sources of error. Based upon the theory of Wittmaack that it was essentially due to the vibrations from the floor, carried through the body to the ear, that the labyrinth was injured, many efforts had been made in Germany to isolate the different floors in the machinery shops from each other. It was—for economic reasons—very important to decide whether the lesion was due to the effect on the ear of sounds coming through the body, or to that of sounds coming from the air.

During the War it was noticed that after the men had been near discharging guns for several hours a retraction of the drum membrane occurred, but it soon disappeared.

# ABSTRACTS

## EAR

*Osteomyelitis of the Inferior Surface of the Petrous Pyramid.* WELLS P. EAGLETON. (Newark, N.J.) (*Jour. A.M.A.*, August 15th, 1936, cvii, 7.)

Because of the peculiar nature of the bone, the pathological process in the vast majority of cases has a tendency to spontaneous cure. In about 15 per cent. suppuration takes place, and well directed treatment may be successful, while in about 5 per cent. of invasive forms of thrombophlebitis the disease is uniformly fatal.

The petrous apex, from a pathological and surgical standpoint, is divisible into three sections. First, the marrow-filled osseous matrix itself with its dural coverings on the anterior and posterior surfaces; second, the domain of the carotid canal containing the carotid artery and the carotid venous plexus; third, the inferior "cribriform" perforated plate on the pharyngeal surface of the apex. Surgery of the apex resolves itself into two distinct lesions, namely, abscess-formation, which requires evacuation, and infective thrombophlebitis of small vessels, which requires expectant treatment until it in time either undergoes resolution or breaks down into pus. Enlargement of any fistula found in the region of the tympano-mastoid usually furnishes adequate drainage.

Mastoiditis in infants runs the course of a true suppurative osteomyelitis, that is, suppuration within bone marrow spaces. After the third year of life no trace of fat marrow is found within the region of the mastoid apophysis and mastoiditis after the second year is generally a local osteitis. Glandular enlargements and lateral



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pharyngeal abscess is a frequent complication of otitis media in infants.

Suppuration of the mastoid very frequently follows otitis but a purulent collection of pus in the petrous apex is rare although X-ray will often show infection to be present. Osteomyelitis of the apex is rare, especially while the apices are growing. It is characterized by a disappearance of all apical meningeal symptoms with a continuation of the signs of bone sepsis, since the suppuration is under the carotid artery and away from the dura. A chill followed by a swinging temperature may lead to the erroneous diagnosis of lateral sinus thrombosis. The lateral pharyngeal wall should be inspected frequently since abscesses may extend into the vault of the pharynx posterior or medial to the Eustachian tube, causing partial unilateral nasal obstruction or even regurgitation of food into the nose.

ANGUS A. CAMPBELL.

*Osteoplastic and Osteoclastic Changes in the Petrous Bone due to Carcinomatous Infiltration and their Relation to Otosclerosis.* A. GREIFENSTEIN. (*Arch. Ohr-, u.s.w. Heilk.*, 1936, cxlii, 231-47.)

The petrous bone may become infiltrated by a malignant tumour growing in the immediate neighbourhood or it may be the seat of a metastatic deposit. The sections of such bones often show a striking resemblance to foci of otosclerosis. In one preparation of a temporal bone in the author's possession only a small area of the petrous tip and the labyrinth capsule were free from infiltration. In the mastoid process the cells were narrowed and partly obliterated by newly-formed endosteal bone. The air spaces were filled with newly-formed fibrous tissue with only a few scattered carcinomatous cells. But in the subdural region there were large deposits of carcinomatous cells, also in the marrow space immediately surrounding the bony labyrinth. In the same specimen the labyrinth capsule showed typical otosclerotic changes. In the area of predilection in front of the oval window there was a circumscribed area of blue stained bone (hæmatoxylin eosin). Other blue staining areas with bony changes resembling otosclerosis were seen around the vestibule and near the lateral semicircular canal. This newly-formed bone contained few fibrils and stained like young otosclerotic bone. The network arrangement of the bone also resembled otosclerosis.

A second temporal bone belonged to a man, aged 48, with epithelioma of the right tonsillar region. The neoplasm had reached the base of the skull and had penetrated into the petrous bone as far as its upper surface. Epitheliomatous cells were seen in all parts of the bone, except in the bony labyrinth. The bony structure showed active changes, both of absorption and of new



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formation. Again the newly-formed bone stained a deep blue like young otosclerotic bone and showed the same network arrangement.

J. A. KEEN.

*On the Tonic and the Dynamic Function of the Cristae.* EELCO HUIZINGA. (Groningen.) (*Acta Oto-Laryngologica*, 1936, xxiv, 1.)

A clear distinction is generally made between dynamic and static labyrinth reflexes, the former are attributed to the cristae, the latter to the maculae. The author, however, suggests that a sharp distinction does not exist. The essential point is that both kinds of end organ exert a tonic influence on the musculature (Labyrinth tonus of Ewald).

There is a great difference in the importance of these reflexes and in the distribution of labyrinth tonus in the various test animals. In pigeons, when the dynamic reflexes are pronounced, there is a strong influence passing continuously from the cristae, chiefly affecting the neck muscles. The dynamic and the tonic functions can be separated from each other by dividing the semicircular canals. After this operation the acute symptoms are due to the loss of the tonic function, which may be restored, but the dynamic function is permanently lost. None, or very little, rotatory function remains and eventually a permanent closure of the canal in all cases can be confirmed by microscopical examination. The author collected ten pigeons in which every canal had been divided and yet the birds could fly normally afterwards, even on homing flights. Full compensation for the loss of the dynamic function of the semicircular canal apparatus can be acquired. The sense of localization of the homing pigeons remains intact.

It could be proved that strong tonic reflexes continued to leave the cristae of the test animals and that the cristae could be stimulated by sound, as Tullio has described.

[The above is an abstract of the Author's conclusions.]

H. V. FORSTER.

*The Pathological Changes found in a case of Otosclerosis.* ALBERT A. GRAY. (London.) (*Acta Oto-Laryngologica*, 1936, xxiv, 1.)

Towards the end of the year 1934 the writer received the temporal bones of a medical man who, having been deaf during most of his life, left instructions in his will that his ears should be examined after death. He was born in 1848 and died on November 7th, 1934. In childhood there was a history of some discharge from the left ear but this left no permanent perforation of the drumhead. He began to show signs of deafness between the ages of 40 and 50



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and by the year 1915 was compelled to use a speaking tube. In 1916 he had a severe illness associated with attacks of giddiness during which he fell down, and deafness became complete but tinnitus disappeared. When examined by Dr. Kerr Love in 1921 there was no response to tests with tuning forks of the middle and lower range, but with Galton's whistle notes of over 2,048 D.V. could be heard.

After describing the macroscopic and microscopic examination of each ear the author draws attention to some points of particular interest. In the first place a large area of osteoporotic bone in the left ear was found and yet no similar change was to be found in the bone of the right ear. This unusual condition of asymmetry was the first example in the writer's personal experience, though a similar case had been described by Manasse.

Another interesting finding was the absorption of a portion of the newly-formed osteoporotic bone in the region of the anterior extremity of the oval window, a condition unlikely to be attributed to old age.

The most important aspect of the case, however, was the paucity and comparatively trivial nature of the pathological changes when taken in conjunction with the extreme degree of the deafness which could hardly be attributed to old age. The pathological changes of deafness in old age are quite characteristic and have been described by the writer in a recent paper.

As he felt driven to conclude that the extreme degree of the deafness was to be attributed to pathological changes in the central auditory nuclei and their intracerebral communications he hoped that the brain and the medulla in the case would be examined later for demonstrable pathological changes to account for the deafness. H. V. FORSTER.

*Histological Diagnosis of Hereditary Deafness.* W. LANGE (Leipzig). (*Zeitschrift für Hals-Nasen-und-Ohrenheilkunde.*)

The author quotes fourteen cases, seven of which showed definite evidence of labyrinthitis, but these cannot be regarded as of hereditary origin. Of the remaining cases, one showed malformation, and five, pathological changes of the endolymphatic spaces of the ganglion spirale and the nerves. The changes were degenerative and atrophic. In one case the findings did not explain the deafness.

The author further examined fifty-one cases between 70 and 90 years of age with special regard to the ganglion spirale. In twenty-two cases there was scarcity of cells in the ganglion ; in nine cases cells seemed to be fewer than normal, while in the remaining thirteen the cells appeared to be normal. Lange draws the conclusion that the deafness of old age, as shown by the state of the ganglion, is due to a degeneration of the cochlea. F. C. W. CAPPS.



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# Nose and Accessory Sinuses

*Clinical and X-ray Examinations on the Relation of Pneumatization to the Course of Acute Otitis Media.* Dr. Hermann Barth. (*Zeitschrift für Hals-Nasen-und-Ohrenheilkunde.*)

Cases reported number 717, 510 of which required surgical treatment (antrotomy). X-ray examination is of value in so far as it gives a good view of the extension of the cells.

Cases recorded are sub-divided into five groups according to their degree of pneumatization.

Acute otitis media occurred most frequently in cases with a good pneumatization. On the other hand, where there was a sclerosis of the mastoid, the infection usually subsided without operation. Furthermore, at operation the latter group generally showed only slight pathological changes.

Complications arose more often in cases with a good cellular development. Even if there is a relationship between pneumatization and the course of otitis media this is not sufficiently regular to aid the prognosis.

F. C. W. Capps.

*Researches on the Functional Asymmetry of the Organ of Hearing.* A. Zakrzewski. (*Polski Przeglad Otolaryngologiczny*, xii, 3-4, February, 1937.)

The author has tested with the otoaudion the acuity of hearing of each ear in seventy-three persons aged 20 to 24 years, with a view to determining which ear is dominant in each case. He demonstrated the predominance of the left ear in thirty-six people, and the right ear in twenty-eight, while in nine the hearing was equal on the two sides. He also showed that in the nine persons with identical hearing in each ear the localization of sounds was more exact. The description of the experiments is prefaced by a review of anatomical and functional asymmetry of the ears and of the present knowledge concerning auditory dominance.

Douglas Guthrie.

## NOSE AND ACCESSORY SINUSES

*The Surgical Correction of Traumatic Deviations of the Septum in Children.* (Paper read at a meeting of the Société de Laryngologie de Paris, June 15th, 1936.) Ombrédanne and Caussé. (*Les Annales d'Oto-Laryngologie*, November, 1937.)

These authors contend that the customary diffidence in operating on the deviated septa of children is exaggerated. They supported this contention by bringing before the meeting two cases upon whom



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they had operated with extremely good results. One of these was a child of 1 year and the other of 6½ years. Full clinical details were presented and a paper was read which called attention to the alleged difficulties of such operations and discussed the pros and cons with instructive impartiality. These alleged difficulties were discussed under the following headings: (1) Difficulties of the operation; (2) The risk of post-operative infection which might lead to a perichondritis and a falling in of the nose; (3) Subsequent troubles consequent upon growth. With regard to (1), it must be admitted that the limited accessibility, the fragility of the mucous membrane and the increased adherence to the underlying cartilage, make the operation more difficult. But the chief objection that local anæsthesia cannot be used for this operation in children does not influence the authors, as they contend that the operation of sub-mucous resection can be perfectly successfully performed under general anæsthesia. They do not consider the risk of post-operative infection is any greater than in similar operations on adults. In conclusion the authors contend that although one would avoid operating on children, it would be bad surgical practice to leave septal deformity uncorrected when the deformity was obviously interfering with the child's development.

There was an active discussion following the paper: ROUGET said that in the Children's Hospital to which he was attached, twelve to fifteen cases a year were operated upon, but only where there was complete obstruction on one side and only when the docility of the child permitted an operation under local anæsthesia. He had never operated on a child under general anæsthesia.

BLOCH agreed with the authors that non-traumatic deviations should never be operated upon before the age of 15.

BOUCHET had observed many very poor results after septal operations in children, particularly owing to the formation of synechiae. In cases of complicated obstruction, his advice is: leave them alone.

BOURGEOIS recalled that Lermoyez was a very prudent man, and that he stated dogmatically that children should not be operated upon for deviated septa. He had had cases in which an operation in a young subject had resulted in a nose of the shape of a tapir. This was due to the growth of the nasal bones without a corresponding growth of the cartilage.

The President, MOULONGUET, summing up the discussion drew attention to the fact that sometimes parents attributed a nasal obstruction to trauma whereas in reality, it was due to a spontaneous deviation previous to the accident. In any case, all were in agreement that sub-mucous resection in children should be carried out as seldom as possible.

M. VLASTO.



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# Nose and Accessory Sinuses

*The Treatment of Ozæna by Bacteriophages.* A. ZAKRZEWSKI and J. WIZA. (*Polski Przeglad Otolaryngologiczny*, xii, 1-2, January, 1937.)

The writers have treated ozæna by filtrates containing the specific bacteriophages of the organisms found in the nasal cavities of the patients. In twenty-six patients the following bacterial flora was discovered :

B. Abel-Lönenberg, 23 ; B. Belfanti, 22 ; B. Perez, 4 ; Pneumococcus, 11 ; diph. catarrhalis, 8 ; staph. albus, 20 ; staph. citreus, 10 ; staph. aureus, 6 ; streptococcus, 3 ; b. diphtheriae, 1 ; b. coli, 4 ; b. proteus, 13 ; pyocyaneus, 1 ; B. Friedländer, 1.

The bacterial filtrates corresponding to the organism discovered in each case were applied on wool tampons to the nasal cavity and left in position for two hours, the procedure being repeated at intervals of 3 to 10 days.

In the thirteen successful cases the fœtor diminished, the mucosa became more moist and red and the crusts less adherent, nevertheless relapses were noted in all cases within a few weeks after cessation of treatment.

DOUGLAS GUTHRIE.

*Lymphosarcoma of the Sphenoid simulating Rhinogenic Meningitis.* Dr. FRITZ HANDKE. (*Zeitschrift für Hals-Nasen-und-Ohren-heilkunde.*)

Malignant tumours arising from the sphenoid are comparatively rare, and a diagnosis was possible only at autopsy. The patient was 43 years of age and had a history of recurrent sinusitis affecting the frontal sinuses and antra at intervals over a period of more than twenty years. During the last three years he was continually being treated with lavage of the sinuses. In July, 1935, his right antrum was operated upon, but the purulent discharge did not cease. On September 25th he complained of diplopia. He was then operated upon, the right frontal sinus, ethmoid and sphenoid being opened at Munich University. One month later he was admitted into the Berlin Clinic. There was purulent discharge from his right nostril, granulations being present on the lower turbinate. It was possible to introduce a sound into the opened sphenoid as well as into the frontal sinus.

The differential blood count was normal. Blood sedimentation rate increased. X-ray examination showed darkness of all sinuses on the right. Pus could be washed out from all the sinuses. Histological examination of the granulations showed no tumour or specific inflammation. The fundus oculi was normal. There was a paresis of the abducens on the right. Further, there was a paralysis of the facial nerve on both sides (peripheral) but no other neurological symptoms.



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The patient then complained of headaches and sleeplessness, developed a temperature of 100° F. and was delirious at times. A diagnosis of basal meningitis was made. Lumbar puncture—Pandy's reaction positive, 160 cells per c.mm. in the C.S.F.

The patient was again operated upon, all the sinuses on the right being re-opened. Granulations and pus were found, but no new features. Histological diagnosis again showed only inflammatory tissue. The patient's condition then grew worse. He was either somnolent or delirious. Reflexes in both legs were absent. Cerebrospinal fluid: Globulin +, 160 cells but only lymphocytes. The patient died, in a comatose condition, four weeks after admission.

Autopsy showed a lymphosarcoma arising from the sphenoidal mucous membrane, invading the right pyramidal apex: acute serous meningitis and œdema of brain, chronic hyperplasia and purulent inflammation of all the sinuses. The tumour invaded only the endocranium and, therefore, it was not possible to get a histological diagnosis. The cerebrospinal fluid was examined only for the presence of lymphocytes, but, on the whole, the old chronic inflammatory process of the sinuses made the diagnosis very difficult, especially as the histological and X-ray examinations seemed to confirm the diagnosis of chronic sinusitis.

F. C. W. CAPPS.

*Healing of Chronic Sinus Suppuration without the disfigurement of a Surgical Procedure.* Dr. MUCK (Essen). (*Zeitschrift für Hals-Nasen-und-Ohrenheilkunde.*)

Having noticed the excellent recovery of middle-ear suppuration with normal mucosa after the instillation of 10 per cent. tincture of iodine through the perforation, the author tried the same method in chronic frontal sinusitis. A small incision and minimal hole in the bony wall was made just big enough to see clearly inside. The mucous membrane opposite the hole was removed and great care was taken not to disturb the rest of the lining. The cavity was irrigated with normal saline, or gently sucked or mopped out. When the cavity appeared to be clean a 10 per cent. tincture of iodine was run in and the head moved in all directions so that the application reached all corners of the cavity. The excess was removed, a rubber stopper with double boring was inserted in the hole and bound on with a gauze dressing.

The wound was irrigated daily through one of the holes with normal saline. The mucosa was found to have become healthy and in a series of cases it was possible to close the wound from a week to a month after operation. Many of the cases had had suppuration for a number of years. The moment the swelling and inflammation



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of the lining of the mucosa subsided the passage of the nose re-opened. This was the signal for the closure of the wound.

F. C. W. CAPPS.

## MISCELLANEOUS

*Blinking in Otogenic Peripheral Facial Paralysis.* P. H. S. VAN GILSE. (Leyden.) (*Acta Oto-Laryngologica*, 1936, xxiv, 1.)

Recent researches have shown that blinking differs from all other movements of the eyelids, especially by the rapid horizontal movement of the edge of the lower eyelid towards the nose.

During the act of blinking the eye does not show Bell's phenomenon. In cases of subtotal Bell's palsy blinking is the last movement to disappear and the first to return on recovery. There is always a chance of recovery when slight contractions of the lower lid are present and whilst these remain the eyeball remains stationary and Bell's phenomenon is not seen though, as is well known in complete paralysis, this phenomenon is always present, together with a relaxation of the levator which leads to a slight narrowing of the palpebral fissure. The cinematograph film is very useful for studying these phenomena and, by its use, slight contractions of the lower lid can be observed more easily.

H. V. FORSTER.

*The Histo-pathology of the Trachea in Tuberculous subjects.* DR. G. G. BETTIN. (*Archivii Italiani di Laryngologia*, May, 1936.)

A great deal has been and is being written about tuberculosis of the larynx but comparatively little interest is taken in the condition of the trachea in tuberculosis. Dr. Bettin has carried out a series of investigations on the trachea, including the cartilage and submucous layers in cases of phthisis without demonstrable lesions in the upper air passages.

He quotes Professor Caliceti as having carried out a research on fifteen cases where there was tuberculosis of the larynx. In five of these there was a definite tuberculous lesion in the trachea, in seven there were simple inflammatory lesions, and in the remaining three there were no changes.

In Dr. Bettin's series of fourteen cases there was no macroscopical lesion in either larynx or trachea. In five of them he found inflammatory areas with much round-celled infiltration and plasma cells, which involved the submucosa, perichondrium and cartilage, but in none of them were there any of the characteristics of tuberculosis. In a further six cases there were slight catarrhal changes and in three no changes at all.



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It is suggested that the inflammatory changes seen were caused by the irritation from the infected sputum passing upwards through the trachea. It is possible that such damaged areas may be more easily infected by tuberculosis but there is no evidence of this occurring.

F. C. ORMEROD.

*Some remarks on the Treatment of Phlegmons of Dental Origin.* G. GAMBRELIN (Brussels). (*Les Annales d'Oto-Laryngologie*, November, 1936.)

Two cases are described in some detail where the treatment by other surgeons is criticized and is made responsible for the protracted nature of the recovery. The main points of this criticism are, first, the delay in the removal of the offending tooth. Secondly, the too hasty incision of the gum, at a moment when pus had not yet formed. Thirdly, the mistake of curetting the bony cavity during the acute stage, which led to an osteomyelitis of the jaw. Stress is also laid on the good effect of early inoculation with the polyvalent serum of Delbet.

M. VLASTO.

*Masked Sinusitis as a cause of Obscure Fever.* A. R. SOHVAL and M. L. SOM. (*Archives of Otolaryngology*, XXV, 1, January, 1937.)

"Fever of unknown origin" has been repeatedly discussed in medical literature. In the investigation of such cases the paranasal accessory sinuses should be carefully examined. Although the nine cases reported in this paper lacked definite symptoms pointing to sinusitis, headache was present in all but one. The sinusitis was "masked" by the absence of localizing symptoms and by the presence of some misleading constitutional manifestation. Some of the nine cases which are described in detail may be summarized as follows:

CASE I.—Woman, aged 20; intermittent fever for three years. Slight supraorbital headache. Repeated physical examination negative. Eventually pus was observed in the left middle meatus of the nose. Puncture lavage revealed pus in each maxillary sinus. Cured by intranasal antrostomy.

CASE II.—Woman, aged 26. Fever, vague aches and pains, enlargement of cervical glands and of spleen. Blood examination negative on several occasions. Left maxillary sinusitis then discovered: cure following lavage.



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CASE V.—Girl, aged 17. Fever, ranging to 103° F. for four weeks. Physical examinations negative. Lavage of right antrum, thick pus found. Recovery followed irrigation.

CASE VIII.—Woman, aged 27. Frontal headache for ten years: intermittent fever. Diagnostic lavage of sinuses: pus in both antra and left sphenoidal sinus.

All patients in the series were in the early decades of life. The duration of the fever varied from one week to two years. Numerous diagnoses had been considered before the sinuses were suspected. The presence of an enlarged spleen in four cases led to a wrong diagnosis. The writers consider that X-ray examination is often misleading, irrigation being the only satisfactory test for sinus infection.

In the majority of cases lavage of the affected sinus or sinuses was followed by cure. Ethmoiditis responded to conservative treatment.

DOUGLAS GUTHRIE.



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