ABSTRACTS

EAR

The Internal Ear as a Manometer. P. J. MINK. (*Ann. d'oto-Laryngologie*, June, 1932.)

This article is a further statement of the writer's views on hearing, previously published in the *Annales* in 1930. He then described the action of the ossicles and explained how the membrane could communicate all variations in its relaxation to the stapes.

He now describes, by a study of the anatomical details, how sound in the form of pressure " inscribes " its modifications as endolymph currents in the middle ear ; these currents are to be considered as equivalent to the " inscription " made on the record of a gramophone.

Comparative anatomy shows that hearing is only a modification of the tactile sense ; the author, therefore, suggests that the auditory hair cells in the organ of Corti are brought into action, a given number at a time, by touching the membrane of Corti. This is done by raising the basilar membrane through movements of the endolymph. He describes a manometer which he has constructed and which functions in the same way as the cochlea.

He admits that the cochlea, if compared to a manometer, should also have a scale of measurement. He points out that the fasciculi of the auditory nerve enter the cochlea through approximately 4,000 canaliculi in the lower bony border of the spiral lamina. Each fasciculus in turn goes to its own external pillar ; these have been estimated at about 4,000. From these facts it is suggested that each external pillar, with the part of the striated zone attached to it, the associated group of auditory cells and supporting Deiter's cells, must be regarded as an anatomical unit with its own separate innervation (e.g. the segments of the common earthworm).

If we accept this point of view we must regard the striated zone of the basilar membrane as a series of " adjacent parts " to the external pillars, i.e. about 4,000. Therefore, as there are about 12,000 auditory hairs, three of these hairs are raised at one time to touch the membrane of Corti. This accords with the arrangement of the hairs in three rows, which we find in the organ of Corti.

In short, according to the writer, it seems much more reasonable to think that the cochlea acts like a manometer with a scale of 4,000 degrees than to regard it as a resonator such as Helmholtz described.

L. GRAHAM BROWN.

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Abstracts

Chronic hydrops of the Middle Ear and Mastoid. M. LANNOIS. (*Ann. d'oto-Laryngologie*, July, 1932.)

The author describes the case of a patient whom he has had under his care for the last twenty-four years, and who has suffered periodically during that time from effusion of fluid into the middle ear. He has been temporarily relieved by incision of the tympanic membrane, but has never been completely cured.

Lannois has never met with an identical case in his own practice, but he notes that other observers have reported similar ones. In this case operation was refused, but he feels certain that nothing short of a mastoidectomy to allow replacement of the whole mucous membrane of the mastoid cells and antrum by cicatricial tissue will ever cure the condition.

L. GRAHAM BROWN.

Facio-Labyrinthine paralysis "a frigore" and its pathogenesis. A. VAN CANEGHEM. (*Ann. d'oto-Laryngologie*, August, 1932.)

The writer describes three cases in detail to illustrate his thesis. His conclusions are as follows :—

Not every case of so-called "*a frigore*" facial paralysis is of otitic origin.

Mastoidectomy on an ear which is not diseased, even when it has been performed with perfect asepsis, affords a certain amount of danger.

The pains in the ear and auditory disturbances which one meets with in the history of patients suffering from facial paralysis "*a frigore*" do not prove the otitic origin of their affection.

Cold can cause some paralyses.

Facial paralysis "*a frigore*" is due to compression or infiltration of the facial nerve in the Fallopian canal by secondary congestion of the small branches of the stylomastoid artery. This secondary congestion, which may cause simple vascular dilatation, but which by alteration of the vessel wall can also permit a serous or even hæmorrhagic exudation, follows a primary phase of vaso-constriction.

If the vascular changes extend deeply enough, and especially if they affect the endolabyrinthine branches of the stylomastoid artery, vestibular and cochlear disturbances may follow which can end in complete abolition of vestibular function and total deafness.

L. GRAHAM BROWN.

Acoustic Trauma in relation to the "Tonuslehre". K. WITTMAACK. (*Arch. Ohr-, u.s.w., Heilk.*, 1932, cxxxiii., pp. 181-98.)

In animal experiments the organ of Corti can be injured either by *air-conducted* or by *bone-conducted* sounds. The lesions which

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result are quite distinct and unmistakable, so that by an inspection of the cochlea one can decide which type of acoustic trauma was used.

An injury to the cochlea by sufficiently intense and prolonged *air-conducted* sounds leads to a characteristic total disappearance of the organ of Corti, sensory cells as well as the supporting framework being affected. The cochlea with its independent system of fluid pressures (Tonuslehre) has been compressed from the region of the scala vestibuli against the basilar membrane.

On the other hand, in *bone-conducted* sounds intensive enough to cause an injury, the vibrations have reached the basilar membrane direct from the bony capsule, and the organ of Corti is compressed against the labyrinthine fluids in an opposite direction. Under these circumstances, only the sensory cells degenerate, while the supporting framework remains intact.

Micro-photographs of cochleae which are said to illustrate the two types of injury are convincing. Nevertheless, Prof. Wittmaack's theoretical explanations are difficult to follow and one cannot help feeling some sympathy with the critics of the " Tonuslehre ".

The acoustic trauma produced by bone-conducted sounds can be imitated by rotating guinea-pigs in such a manner that a centrifugal fluid pressure is produced against the basilar membrane. From the side of the scala tympani the organ of Corti is thus compressed against the endolymph of the cochlear canal and the perilymph of the scala vestibuli and identical lesions result.

J. A. KEEN.

The Anatomical Basis of Reflex Earache. A. GÜTTICH. (*Z. Laryng.*, 1932, Band xxiii., pp. 340-4.)

Pain referred to the ear is often found in dental disease, but ear disease never causes pain referred solely to the teeth. Therefore, in the author's opinion, the explanation of reflex earache by the " common innervation " through the trigeminus is not satisfactory, otherwise reflex toothache should be as common as reflex earache. Most authors believe that the pathway taken by referred pain from the teeth is *viâ* the otic ganglion to the tympanic plexus. This again does not explain why dental otalgia is nearly always associated with *lower jaw* conditions and hardly ever with diseased teeth in the upper jaw.

A factor of great importance in the explanation of reflex otalgia is *swelling of the submaxillary lymphatic glands.* In cases of dental otalgia there is usually some tenderness on pressure over the submaxillary triangle, or there may be actual swelling of the submaxillary group of lymph glands, which lie in close contact with the internal jugular vein and the *vagus* nerve trunk. This group

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of lymphatic glands probably derives a sensory nerve supply from the vagus. Any inflammation in this group of glands will easily irritate the vagus and may cause pain which is referred to regions supplied by the vagus. The important branch in this respect is the *auricular branch* which leaves the vagus just after its exit from the jugular foramen.

The same explanation holds for reflex otalgia in tonsillitis and in tuberculous laryngitis (*viâ* the superior laryngeal nerve to the vagus). Further, dental disease in the upper jaw seldom causes an inflammation of the submaxillary group of glands. Middle-ear disease cannot cause toothache, because otitis media does not involve the submaxillary group of lymphatic glands, neither is there a nervous connection between these glands and the lower jaw.

J. A. KEEN.

Ocular Pain in Auricular Suppurations. A. MOULONGUET. (*Ann. d'oto-Laryngologie*, October, 1932.)

From his clinical, pathological and therapeutic study of this subject the author concludes that the appearance of ocular pain in the course of an aural suppuration generally denotes the extension of the infection deeply into the petrous bone ; or indicates an osteitis of this bone, either superior (by far the most frequent case), with insufficient drainage of the attic and invasion of the cells of the roof of the tympanum, or posterior, reaching the posterior endocranial surface. In both cases the pain in the eye signifies the injury to the meninges innervated by the recurrent nerve of Arnold. Cases of apical infection of the petrous are much more rare, especially if one intervenes with a radical mastoid operation before the lesions are allowed time to evolve.

His line of treatment is based on these pathogenic considerations and on the length of time the ocular pain persists. Thus, in the first case, when the ocular pain appears during the first seven days of an acute suppurative otitis, he contends that the pain is due to a simple congestion or to compression of the tympanic plexus. Here incision of the drum-head is all that is indicated.

Secondly if the pain persists or appears after the first seven days it signifies an infection of the petrous with implication of the meninges on the anterior or posterior endocranial surface. A complete mastoidectomy must be performed with exposure of the dura mater in front of the lateral sinus in order to clear the posterior endocranial surface of the petrous. This is followed by a partial radical operation in order to explore the roof of the tympanum towards the zygomatic root ; laying bare the anterior endocranial surface of the petrous. Thirdly, if the pain appears or persists for more than three days after the mastoidectomy, a complete radical mastoidectomy is indicated.

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Lastly, if the ocular pains persist or appear after the complete radical operation, one must suspect the propagation of the infection towards the apex of the petrous. One must then consider more complicated types of operation, such as those of Kopetsky and Almour and of Quénu-Sébileau in order to reach the infected focus.

L. GRAHAM BROWN.

NOSE AND ACCESSORY SINUSES

The Clinical Testing of the Senses of Smell and Taste. CÆSAR HIRSCH. (*Münch. Med. Wochenschrift*, Nr. 31, Jahr. 79.)

Hirsch adopts Börnstein's sub-division of odoriferous substances into those of smell in the narrow sense such as wax, aqua rosæ, aqua amydalæ amaris, oil of lavender and sulphate of ammonium, those which stimulate the tactile sense such as menthol and sal ammoniac and those which stimulate the component of taste such as chloroform (sweet) and pyridine (bitter).

Having shortly considered the relative anatomy and physiology the writer reviews extensively the various anomalies of smell as well as the analogous disturbances of taste (hyper-, hypo-, para-, and a-guesia).

Hirsch uses an apparatus which he designates a "Geruchs-harmonium" in which the various substances of Börnstein's sub-division are graduated and arranged stepwise, so that when in clinical use the patient's olfactory area can rapidly be stimulated by the various substances. Owing, however, to the rapidity with which the olfactory sense gets tired, it is necessary to allow a short period for recovery between the individual tests. Each nostril is tested separately and then the two together. The sense of taste is tested immediately afterwards. A piece of mounted cotton wool moistened with various strengths of sugar or alternatively a solution of salt, citric acid or quinine salts is applied to the point of the tongue, the base of the tongue and the sides of the body of the tongue. Three illustrative case records are appended. These show the various substances used as well as the strength of solutions.

J. B. HORGAN.

Primary Cholesteatoma of the Frontal Bone. O. KAHLER. (*Z. Laryng.*, 1932, xxiii., pp. 227-35.)

The tumours which Professor Kahler discusses in this article are extremely rare and are sometimes called *epidermoids*. The majority of the cases previously described are examples of secondary cholesteatoma connected with old-standing frontal sinus suppuration. The author describes two cases of his own with full clinical

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details, including the reproduction of the X-ray appearances. There was no communication between the cholesteatoma cavity and the frontal sinus in either case ; therefore both were instances of primary cholesteatoma.

Certain histological features are said to be characteristic of these " epidermoids ", and these were well shown in Case 1. In the fibrous tissue outside the lining of stratified epithelium there is a dense network of *elastic fibres*, which are never seen in the lining of secondary cholesteatoma. It must be added that some authors (Ulrich, Hesse) disagree, as they have also found scattered elastic fibres in secondary cholesteatoma. The sections of Case 2 were less characteristic ; no stratified epithelium was found in the lining and the cyst contents resembled the contents of an old hæmatoma. There was a history of an injury to the head as a child, nearly thirty years before. The bone cyst in this case, although primary as regards the frontal sinus cavity, was probably a post-traumatic cyst rather than a cholesteatoma.

A differential diagnosis must be made from mucocele, and here the X-ray appearances are very helpful. For comparison the author reproduces the X-ray photograph of a typical ethmoidal mucocele which penetrates into the frontal sinus.

The operation for primary cholesteatoma must always be from the outside, and no communication must be made with the frontal sinus and the nasal cavity. If the dura is exposed by the bony erosion, one must not remove the cholesteatomatous masses which lie in close contact with the dura. One of Professor Kahler's early cases died of meningitis as a result of too thorough a removal of the cholesteatoma lining near the dura.

J. A. KEEN.

The Ætiology of Ozæna. O. FLEISCHMANN. (*Arch. Ohr-, u.s.w., Heilk.*, 1932, cxxxiii., pp. 199-250.)

The very extensive literature on the cause of ozæna is reviewed (three pages of references). The author supports an *embryonic theory*, viz., an inborn deficiency (" Entwicklungshemmung ") of the nasal mucous membrane. This deficiency is inherited according to Mendelian laws, an assumption which is supported by a large body of evidence. The defective mucosa shows a very poor resistance to infections and injuries of all types. Some of the pathological features in atrophic rhinitis are those characteristic of old age (shrinkage, diminished secretion). In the predisposed subject these *senile changes* set in at a comparatively early time of life.

The problem of inheritance is complicated by the fact that only the tendency to atrophic rhinitis is transmitted, not the actual condition. Other external factors must be present if ozæna is to

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show its full development. The characteristic symptoms have never been observed in new-born infants. In Portugal and Brazil fully developed ozæna is sometimes seen in children aged 2, but in northern climates it does not usually become manifest until puberty. Not infrequently the development of ozæna is delayed until adult life.

The study of the *bacteriology* of ozæna has not led to any definite results. The organisms which are found belong to the saprophytes. It is now accepted that syphilis is not a factor which enters into the ætiology. The Wassermann reactions in the blood and cerebro-spinal fluid are always negative, and positive results must be looked upon as accidental infections.

Much research has been devoted to the *bony changes in the skull* accompanying ozæna. These changes are limited to the skull and do not affect the long bones. They are primary changes and are not secondary to the atrophic process, with one exception, viz. the accessory sinuses. The tip-tilted nose with its sunken bridge, the short and broad hard palate are signs of the same "Entwicklungshemmung", the infantile type of facial skeleton persisting. The accessory sinuses are frequently small, especially those which develop late (frontal, sphenoidal). This is most likely a secondary effect due to the changes in the mucous membrane.

Endocrine influences have been studied, but the published observations are full of contradictions.

Many rhinologists support theories based on *trophic influences*, particularly affections of the *spheno-palatine ganglion*. Changes in the ganglion cells are more easily explained on the theory of a congenital "Entwicklungshemmung", which would also extend to the nerve supply of the parts.

A very definite distinction must be made between *genuine ozæna* to which the above considerations apply, and *secondary ozæna* as found, e.g. in syphilis, with old foreign bodies, in scleroma and leprosy. Observers are not yet agreed whether these special infections should be classed among the external factors which will cause an ozæna when the congenital predisposition is present, or whether they can cause true atrophic changes in the absence of the predisposition.

J. A. KEEN.

TONSIL AND PHARYNX

Lung Complications following Tonsillectomy. P. G. GERLINGS. (*Acta Oto-Laryngologica*, Vol. xviii., Fasc. 1-2.)

The best-known lung complication following tonsillectomy is abscess, while post-operative pneumonia is seldom mentioned, although, in the Author's opinion, it is a much more frequent

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occurrence than is generally supposed. He gives particulars of six cases in a series of 2,000 tonsillectomies, and two cases following removal of adenoids.

It is noteworthy that in four of the cases the operation was performed within two or three weeks of an acute tonsillitis. It is, therefore, important to allow an interval of at least four to six weeks to elapse, and every care should be taken to prevent aspiration of blood and saliva during the operation.

The Author believes that, for want of careful physical and X-ray examination, slight post-operative pneumonias not infrequently remain undetected, and that this complication is a much less uncommon cause of pyrexia following tonsillectomy than is usually believed.

THOMAS GUTHRIE.

The Pathology and Physiology of the Tonsils. GEZA HALASZ (Budapest). (*Acta Oto-laryngologica*, Vol. xviii., fasc. 1-2.)

The indications for tonsillectomy represent a subject in a state of evolution. New complications of tonsillar origin are recognised daily and we are only at the beginning of our task concerning a more precise diagnosis of pathological states of the tonsil.

The removal of a tonsil whose condition appears clinically to indicate the operation does not always prove to be justified, whereas the removal of harmless looking tonsils may assist in the cure of tonsillogenous ailments. The size of the tonsil does not dictate what should be done, certainly not in children, unless its size interferes with nutrition and respiration.

Hypertrophied tonsils in adults are often absolutely healthy, whereas small, hardly visible tonsils may cause grave complications.

Chronic inflammation of the tonsils is a regressive not a proliferative change. The glandular element diminishes but the connective tissue tends to predominate—a return to a feeble state of differentiation corresponding to the regressive evolution of Ribbert. This state may come about by repeated irritations as well as by natural wear and tear or senile change. A state of negative allergy results, in which condition the tonsil is incapable of reaction either to acute inflammations or to chronic infections. The bacterial filter becomes a harbour for bacteria.

The presence of detritus is not necessarily a pathological sign, and isolated attacks of inflammation without complications may mean they are still capable of function and not to be condemned.

The writer goes into the question of the bacteriology of the tonsils and thinks that the presence of bacteria which are known to cause serious disease elsewhere is an indication for removal.

The interesting subject of an endocrine function of the tonsil is considered and, referring to the theory of Voss that the tonsil

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retards growth, the writer believes that his own experiments with rabbits tend to confirm the view. Injections of tonsillar extract free from albumen were used and with this extract he also claims relief in pharyngitis, particularly in tonsillectomised subjects (" pharyngitis tonsillopriva " Pollatschek). Reference is made in comparison to the beneficial effect of insulin in diabetic pharyngitis and in laryngitis sicca.

The writer concludes his paper as follows :—" The hormone of the tonsils is included in the circuit of correlations in so far as the inhibiting substance retards the growth of the individual, but on the other hand a specific hormonal action works by a vascular regulation carried out beneath the mucous membranes of the upper respiratory passages."

H. V. FORSTER.

LARYNX

The Treatment of Papilloma of the Larynx. W. PFEIFFER. (*Z. Laryng.*, 1932, xxiii., pp. 280-99.)

The author discusses the very varied methods of treatment for laryngeal papilloma, based upon a thirty years' experience of such cases at Professor Spiess's Clinic in Frankfurt. The clinical histories of the patients (mostly children) and all the important points are given in tabular form.

Dr. Pfeiffer pays special attention to the technique of X-ray treatment, its advantages and risks.

Two unusual methods of treatment are mentioned :

1. The submucous injection of 1-2% *novocain solution* into the true or false vocal cords, wherever the papillomata have been removed. According to Professor Spiess, this procedure tends to prevent a recurrence by influencing the nervous supply of the part.

2. Cauterisation of the papilloma-base by *solid* CO_2 *snow.* The author warns us against the use of fuming nitric acid, which is said to be employed as the caustic agent of choice in many German Clinics.

J. A. KEEN.

ŒSOPHAGUS AND ENDOSCOPY

The treatment of Hypopharyngeal Pouches in their early stage. A. SEIFFERT. (*Z. Laryng.*, 1932, xxiii., pp. 256-8.)

Diverticula of the hypopharynx are also described as " pro-pulsion pouches ". They are probably due to a disturbance of the nervous mechanism which controls the opening and closing of the œsophageal entrance in relation to the act of swallowing. A weak area exists between the circular and the descending fibres of the lower

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constrictor (Laimer's triangle), and the pouching begins in this particular area of the posterior wall of the hypopharynx.

Professor Seiffert describes a new operation which consists in the careful *division of the band of circular fibres* of the lower constrictor muscle, an operation which can be done without injuring the mucous membrane or opening into the hypopharynx.

In the single case which forms the basis of the present article, all the difficulties of swallowing disappeared. The pouch, which had already assumed very obvious dimensions and contained old food particles, gradually receded and disappeared spontaneously.

J. A. KEEN.

Healing of an Œsophageal Carcinoma following intensive deep X-ray Therapy. H. HOLFELDER. (*Z. Laryng.*, 1932, xxiii., pp. 353-61.)

Deep X-ray therapy is recommended for carcinoma of the œsophagus in preference to " radon seeds ".

The patient was a man aged 65; œsophagoscopy showed a neoplasm in the upper third of the œsophagus and sections of an excised piece proved this to be a typical epithelioma.

The deep X-ray treatment extended over forty days. Five weeks later the patient could swallow normally and began to gain weight. Unfortunately the patient succumbed to a double broncho-pneumonia six months later. The *post mortem* showed a perfectly smooth linear scar on the anterior wall of the œsophagus, 8 cm. below the entrance. This area was firmly adherent to the trachea, which showed a corresponding small traction diverticulum on its posterior aspect. The naked-eye appearances left no doubt that the malignant neoplasm had completely yielded to the X-ray treatment.

A table shows the exact dosage of the X-rays and the methods of irradiation which were used. Several X-ray photographs of the œsophageal stricture, reproductions of the cut sections, and clear photographs of the *post mortem* appearances of the œsophagus and the trachea complete a very interesting case-record.

J. A. KEEN.

REVIEWS OF BOOKS

The Discharging Ear. By ARTHUR G. WELLS, B.S., M.B., D.P.H., J.P. Published by John Bale, Sons & Danielsson, Ltd. 2s. 6d. net.

In this little book the author runs over the various causes of otorrhœa and indicates their treatment. The minor surgery of

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