rubber cylinder, large enough to admit the little finger, until the tendency to granulation formation has passed, or is only slight and very little secretion remains. He is opposed to a permanent opening from cosmetic and social reasons, and more particularly since he has been able to obtain access to large cavities through the auditory meatus in cases in which he has slit up the soft parts of the meatus and turned back the flaps. It is only, then, in cases of very extensive caries, or in patients who are going to a distance, to places where skilled treatment cannot be carried out, that he has resort to the preservation of a permanent retro-auricular opening.

As regards the result of the treatment, he can give no positive statements on account of the short period of observation, which even in the longest of the cases has not extended over two years; but the following has been the *course* up to the present:—Of the 72 cases, 28 present a completely dry cavity, and this was attained in 13 cases in from 6 to 12 weeks; in 8 cases in from 3 to 4 months; in 4 cases in from 5 to 6

[1] This description does not tally with that which we are accustomed to recognize as Panse's method and which that writer describes in the "Arch. fur Otol." This roughly consists of the formation of a tongue of soft tissue from the postero-superior wall of the membrano-cartilaginous meatus by means of two parallel incisions in the direction of the meatus. This tongue is turned backwards, so as to cover the outer part of the posterior wall of the artificial cavity formed by the chiselling operation.

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months ; in 3 cases in 7, 12, and 16 months respectively. In 19 other cases, of which 12 have been under observation for 6 months, and 7 longer, the cavity is completely dry ; but there is occasionally a little secretion, even after a cessation of secretion for several months, but only in small quantity. In 4 patients the carious process has not yet been brought to a standstill ; 8 operated on in May and June of this year showed a satisfactory course as regards the operation wound ; 8 withdrew from further treatment ; 5 died, and of these 3 from meningitis, which was already present at the time of operation, one of abscess in the left temporo-sphenoidal lobe without localizing symptoms, and one of metastatic pneumonia.

The operation had extremely favourable results as regards *headache, vertigo, faintness, and the general bodily condition.* Out of the seventy-two cases, forty-two had had such symptoms ; among them was one of cholesteatoma with optic atrophy and marked contraction of the field of vision, which improved in a most striking way after the operation. Prof. Urbantschitsch dwelt further upon the favourable influence of the operation on the mental and nutritive functions, and further upon the *hearing power*, which sometimes was considerably improved. The writer pointed out how frequently the great danger threatening life was only discovered after the opening of the cavities of the middle ear. He concludes with the following words : "The more frequently cases of chronic suppurative inflammation of the middle ear, as also of cholesteatoma of the middle ear, are subjected to radical operation, the more clearly is the great value of this method of treatment impressed upon us, and so much the further does experience teach how wonderfully the operative interference is borne by the patient; also what favourable influence it exercises in different directions ; and, in point of fact, the operative opening of the cavities of the middle ear must be described as one of the most life-saving proceedings in aural surgery."

Dr. GOMPERTZ agreed with Profs. Politzer and Urbantschitsch in looking on the radical operation of the cavities of the middle ear as a life-saving procedure, but he insisted along with Prof. Politzer that the indications for the operation should be limited in the most precise manner. In particular, he dwelt upon the necessity of attention to the hearing power, because any interference with this handicapped the patient very severely in his social relations, and in cases in which the other ear was already useless for hearing, the widest scope should be afforded to conservative methods. As regards the question whether in deeper extending disease, caries and cholesteatoma, the retro-auricular opening should be closed or kept free, he thought it could only be solved by further observations. In general he preferred the plastic method recommended by Körner, and as much as possible he avoided the establishment of a lasting retro-auricular opening; but he was bound to admit that in cases in which such an opening was kept the new epidermis gave him the impression of being more solid than in cases in which Körner's method was adopted, and he thought that the constant contact with the outer air was of advantage in securing the stability of the healing process. In order to assure the safety of the stapes he advised that the tendon of the

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tensor tympani and the incudo-stapedio joint should be divided before the detachment of the auricle, because after this the field of operation was too much obscured by the hæmorrhage. For retracting the detached meatus he had found a gouge most suitable, and he recommended the use of a blunt hook hollowed out after the fashion of that instrument.

He had in one case observed tetanic contractions after the operation, but in this the anæsthetic had been administered for an hour, and the contractions soon stopped after the patient got warm in bed.

In the after treatment he recommended very strongly, in cases in which Körner's plastic method had been adopted, the use of sterilized vaseline oil. After the removal of the first dressing, cleansing and drying of the meatus, he filled this with oil, and then plugged it with iodoform gauze.

Prof. URBANTSCHITSCH, in reply to Dr. Gompertz, said that the hearing power in his cases was bad before the operation, and that after it in quite a number of cases it was improved. The operation was practised upon cases which had been long under treatment, and in which the appearances found at the operation indicated its necessity. As regards the indications it was difficult to fix them with precision, as not unfrequently it was found that the disease had extended deeply into the middle of the ear, and the mastoid process as far as the dura mater and the sinus, although no particular symptoms were present, and the patient's appearance was that of perfect health. The detachment of the posterior wall of the meatus gave rise to no great amount of hæmorrhage, and as he preferred to have as free a field of operation as possible for the separation of the incudo-stapedial joint, he therefore preferred first to remove the partition between the meatus and the mastoid. Periosteal stitches were always inserted when it seemed necessary. As regards the flap formation, he referred to his opening remarks.

Dr. KAUFFMAN advised in cases of cholesteatoma, especially when extensive or recurrent, the formation of a persistent opening behind the ear. The splendid results which he had seen from this method in Schwartze's clinic in Halle had determined him to practise the operation on a few patients in whom these indications were present; and, in particular, he called the attention of those present to a patient who, some years previously, had been operated on in Prof. Gruber's clinic, and in whom, in the September of the previous year, a recurrence had taken place with severe symptoms. After the establishment of a persistent large opening, the improvement which had taken place illustrated the great advantage of this method of operation.

Prof. POLITZER was of the opinion that, in this direction, it was necessary to specialize. When the cavity was small and there was granulation in the middle ear, the opening in the mastoid might be allowed to close. On the other hand, in the case of large cholesteatomatous cavities, the cosmetic objects had to be left in the background, and a persistent opening maintained, so that the patient might be in a position to wash out the cavity in the temporal bone, completely. If the opening is allowed to close, then the patient is under the necessity of seeking the help of a surgeon at short intervals.

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Prof. GRUBER expressed his opinion that the term, "radical operation," should be done away with, as conveying no meaning. The typical operation of Schwartze, when it removes the whole of the decided tissue, is quite as radical as any other, even though not so deep. Without attacking anyone, he felt that, in many cases, too much was done. In all cases his plan was, if the presence of disease in the deeper parts of the bone was not very obvious, to perform, in the first instance, Schwartze's operation, and when in the course of the operative procedures the necessity showed itself, he then went still further. On the whole he operated frequently, and was very satisfied with the results. He objected to the maintenance of a permanent opening in the mastoid region, unless there was the most unmistakable necessity for it.

Dr. FERDINAND ALT. *On Apoplectiform Labyrinthine Disease in Caisson Workers.*

Dr. Alt had the opportunity of studying the aural disturbances which occurred in caisson workers, during the progress of certain constructions under the water-level of the Danube. The number of the cases was very large, and he confines himself to the description of the three most severe which came under his notice. These three men had worked, during the prescribed part of four hours, under a pressure of from 2·2 to 2·4 atmospheres, and while they were in the caisson they felt perfectly well. The typical symptoms of Ménière's disease appeared in these men: in one at the end of an hour, in another in thirty-five minutes, and in the third in one and a-half hours after leaving the caisson. They had complete deafness, and continuous severe vertigo. In all three there was found well-marked retraction, and more or less pronounced livid discoloration of the membrane, along with congestion of the vessels of the malleus. The tuning-fork tests indicated labyrinthine affection on both sides. In two of the patients there was complete deafness of the left side, and in the third on the right side. This remained continuous, while in the other ear a slight trace of hearing power was preserved, and improved within a few days. As regards the circumstances under which ear disturbances occur in caisson workers, the writer mentioned that men working in a space in which there is, for example, a pressure of two atmospheres, have to practise movements of swallowing and Valsalva's method of inflation (which they do instinctively), in order to drive air into the middle ear and to equalize the pressure in that cavity and outside it. When this succeeds they can go on working in complete comfort, but if the Eustachian tubes are obstructed they get severe pain and other subjective discomforts in the ear, and they are obliged to leave the caisson. Occasionally, in spite of Valsalva's method not succeeding, they persist in remaining in the caisson, and, as a result, their organs of hearing suffer severely.

When the Eustachian tube is quite impermeable there is in the auditory meatus a pressure of 1 + 2 atmospheres, and in the middle ear of one atmosphere only (or even less, on account of the rarefaction of the air resulting from Eustachian obstruction); hence there is in the middle ear a negative pressure, the membrane is drawn inwards, the vessels find

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a place of less resistance, they dilate very markedly, and as the result of the obstruction to the exit of the fluids into the neighbouring parts owing to the pressure, there is a passive hyperæmia in the middle ear. As every increase of pressure in the middle ear leads also to a similar condition in the labyrinth, so rarefaction of air leads to a diminution of pressure in the internal ear (as proved by the manometrical investigations of Politzer and Bezold), and there results in the labyrinth a negative pressure with consecutive passive hyperæmia. By means of exhaustive studies of the disturbances of circulation Alt has proved that, as the result of this long continuous passive hyperæmia and the associated diminished nutrition of the vessels, there may occur a transudation, or it may be an actual hæmorrhage into the middle ear or labyrinth. In the slighter cases there was observed a retraction, and more or less pronounced injection of the membrane amounting at times to lividity. In a few of the cases there were ecchymoses in the membrane. Typical traumatic rupture of the drum was not observed. In the three very severe cases above mentioned the first idea was that there had occurred bilateral labyrinthine hæmorrhage, and it was only when the symptoms subsided with rapidity in one ear, the conclusion was arrived at that there was hæmorrhage and distraction of the tissues in one labyrinth only, whereas in the other the long-standing stasis had brought about transudation with secondary increase of pressure, so that the symptoms of labyrinthine disease were present, but disappeared when a readjustment of the secondary increase of pressure took place. In support of these views the writer alluded to the clinical symptoms on the one hand, and on the other to experiments upon animals which had been carried out in a high-pressure chamber constructed for the purpose. On the animals there were found ecchymoses of the membrane and hæmorrhage in the tympanum, or in some cases bullæ (Professor Gruber's experiment). In the microscopical preparations of the labyrinth which were shown at the meeting, it could be seen that the vessels were highly dilated, in some places even to double their natural size, and tightly packed with blood corpuscles (especially in the modiolus of the cochlea).

Dr. Alt then discussed the reason why the severe affections did not come on in the caisson, but only some time after leaving that chamber, and he attributed this circumstance to the changes in blood pressure, of which he demonstrated a number of curves. In the cases described he attributed the changes to pure mechanical causes brought about by the difference of pressure in the middle ear and the surrounding cavities, and he opposed the view that the symptoms were due to central disturbances on account of the negative results of examination of the nerves. Finally he gave a short account of the air bubble theory, and quoted a fatal case of air embolism in a caisson worker, in which there were numerous capillary hæmorrhages in the brain, and spinal cord. He asserted the possibility of the occurrence of labyrinthine hæmorrhages through the entrance of air bubbles, but as regards the cases observed he depends alone upon the mechanical theory in view of the otherwise negative appearances.

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Dr. JOSEPH POLLAK. *On Serous Perichondritis of the Nasal Septum.*

The patient was a robust and well-nourished man, aged fifty-three, who, without any obvious cause or any injury whatever, had for eight days suffered from complete obstruction of the nose, with the usual consequences: loss of nasal breathing, dryness of the throat, absence of resonance in the voice, etc. On examination the external orifices of the nose were found to be completely filled by two pale red tumours, which, at the first glance, simulated prolapsed nasal polypi. There was also on the dorsum of the nose, in the neighbourhood of the articulation, between the nasal bone and quadrangular cartilage, an elastic tumour of the size of a hazel nut, which had been incised a few days before by the doctor under whose treatment it was, and out of which there exuded under pressure a yellowish-white serous fluid of somewhat viscid consistency. When an endeavour was made to introduce the finger between the ala nasi and the bulging septum, so as to define the limits of the swelling and to test its consistency, the fluid spurted out like a fountain from the tumour on the dorsum of the nose; at the same time the tension of the tumour diminished, and the patient could for the moment draw breath through the nose. Next day the tumours were again fully distended, and the incision on the dorsum had healed. Dr. Pollak decided that the case was an undoubted one of the affection named by Jurasz serous perichondritis of the nasal septum, and determined to lay open the tumours without delay. After cocainization; the tumour on the left side was opened to the extent of one centimètre by means of the galvano-cautery, and two thimblefuls of serous fluid at once poured out. It was then found, as was expected, that there was a communication between the two tumours, and the use of the probe made it certain that the cartilage was broken through in a split-like way. After treatment was carried out by means of plugs of cotton wool soaked in ten per cent. Burrows solution. Complete healing took place in ten days, the nose became perfectly free; but there remained the characteristic depression of the dorsum of the nose peculiar to all forms of so-called perichondritis (phlegmon abscess of nasal septum), so that the appearance of the nose, which was previously a Roman one, was quite altered.

Dr. Pollak could not agree with Jurasz's view of the nature of such cases, that they were analogous to the perichondritis serosa described by surgeons (Ollier), and which usually occurs at the diaphysis of hollow long bones in young persons. The view expressed by Velpeau seemed to him much more plausible, who considered the disease which appeared to be the same as that described by Jurasz, to consist in a cyst formation in the septum. Fischenich avowed himself unable to give a sufficient explanation of the occurrence of serous perichondritis. Dr. Pollak thought that in serous perichondritis of the septum of the nose, just as in hæmatoma and the so-called acute idiopathic perichondritis of the septum, there was a primary diseased condition of the quadrangular cartilage analogous to that which Parreidt, Meyer, Gudden, and Pollak had described in the cartilage of the ear, and which was the condition predisposing to the occurrence of othæmatoma, namely,

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degeneration of the cartilage, softening and splitting, the formation of cavities with homogeneous contents, increased and new formation of blood vesesls. According to the nature of the injurious influence acting upon such degenerated cartilage, there resulted different forms of swelling of the nasal septum : thus, hæmatoma from injury, and the so-called acute idiopathic perichondritis (as Kuttner has correctly observed) from the immigration of pyogenic micro-organisms, and serous perichondritis from the rupture of cavities filled with serum. From these circumstances it will be obvious that in such cases the disease should affect both sides of the nasal septum.

Dr. GOMPERTZ. *On a Typical Change in the Tension of the Membrana Tympani in Valve-like Action of an Obstructed Eustachian Tube.*

The writer drew attention to a bleeding of the postero-superior quadrant, which now and then came under notice in membranes which were otherwise normal and without other disease of the tympanum. The patients in whom this anomaly is present generally complain of slight discomfort, such as a feeling of pressure or tension, or of slight subjective noises and occasional dulness of hearing. The appearance is very striking ; the colour of the membrane is the normal pearl grey, the light reflex is in its natural position, and the curvature of the three other quadrants is only very slightly altered. In the postero superior quadrant there is seen a marked bladder-like bulging, which at the part next the malleus stands out too sharply from the remaining portions of the membrane. On the periphery, near the wall of the meatus, there is seen invariably a longitudinal light reflex. The hearing power is only slightly affected, and in some cases is perfectly normal. The appearance under Siegel's speculum is most characteristic, as the affected part follows at once the condensation and rarefaction of the air in the external meatus, returning afterwards to its bulging position. On manipulation with the probe it feels like a miniature air cushion ; the movement of swallowing with closed nose leaves the convex position of this quadrant quite unaffected. In one of the cases Dr. Gompertz had tried the effect of multiple paracentesis, and for two days the position of the quadrant in question remained normal, but afterwards returned to its old position.

It was only by a consideration of the condition in the naso-pharynx that the writer came to associate the appearances with changes in the permeability of the Eustachian tube. The patients assert that even by the very gentlest act of blowing the nose they feel the impact of air against the drum membrane. There may therefore be perfect facility for the entrance of air into the tympanum, but some obstruction preventing its exit. In cases in which the naso-pharynx was examined there was found catarrhal conditions, hypertrophies of the mucous membrane, polypi, or suppurations in the accessory cavities. He was not quite certain as to whether in these cases certain swollen folds on the floor of the tube acted as valves, so as to allow of inlet but not of outlet of air, or whether, on the other hand, particles of mucos stuck in the narrow isthmus of the tube, so as to form a valve. He was, however, in a position to state that he had been able to remove this troublesome

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abnormality partly by simple treatment of the naso-pharynx, partly by the association with it of the use of the catheter and bougie.

Dr. GOMPERTZ. *Experiments in regard to the Closure of Old Perforations.*

He had carried out Okuneff's method, and had treated a number of "obsolete" perforations of the membrane by cauterization of the margins by means of trichlor-acetic acid. The results were very satisfactory, and out of ten cases he had in four brought about cicatrization of the perforation after a few applications of the caustic, and in one of these the whole of the lower half of the drum was affected as far as the periphery. In the remaining six cases the perforations diminished very materially in size. The process was carried out under local anæsthesia, by means of a ten per cent. solution of cocaine, after which the cauterization was effected by means of the thin probe, round the point of which a few threads of cotton-wool were twisted and moistened in deliquesced trichlor-acetic acid. The treatment is painful, but is very well borne by the patients. Naturally, it ought only to be employed in those cases in which the previous application of an artificial drum has proved that the closure is not likely to make the hearing worse. The writer found the appearance of the drum, after the cicatrization, particularly interesting. At the seat of the perforation there was always formed a grey, firm, lustreless membrane, which passed over, without a distinct margin, into the rest of the membrane. This appearance proved that the *substantia propria* could undergo regeneration during cicatrization, as he had previously stated. He did not think that this action was peculiar to trichlor-acetic acid alone, but that there might be other caustics which would produce the same effect. Why six of the ten cases had not yet completely healed depended upon the fact that the duration of the treatment was still too short. In the cases in which healing took place the hearing improved considerably, and in one of them the subjective noises disappeared which had troubled the patient for two years.

Dr. HAMMERSCHLAG. *On Respiratory and Pulse Movements in the Membrana Tympani.*

The writer gave an account of the literature of the condition, referring specially to the important works of Politzer, Lucæ, Mach, and Kessel. He described his own investigations carried on by means of an apparatus of his own construction, which was similar to the one used by Mach. Out of thirty observations on four young persons with healthy ears, the following results were obtained :—

The membrane showed consistent movements, synchronous with the systole of the heart.

The drum membrane, in quiet respiration, moved outwards during inspiration ; inwards during expiration. In quiet breathing through the mouth, these respiratory movements were less distinct.

He comes to the following conclusions :—

The tympanic cavity lies, under normal circumstances, in free communication with the naso-pharynx.

The expiratory stream of air draws the air out of the tube and tym-

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panic cavity, on the principle of the aëro-dynamic paradoxon, so that the drum membrane moves inwards.

The inspiratory stream presses in the tympanic cavity, and all the more easily because this is then the place of less resistance. Politzer's observations, differing somewhat from these, should stimulate to further and more extensive investigations, so that in the future the contradictions may be explained or set aside.

As regards the pulse movements, he remarked that similar observations had already been made by Politzer, Schwartze, Moos, Van Troeltsch, and others. The explanation of the pulse movements had already been sought for by other authors, and it depended upon this: that with each systole the lumen of the tympanic cavity was diminished, so that the membrane was forced outwards. He had no fresh explanation to offer, and considered this to be the correct one.

Prof. GRUBER then delivered a valedictory address.

Dundas Grant (*Trans. and Abs.*).

VIENNA SOCIETY OF LARYNGOLOGISTS.

Meeting, February 6th, 1896.

President—Prof. STOERK. *Secretary*—Dr. KOSCHIER.

WEIL. *Pathology and Treatment of Suppurations of the Sinuses, and especially of the Maxillary Sinus.*

After the previous discussions, the author had projected a comparative study of the various methods of treatment of suppurations of the sinuses, but has found this to be impossible, since there exist few statistics, and these contain but little detail and consequently are not of value. Nearly all authors adopt radical surgical methods, and the conservative treatment of irrigation through the natural openings succeeds only with few, who generally consider it difficult and producing bad results. Young authors go further. For example, for empyema of the antrum of Highmore they say that an opening for the evacuation of pus may be made at any point; they do not make further allusion to a natural opening. It is the same in all branches of the specialty where conservative methods, even when they may succeed, are not adopted like new operative methods, which become immediately employed. The young specialist who for the first time has to choose a method of treatment of empyema of the antrum will rather have recourse to the perforator or chisel, which will certainly give issue to the pus, and when his patient is cured he will ask if it had not been possible to avoid intervention.

Weil then discussed the results of his own experience of the conservative treatment. He has altogether met with about 96 different empyemas in 52 patients, and 23 suppurations of the maxillary sinuses in 17 patients. Of this number 7 were simple cases without complication; 5 of them were regularly treated and cured in a lasting manner, by 7, 12,

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