ABSTRACTS

EAR

Comparative studies on the histology of otosclerosis. A. GREIFENSTEIN. (*Arch. Ohr-, u.s.w., Heilk.*, 1935, CXXXIX., 14-99.)

In the introduction the author describes a new development of microscopic technique when sections are examined with polarized light. A special red screen is interposed which enables one to discover bundles of fibrils even if they are very feebly developed, e.g. in young otosclerotic bone. Bundles of fibrils appear blue or yellow, according to the level which they occupy in the sections.

The main matter of this lengthy article, which is fully illustrated with excellent microphotographs, is subdivided into several parts. The serial sections of temporal bones described in Part I were obtained from a man, aged 41, who underwent an operation for right-sided acustic tumour. No tumour was found in the internal auditory meatus, and the patient died twenty-seven days after operation. At the *post mortem* examination a glioma of the cerebellum was found. The left labyrinth showed several foci of otosclerosis in which all the various stages of development were present. By his microscopic technique the author was able to prove that the blue-staining young otosclerotic bone always contains bundles of fibrils, and that one cannot admit the description of a precollagen substance free from fibrils (Schaffer). Greifenstein believes that the otosclerotic focus represents a new bone formation after previous complete absorption of the bone of the labyrinth capsule in the particular area. The pathological process is not a form of degeneration or alteration of the bone of the capsule.

Part II: *Regeneration of bone and otosclerosis.* As the otosclerotic bone is newly-formed bone, it seemed appropriate to study its histology in relation to newly-formed bone in other parts of the body, e.g. in callus formation after fractures. Speaking generally, the author found no resemblance between the fresh focus of otosclerosis and young callus after fractures of long bones. The former stains blue (hæmatoxylin-eosin), the latter stains red and therefore contains many more fibrils. Further, a study was made of bone regeneration after trephining the skull, as illustrated in the right temporal bone of the above case. Bone specimens were obtained from the free margin of the diploë at the edge of the mastoid

opening on the third, ninth and twenty-seventh days after operation. In these sections the newly-formed bone closely resembled otosclerotic bone, e.g. blue-stain, "sieve-like" appearance.

In the sections from the specimen in which the cochlea had been opened at operation, the regenerative processes in the labyrinthine capsule could be studied. In one area a focus of otosclerosis had been cut across by the chisel; callus formation was particularly active in this region, and the transition between otosclerosis and callus is clearly shown in many of the illustrations. In other areas the reaction of otosclerotic bone to trauma was studied. Following an injury, the blue-staining otosclerotic bone containing few fibrils becomes transformed into reddish-staining bone with many fibrils. The pathological change is the same as that which takes place gradually when a young focus of otosclerosis becomes transformed into an older focus.

In Part III the author discusses the relation between otosclerosis and other forms of bony tumours. An osteophyte of an inflammatory origin, obtained from the frontal sinus of a patient, showed typical lamellar structure. Exostoses of the external auditory meatus showed no network structure comparable to otosclerosis. More resemblance was found in some osteomata. Many of the points raised by the author are difficult to follow unless one has made a special study of pathological conditions of bone. It is not particularly clear what conclusion Dr. Greifenstein wishes to draw in this part of the article.

In the last chapter there is a detailed discussion of the "spontaneous fissures" which figure so largely in the ætiology of otosclerosis according to Mayer's theory. The microphotographs in this part are especially interesting, as they show many different types of fissure in various stages of healing. The author believes that many of the fissures in the labyrinth capsule are artefacts. On the other hand, there are some in which it can be proved beyond doubt that they must have arisen during life. Wide fissures of traumatic origin heal readily by callus formation. This is shown in one of the illustrations in which a fissure penetrating as far as the labyrinth capsule had been made at operation. It is in the small slit-like fissures that there is comparatively little tendency to healing.

The histological study embodied in the present article seems to show that otosclerosis does not represent an absolutely unique form of bone change. Very similar microscopic appearances are found in certain types of bone regeneration and in developing osteomata (*osteodystrophia fibrosa*). As regards the ætiology of otosclerosis, the theory of O. Mayer finds a good deal of support.

J. A. KEEN.

Ear

The morphological connection between the subarachnoid space and labyrinth. L. N. JAMPOLSKY. (*Mschr. für Ohrenheilk.*, January, 1934.)

By preliminary experiments on cats and dogs after death, the author discovered that with a pressure of some 20 to 50 c.cm. of water, Indian ink injected into the caudal portion of the subarachnoid space was deposited in all cases in the labyrinth. He also found that the route for the deposit was *viâ* the acqueductus cochlea and the perineural space of the eighth nerve. Subsequent sections showed deposits in the scala tympani and the scala vestibuli throughout all the coils of the cochlea, and in the perilymphatic space of both the vestibule and the semicircular canals. On the other hand, the endolymphatic space was unaffected.

As this investigation was confined to experiments upon the dead animal, and it was suggested that perhaps similar occurrences would not obtain during life, ten similar experiments were carried out on living dogs and cats in the following manner :—

After anæsthesia by chloroform, ether and morphia, a suboccipital puncture was made in the usual way, 10 c.cm. of cerebrospinal fluid being previously removed in the case of the dog, and 2 c.cm. in the case of the cat. (In order to avoid a rise of pressure in the subsequent injection.)

The injection was then at once made of a sterilized dialysed solution of Indian ink diluted 1 to 4, as the usual commercial Indian ink had been found to cause convulsions, whilst with this particular preparation, no adverse effects of any description occurred.

Later, after some one to three weeks, the animal was killed and sections made of the inner ear. On examination of these sections later it was shown that, as in the case of experiments on the cadaver, an anatomical association could be demonstrated between the labyrinth and the subarachnoid space, as shown by the deposit of the granules of Indian ink therein, and further that the route of this communication was *viâ* the aqueduct of the cochlea and the perineural space of the eighth nerve.

There was one main difference, however, between the two experiments. That is to say, whereas the ink was deposited throughout the whole perilymphatic space in the dead animal, in the living animal it was found only in the immediate neighbourhood of the aqueduct and in the scala tympani of the basal coil.

The author discusses the various points which arise in connection with these investigations and summarizes his views in the following main conclusions :

The subarachnoid space communicates in two ways with the labyrinth—the aqueduct of the cochlea and perineural space.

The endolymphatic space is in no way connected with the perilymphatic space.

Abstracts

Circulation of the fluid in the perilymphatic space is very sluggish.

The perilymphatic space is not only connected with the subarachnoid space *viâ* the aqueduct of the cochlea but also has some slight communication with the adjacent lymphatic spaces of the ear.

ALEX. R. TWEEDIE.

Experiences in otogenic brain abscesses. Y. MEURMAN, Helsingfors. (*Acta Oto-Laryngologica*, xx., 3-4.)

The material covers fifty-six patients collected between the years 1901 and 1932. There were thirty-one cases of abscess in the cerebrum (Group 1), and twenty-four in the cerebellum (Group 2), one patient had both.

The writer personally attended fifteen patients of whom eight belonged to Group 1 and seven to Group 2.

Acute middle-ear suppuration caused twice as many cerebral as cerebellar abscesses. In chronic disease the groups are about equal.

Discussing symptoms: there is very little difference in the two groups concerning the presence of papillœdema. In the first group the pulse rate was low in 48%, in the second in 28%. Low temperature supposed to be pathognomonic of brain abscess was rarely found, but on the contrary a slight rise was noticed.

Spontaneous nystagmus was found not to be a necessary symptom of an affection of the posterior fossa. Loculated brain abscess was rare, only three of this kind being encountered.

In Group 1, affecting the cerebrum, the dura was found to be macroscopically intact as a rule, but this was not so in Group 2, the cerebellar cases.

As regards the mechanism of development of a cerebellar abscess, the original focus was believed to be from the inner ear in a third of the cases and, in an equal number, from the cell system of the temporal bone.

As regards the pressure of the cerebrospinal fluid there was no difference in the two groups.

The cause of death in Group 1 was believed to be meningitis in 50%, and in 25% high intracranial pressure. In Group 2, however, the reverse was the case.

Two deaths followed lumbar puncture in Group 2, but the writer thinks that the operation may be safely carried out even in this group so long as the fluid is allowed to flow slowly and if not more than 2 c.cm. are drawn off.

With regard to the cure of patients with brain abscess, the figures were 29% in Group 1, and 29·2% in Group 2, but in recent cases treated more uniformly and by the writer himself results were better.

Exploration by a thick cannula through the dura and using a syringe is advocated. The usual practice is to drain the abscess through the original operation cavity but the use of a separate osteoplastic flap to explore for an abscess not found by the usual route has proved successful in one case.

In the more recent cases the method of drainage advocated by Lemaitre has been employed, using soft rubber filiform tubes and, instead of changing them and using thick ones to enlarge the opening, the practice has been to add to the number of small tubes.

H. V. FORSTER.

Demonstration of the application of artificial tympanic membranes according to new principles. VILHELM NASIELL, Stockholm. (*Acta Oto-Laryngologica*, XX., 3-4.)

The writer recalls the disadvantages of the well-known so-called "artificial tympanic membrane", which consists of a pledget of cotton wool saturated with glycerine or paraffin. These disadvantages account for it being rarely used.

The idea of repairing a defective tympanic membrane was suggested in 1640 by Marcus Banzer. Of the many experiments that have been carried out to achieve this objective, the use of a skin graft by Berthold in 1818 and the more recent idea of a pedicle graft from the auditory canal are mentioned.

The author's first attempt in the direction of a fixed non-irritant prosthesis consisted of a pellet of absorbent cotton wool infiltrated with boracic acid-gelatin and applied over a medium sized perforation of the tympanic membrane. The poor hearing returned to normal. After four months the prosthesis was still in place, and when removed there was no sign of irritation over the drumhead or within the tympanum. The author states that he has been able to prove hundreds of times during the last six years that the epidermis of the healed tympanic membrane and auditory canal tolerates a sterilized solution of 10% gelatin and 1% boracic acid without the patient or doctor being able to detect any reaction. This is the adhesive substance by which he fixes the prosthesis which itself is cut from a sheet of cellophane, and then disinfected for two hours in aniodol (an antiseptic used with success in the French Army during the Great War). After disinfection it is immersed in 4% boracic acid solution in order to keep it soft and sterile and to retain its transparency.

The prosthesis is applied whilst making use of a magnifying glass, and a small tube under negative pressure from a water suction apparatus is used as a carrier. The author states that the toleration of the tympanic membrane and auditory canal to the adhesive substance is remarkably constant when the prosthesis application is carried out in suitable cases with a dry ear. He has observed

this in cases in which the prosthesis has been changed twenty times in six years.

After applying the artificial drumhead it is supported by suitable gauze packing, and its adherence is further ensured by driving against it from within any loose parts of the tympanic membrane, using a Eustachian catheter to inflate the middle ear.

Benefits derived from the prosthesis.

(1) In perforations of the tympanic membrane the tympanic cavity is shut off from the auditory canal. Some patients obtain subjective relief and, in others, head noises are reduced. It improves hearing in most cases, and even Politzerization may be carried out if due care is exercised. In cases of Eustachian obstruction ventilation may be obtained through a tiny hole pricked in the firmly dried prosthesis. In some cases the perforation heals under the application.

(2) In atrophied drumheads and loose scars, hearing is improved and the flaccid drumhead is supported.

Disadvantages.—In two out of eighty-five cases only, the perforation had increased in size. In two cases there was some discharge. The technique of applying an artificial drumhead needs patience and time and is not a manœuvre for the hurried conditions of the out-patient department.

H. V. FORSTER.

Experimental research on the function of the Eustachian tube. GUNNAR HOLMGREN, Stockholm. (*Acta Oto-Laryngologica*, XX., 3-4.)

It is generally admitted that the Eustachian tube serves to maintain equilibrium between the pressure of the air in the middle ear and in the nasopharynx. Politzer observed that during the act of swallowing this equalization takes place, though in certain individuals it happens during the act of respiration and the permeability of the tube varies with different individuals.

Hammerschlag believed that he had been able to show how the tube was always open to the current of respired air.

With regard to the function of the cilia of the cells of the tubal lining, Hammerschlag believed them to have the function of opposing the entrance of bacteria and particles and their passage up the tube, and not that they serve the purpose of clearing the secretions from the middle ear.

The writer calls attention to the observations of Blegvad, who has doubts about lasting Eustachian occlusion, and who believes that retained catarrhal secretion in the middle ear is not a transudate dependent on Eustachian occlusion, but an exudate from catarrh of the mucosa of the tympanum. He also describes how Beck endeavoured to secure closure of the Eustachian tube in the dog.

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Holmgren describes his experiments in anæsthetized dogs in which he was able to secure experimental closure of the pharyngeal ends of the Eustachian tubes and, further, to carry out manometric observations on the intra-tympanic pressure. As it was difficult to secure hermetically a needle passed through the drumhead, he succeeded in doing so after passing one through the bulla ossea. He also experimented upon the action of the cilia in moving onwards Zeroform granules inserted into the tympanum, and observed them in a short space of time at the pharyngeal orifices. His conclusions are as follows :—

(1) When the Eustachian tube has been ligatured in the dog, it is possible, using a manometer, to observe after a certain time a sustained diminution of the air pressure in the middle ear, and in this case the duration of the observation was prolonged for an hour and a half.

(2) In the experimental occlusion of the tube one could notice, after several days, either a retraction of the tympanic membrane or a seromucous collection within the middle-ear cavity.

(3) The secretion observed within the middle ear seemed to depend partially at least, and perhaps entirely, on the retention of glandular secretions.

(4) In the dogs anæsthetized by "Numal" the ciliated epithelium of the Eustachian tube carried grains of Zeroform proceeding in a direction from the tympanic cavity to the nasopharynx.

H. V. FORSTER.

What can Röntgen examination contribute at present in acute and chronic otitis? G. DOHLMAN, Lund. (*Acta Oto-Laryngologica*, XX., 3-4.)

The writer considers that Röntgenological examination of the temporal bone demands more of the Röntgenologist than do most fields of X-ray diagnosis. He pays tribute to the difficult technique developed by Runstrom.

During the first week of an acute otitis there is little value in these examinations. The demonstration by X-rays of a blurring of the cell system may have no more significance as to progress or operative indications than the pain behind the ear in the first days of the illness. In the third or fourth week, however, it is of more value as a support for treatment.

In cases of prolonged otitis media, such as *streptococcus mucosus* infection, X-ray examination of the mastoid cell system may often show destruction out of keeping with other signs of the disease.

We do want to know, however, in cases of acute otitis the extent of development of the cell system, for example into the zygoma or into the petrous apex or behind the lateral sinus. Röntgen

examination does not help much to inform us as to the presence or development of complications.

In chronic otitis the matter is different, though the writer does not consider cases of chronic otitis with attic perforation suitable for X-ray examination. The cell system is poorly developed in such cases. It will be useful, however, in cases of perforation of the posterior superior wall of the deep meatus to show whether a cholesteatoma of some size has developed here, and therefore whether conservative treatment will be of any use.

In cases of central perforation in the drumhead, X-rays will be of use to show that there are no cells in a given mastoid process, when ossiculectomy or atticotomy will suffice; but if a well developed cell system with dissolution due to a chronic mastoiditis is shown, then we have a type of case suitable for mastoid operation.

H. V. FORSTER.

Observations on the pathology and clinical course of otogenous sinusphlebitis. H. E. FRÜHWALD. (*Acta Oto-Laryngologica*, xxi., 4.)

The author's enquiry has been directed especially to the "age" of the middle-ear affection in cases of otogenous sinusphlebitis. By this he means, in reference to acute otitis, the interval between the first symptoms of the otitis, and those of the sinus involvement; and, in chronic otitis, the period between the beginning of the last acute exacerbation and the onset of the intracranial complication; since it is generally agreed that in chronic otitis media an intracranial complication is the result of an acute exacerbation.

His conclusions are that in *acute* suppurative otitis media leading to sinusphlebitis and thrombosis:—

(1) The complication arises chiefly in the interval between the end of the second and the middle of the fourth week of disease.

(2) The mastoid is usually of the pneumatic type.

(3) The changes in the sinus wall at the critical period consist principally in a slight discoloration and more or less marked coating with inflammatory products.

(4) In most cases the thrombus, until the beginning of the fourth week, is solid, but in highly virulent infections rapidly breaks down.

(5) About the end of the second week bacteria can be demonstrated in the thrombus, which is therefore already infected.

(6) Metastases appear only in the later stages.

In sinusphlebitis associated with *chronic* suppurative otitis media:—

(1) The sinus affection makes its appearance in the first few days of the acute exacerbation.

(2) In cases without cholesteatoma the mastoid is usually of the pneumatic type.

(3) Marked changes in the sinus wall, thrombosis, and infection of the clot, occur as early as the first week, the variety of thrombus present depending on the virulence of the infecting organism.

(4) Metastases occur in the course of the second week.

THOMAS GUTHRIE.

Injuries caused by sound, and the function of the saccule. W. UNDRITZ and R. SASSOSSOW. (*Acta Oto-Laryngologica*, xxi., 4.)

Using a quartz plate made to vibrate by a high frequency alternating current, the authors exposed a number of animals to short-wave tones of high intensity both within the range of hearing and also above it (" ultraschallwelle ").

In the first series of experiments white mice were exposed for thirty minutes daily during a period of seven days to intense (" ultra-sound ") waves of 40,000 Herz. Immediately after the end of the experiment the animals were decapitated and their labyrinths prepared for microscopical examination.

In the second series frogs and small fish were subjected to similar vibrations in a water-filled vessel.

In the third series of experiments mice were exposed to tones of excessive intensity *within the range of hearing*, by using quartz oscillators of 2,500 Herz. In previous experiments of this kind use has generally been made of detonations or of whistles, of which neither gives pure tones, while the former produce gross mechanical injuries, such as rupture of the tympanic membrane.

The authors' experiments showed that very loud tones, whether within or above the range of hearing, produce the appearances of mechanical injury to inner-ear structures, such as hæmorrhage into the labyrinth, displacement and changes in form of the cells of the organ of Corti, and separation of the otolith membrane of the sacculus.

It is of particular interest that the sense organ of the sacculus should be affected, since this suggests that its function is at least closely related to tone perception.

The paper is illustrated by several microphotographs showing damage to the organ of Corti and the macula of the sacculus.

THOMAS GUTHRIE.

Forced drainage for treatment of meningitis secondary to ear and sinus infections. LAWRENCE S. KUBIE. (*Annals of O.R.L.*, 1934, xliii., 692.)

Forced drainage, as a method of treating meningitis, is based on the experimental demonstration by Weed in 1925, that the volume of cerebrospinal fluid produced could be altered by variations in the osmotic pressure of the blood.

Abstracts

The rationale of the method is, briefly :—

(i.) Under normal circumstances practically all the cerebrospinal fluid is formed at the choroid plexus. Some fluid is produced at the arterial end of the cerebral capillaries but is almost at once re-absorbed and does not reach the subarachnoid space.

(ii.) When the pressure is reduced by drainage and kept there, the re-absorption is lessened, and this fluid from the capillaries tracks along the perivascular spaces to the subarachnoid space.

(iii.) The rate of formation of this capillary transudate can be remarkably increased by lowering the osmotic pressure of the blood, and at the same time draining the subarachnoid space, and this without increase of the cerebral pressure, or production of cerebral œdema.

(iv.) In inflammatory conditions of the central nervous system it has been shown that the products of inflammation are actually carried along with the fluid in forced drainage.

(v.) Experimentally in animals the method is harmless.

(vi.) There is presumptive evidence, without final proof, that the procedure carries over immune bodies from the blood to the cerebrospinal fluid.

(vii.) The best method of reducing osmotic pressure of the blood is the intravenous injection of hypotonic saline, containing sufficient salt to prevent hæmolysis. Given slowly, such injections do not overload the circulation.

(viii.) Forced drainage differs from simple withdrawal of fluid in that :—

(*a*) Simple drainage allows the meninges to collapse on the central axis of the central nervous system, thus obstructing the natural pathway of the cerebrospinal fluid.

(*b*) Simple drainage evacuates the subarachnoid space and, to some extent, the ventricles.

(*c*) Forced drainage activates the perivascular drainage.

The method has not been long enough in use for one to say much about the indications and contraindications, but it is probably best avoided in all cases with pulmonary, cardiac, or renal disease, bacteræmia, or cerebral abscess.

The question as to whether the focus of infection or the meningitis should be tackled first is problematical, but in labyrinthitis it is probably best to carry out forced drainage first. Then, if the meningitis shows signs of improving, operate on the labyrinth, continuing meanwhile periodical forced drainage.

The technique is briefly :—

(*a*) Drain off the cerebrospinal fluid by lumbar puncture as rapidly as possible without causing discomfort to the patient.

(*b*) Commence the intravenous injection of hypotonic saline (0·45%) using one to three litres in the course of one to three hours.

Should the initial drainage cause headache the injection should be commenced at once, otherwise not until simple drainage has ceased.

(*c*) Drainage may be repeated daily or oftener, or even continued steadily for a day or more.

Case reports of ten cases are given, with five deaths and five recoveries. In one of the cases which died there was apparent recovery from the meningitis but death from septicæmia, and a second death was from cerebellar abscess. In one of the cases which recovered the author states that he was not satisfied that the case was one of purulent meningitis and not an epidural abscess, but has included it in the series.

E. J. GILROY GLASS.

(N.B.—An earlier report of this method is abstracted in this *Journal*, xlviii., 422, 1933.)

NOSE AND ACCESSORY SINUSES

Effects of ionization on the mucosa of frontal sinuses of dogs. BERNARD J. MCMAHON. (*Annals of O.R.L.*, 1934, xliii., 643.)

Ionization experiments on the frontal sinuses of six dogs are described. In each case the mucosa was examined histologically, and the following changes are recorded :—

(i.) Definite destructive changes were brought about in the mucosa by the ionization of zinc sulphate solution. These changes consisted of ballooning, fragmentation and complete destruction of the surface epithelium, a marked œdema of the subepithelial tissues and an extravasation of free red blood cells into these tissues from greatly dilated and ruptured capillaries.

(ii.) The specific response of these tissues to the ionization of silver colloids is a polymorphonuclear leucocytosis.

(iii.) The general response of the mucosa of the frontal sinuses of dogs to a galvanic current is an engorgement of the capillaries of the subepithelial tissues.

E. J. GILROY GLASS.

The nasal accessory sinuses and the mechanism of respiration. Clinical and experimental researches on the physiological significance of the sinuses. G. KEREKES. (*Acta Oto-Laryngologica*, xxi., 4.)

In order to investigate the ventilation of the maxillary antrum the author made, during an influenza epidemic, a number of manometric observations on the air pressure in antra which he had punctured for therapeutic purposes. He also carried out similar experiments on the trephined frontal sinuses of dogs. The pressure changes were graphically recorded and several of the resulting curves are shown in this paper.

He was able in this way to prove that, under normal conditions, there is always a variation of pressure corresponding to the respiratory current in the accessory sinuses. This variation of pressure is absent in disease of the antrum, and re-appears when healing takes place. If, in the absence of disease of the antrum itself, its opening is obstructed, headache may result, and this is relieved on re-establishment of the respiratory variations of air pressure. In some cases the obstruction may be incomplete and valve-like, so that a persistent negative pressure develops. Thus the changes of air pressure are of clinical significance and their measurement may be of value in regard to the pathogenesis, diagnosis, prognosis and treatment of antral disease and also of headache of nasal origin.

It is further suggested that the varying pressure in the accessory sinuses exerts a reflex control on the respiratory mechanism, and that this should be regarded as an important function of the sinuses.

THOMAS GUTHRIE.

Some considerations concerning the pressure obtaining within the frontal sinus whether due to aseptic stenosis or due to inflammation. FOLKE SODERBERG, Boras. (*Acta Oto-Laryngologica*, XX., 3-4.)

The pressure in a sinus is known to diminish slightly with inspiration and to be raised a little during expiration, but for the pressure to vary to a greater extent, complete or partial obstruction between the sinus and the nasal cavity must take place.

The author's research into this problem is concerned with patients suffering from sinusitis and with his experimental observations on obstruction of the frontal sinus in the cat. He recalls the theoretical considerations of Killian, Sluder and others concerning the production of reduced pressure in the frontal sinus and the formation of vacuum headache, but there are authors who refuse to admit this state of affairs, such as Bourget who remarks that patients with nasal polypi would be expected to suffer from headaches to a greater extent than they do.

Referring to the opinions of various observers who have worked on the question of gaseous exchange in the body he calls attention to the part played by carbonic acid and to its solubility in water.

In the case of an aseptic stenosis of the entrances to the frontal sinus the pressure will become equal to the gaseous blood pressure, which is 10% below atmospheric, and therefore a negative pressure is easily understood. In cases of inflammation the problem is more difficult; gaseous equilibrium takes place under more difficult conditions, and in the presence of secretion the final result is probably a raised pressure.

In several cases of frontal sinusitis, comprising chronic disease, exacerbation of chronic disease and, in primary acute conditions, the

mucous membrane of the sinus was uncovered by carefully removing bone, when stenosis of the nasal duct was proved and also the presence of increased pressure within the sinus.

In studying conditions under aseptic obturation of the nasal duct, anæsthetized cats were used in the experiments. A fine cannula connected the interior of the exposed sinus with a manometer containing xylol and, after noting the effect of respiratory movements on the manometer reading, the ethmoidal region was exposed by removing part of the nasal bone and the entrance to the sinus was closed with a plug of wax.

Then after twenty to thirty minutes the pressure in the sinus was noted to fall and to reach the maximum fall at the end of about two hours. No secretion was observed to collect in the sinus in these cases. He also observed the result after injecting a solution of iodine into a sinus which showed such a negative pressure. The pressure then rose and secretion appeared in the sinus.

These experiments therefore suggest that in an aseptically obstructed sinus a negative pressure results, and when inflammation appears in the presence of obstruction a positive pressure develops.

H. V. FORSTER.

Chronic maxillary sinusitis (with ethmoidal sinusitis) in children from seven to twelve years. V. THORKILDSEN, Skien. (*Acta Oto-Laryngologica*, xx., 3-4.)

The great frequency of maxillary (and ethmoidal) sinusitis in children having attracted the writer's attention, he has systematically studied from this point of view, the children attending the Oto-laryngological Polyclinic.

The cases of sinusitis discovered were in children aged from seven to twelve years who were examined during the period between August, 1930 and May, 1931. (A control investigation took place about a year later.)

The examinations were carried out on 204 children of the age stated above, who were suffering from various diseases. Nasal obstruction and symptoms of rhinitis (from various causes) were found in 128 of them. Amongst the 204 children of the whole series there were sixteen cases of chronic maxillary (and ethmoidal) sinusitis, a condition easily missed if not specially looked for.

The symptoms are the same as in chronic rhinitis, though more often noticed unilaterally and there are in addition several variable symptoms, slight fœtor, headaches, and a tendency to acute febrile attacks. The usual methods of exploration serve to distinguish the ordinary symptoms of sinusitis but, more especially in children rather than in adults, proof puncture is the only means of the diagnosis ; further, because of asymmetry or some other factor,

radiography in particular may suggest the diagnosis of sinusitis in cases in which this affection is absent.

The results of the blood sedimentation test and of the investigation of the bacterial flora seem to indicate that sinusitis is not ordinarily a true bacterial malady, but suggest that the secretion of a sinus deserves to be looked upon as a culture medium propitious for bacteria which, though not very pathogenic, nevertheless set up an inflammatory state of the mucosa.

Treatment by conservative methods such as lavage (though not too frequently carried out), vaccines, attention to general hygiene, etc., very often result in a cure.

If adenoid vegetations are present they are removed. A radical operation for sinusitis may be necessary in some cases.

H. V. FORSTER.

LARYNX AND TRACHEA

On the spontaneous re-opening of a long-healed tracheotomy wound. DR. SATORU YAMAMOTO, Kagoshima. (*Oto-Rhino-Laryngologia*, viii., 3, 246.)

The patient, who was four years old, was tracheotomized on account of laryngeal diphtheria, and, because of extreme weakness, the healing was very slow and was complete only after fifty days. Three months later he suffered from pneumonia, in the course of which the tracheotomy wound opened on account of the severe attacks of coughing. The wound was infected by the sputum and underwent increased and continual enlargement. The patient died of pneumonia. The writer asks how the wound should be treated in such cases.

JAMES DUNDAS-GRANT.

Papillomata of the larynx in children. VAN DEN WILDENBURG. (*Les Annales d'Oto-Laryngologie*, December, 1934.)

Laryngeal papillomata are far more frequent in children than in adults and in the latter they seldom interfere with the act of breathing, merely causing a dysphonia. The fact that tracheal papillomata occur in cases in which the patient has been tracheotomized over a considerable time may be regarded as evidence that their presence may be due to inflammatory irritation, otherwise little is known as to their pathogenesis.

There appear to be two forms of papillomata: those which cure either spontaneously or as the result of slight surgical treatment, and those which respond to no form of treatment and constantly recur after removal. The treatment of these growths is discussed, and emphasis is laid on the view expressed by Chevalier Jackson that

the best form of treatment is peroral removal of the growths without encroachment on the healthy subjacent mucosa. Thyrotomy is emphatically condemned. Treatment by fulguration and irradiation has proved useless. Indeed, the author's experience with radium has been unsatisfactory, as this has led in some cases to necrosis of the cartilage and laryngeal stenosis. The author concludes by briefly referring to the far rarer and more dangerous condition of tracheal papillomata.

M. VLASTO.

TONSIL AND PHARYNX

Indications for tonsillectomy viewed from the point of view of Oto-Laryngology and internal medicine. G. DOHLMAN, Lund. (*Acta Oto-Laryngologica*, XX., 3-4.)

The internist sees the patient during his illness and is in a position to observe the development of any complications as they arise, but the otologist who sees the patient in the quiescent stage only hears a description of the case history, and this often from the patient himself.

The conception of focal infection has enlarged the field of indications for operations and a certain confusion exists as to the desirability of doing them.

When we carry out tonsillectomy because of repeated acute attacks or for complications in the joints, heart, kidneys, etc., which have followed these attacks of acute tonsillitis, we have definite theoretical and practical indications for interference ; and when we examine such tonsils microscopically we find certain signs suggestive of inflammatory change, but we can hardly say what anatomico-pathological state will justify a diagnosis of chronic tonsillitis or indicate that localized complications or a general toxic absorption would take place.

As there is, on microscopical examination, nothing to distinguish with certainty the tonsil of a healthy person from that of a patient subject to repeated acute attacks accompanied by repeated attacks of polyarthritis or any other complication, we are forced to draw the following conclusions :—

(1) It is useless to rely on macroscopical signs to judge the normal or pathological tonsil when the microscope cannot decide, and when deciding on operative indications one should neglect the so-called " clinical signs " of a chronic tonsillitis—plugs, hyperplasia, etc., redness of pillars, gland troubles. These only prove past troubles or a more or less accidental irritative condition.

The writer believes, however, that we ought not to refuse to do a tonsillectomy in cases in which the history indicates clearly a relation between repeated tonsillar affections and their complications,

even though we do not discover plugs of detritus in the crypts or some other equivalent sign, because we should then waste time looking for evidence by inspection alone.

(2) The second conclusion is a physiological one which Hellman has established, that there is a battle going on in the tonsils between noxious influences and a defence mechanism. Chronic tonsillitis is a normal state unknown only in those animals brought up in an environment free from bacteria.

Because of the indecisive frontier micro- and macroscopically which separates the normal from the abnormal tonsil this consideration has led to the erroneous supposition that all tonsils are unhealthy organs and ought to be removed. Another useless argument is that the same functions belong to all the other lymphoid tissue of the alimentary tract and we cannot remove it all by surgical methods.

A more legitimate conclusion would be that in the clinically diseased tonsil we have a mode of pathological reaction which is expressed by repeated acute attacks within the organ itself, and by a pathological permeability to bacteria and their toxins which can lead to a series of complications.

As this is the case it would be better to try and discover the cause of these modifications of tonsil reaction to bacteria which live in the mouth and tonsil tissue. These reactions may also depend on a local lesion of the tissues resulting from previous severe attacks of tonsillitis. In such cases we can expect a good result from tonsillectomy, but the alterations in question may also be a manifestation of lack of resistance of the organism in general, and then if we carry out a tonsillectomy the patient ceases to have anginas, but persists, nevertheless, in presenting just as often pharyngitis, rhinitis, bronchitis, etc. Both these categories of patients are no doubt well known to us all.

One could argue that it is not so much poor resistance on the part of the body as the vitability or virulence of the bacteria which are important factors, but if we consider that the sole object of bacteria is not to attack men or animals but to behave according to the nutritive medium on which they find themselves implanted we begin to appreciate the importance of the buccal secretions and the reactionary capacity of the tonsils to bacteria.

In some experiments which the writer carried out he noted, for example, how Gram-positive organisms disappeared from the bacterial flora of the mouth cavity after the administration of a diet free from carbohydrates.

When certain favourable results follow the operation of tonsil removal in arthritis or chronic septic conditions there are some factors which should not be lost sight of. Do the rest in bed and enforced starvation have in themselves a beneficial effect? We

have also to remember the presence of two bare operated areas in the throat from which a vaccination process may take place.

In conclusion, the writer considers that no otologist would refuse to remove the tonsil when, after a careful examination of the case, it had been decided that this organ was responsible as a source of infection for certain pathological lesions, but cases should not be submitted to him for operation on the slender pretext that certain diffuse symptoms originate from it.

The internist must develop a keen sense of responsibility and not propose a " hit or miss " policy or suggest tonsillectomy just because some other line of treatment has failed, neither should the argument be used that the operation is not a dangerous one. Such an argument would be of little use after a possible accident or fatality.

H. V. FORSTER.

Apoplexy of the uvula, with a personal contribution. MAURICE YOEL, Athens. (*Les Annales d'Oto-Laryngologie,* December, 1934.)

This condition, which is also termed " apoplexy of the soft palate ", has not yet been described in textbooks. This affection is rare and is of interest to the practitioner as well as to the specialist because it is a surgical emergency and strikes a patient who is in perfect health. The clinical history of the few cases that have been recorded is nearly always the same. Suddenly, often during sleep, the patient—perhaps after the act of hawking—feels a foreign body filling up the back of the throat which he is unable to expel. At the same time, there is marked dyspnœa and pain, and in addition there is often an alteration in the voice. There is no pyrexia and no trismus. Examination reveals a reddish violet discoloration and swelling of the uvula and soft palate, which contrasts with the usual normal pink colour of the pharynx and surrounding parts. In a few cases, the swelling extends to the ary-epiglottidean folds, obscuring the view of the vocal cords. The prognosis of these cases is always good. The hæmatoma is either absorbed spontaneously or it bursts, giving issue to a little blood. The whole of this little tragedy is enacted so rapidly that the surgeon seldom arrives in time to note more than a discoloration of the mucosa. The pathogenesis of the condition is not precisely known, but there appears to be some predisposition on the part of the individual as the same patient may suffer from more than one attack. The immediate cause of the trouble appears to be the bursting of a venule in the submucosa and may be compared to the similar condition that is seen in the vocal cord.

M. VLASTO.

Abstracts

Atrophic pharyngitis, especially in relation to internal secretion. DR. MAKATO MURAKAMI, Tokyo. (*Oto-Rhino-Laryngologia*, viii., 2, 121.)

Out of forty-two patients the female sex was immensely preponderating, especially at the menopause or after puberty. The writer distinguishes three groups: the genuine (primary), the secondary, and the mixed forms. In ten cases of the primary form, satisfactory results were produced by the injection of pituitary and ovarian preparations.

JAMES DUNDAS-GRANT.

Malignant tumours of the palatine tonsil. J. DUCUING and L. DUCUING, Toulouse. (*Les Annales d'Oto-Laryngologie*, January, 1935.)

This article deals only with primary carcinomata of the tonsil. It is introduced by a short historical sketch of the subject, followed by a brief description of the anatomy of the tonsil and its relations to neighbouring structures. The influence of age, sex, profession, alcohol, smoking and traumatism are noted. The neoplasms may belong to one of three groups: (*a*) epithelial, (*b*) vasculo-conjunctival (to which class belong the sarcomata and endotheliomata), (*c*) mixed tumours. The characteristics and frequency of these different forms of tumours are described. The author next proceeds to discuss the clinical aspect of the subject. The three cardinal initial symptoms common to all forms of tumours are (1) discomfort in the throat, (2) pain in the ear, (3) glandular enlargement. Each of these initial symptoms is examined in detail. At the Anti-cancerous Centre at Toulouse, invasion of the cervical lymphatics was the initial complaint in fifteen out of seventy-one cases. The symptomatology is further discussed during the later stages. The average time elapsing between the first symptom and the death of the patient is difficult to ascertain, but it may be said to vary between six and thirty months. Considerable space is devoted to the differential diagnosis of tonsillar enlargements associated or not with ulceration of the surface. The treatment of this condition is discussed in detail. The only forms of treatment which have been found to be useful are those commonly used in the surgery of cancers in general: surgical, high frequency, deep X-rays and radium—or a combination of these. Each of these methods is considered in detail. Of particular interest is a section which suggests the best line of treatment to be adopted according to the varying circumstances as they present themselves to the surgeon. For tumours belonging to the vasculo-conjunctival group, physico-therapy must be used to the exclusion of any other method. The epithelial tumours are considered under the following circumstances: (1) Where there is a local tumour without glandular metastases. (2) Where there is glandular involvement, but where

the glands are not fixed. (3) Where there is glandular fixation. (4) Where there is extensive metastatic dissemination. These various hypothetical considerations are made clearer by schematic illustrations. The statistics of various clinics are tabulated and there is a very complete bibliography.

M. VLASTO.

Tonsillectomy in the tuberculous: incidence and pathology of tuberculosis of the tonsil in adults. HORACE NEWHART, SUMNER S. COHEN and CHARLOTTE C. VAN WINKLE. (*Annals of O.R.L.*, 1934, xliii., 769.)

Tonsillectomy has been performed on 324 tuberculous patients, including 100 children, since 1919. One case only has shown an unfavourable clinical course after operation, whilst in general the improvement seen after tonsillectomy in non-tuberculous patients has been maintained.

The indications for operation are the same in the tuberculous as in the non-tuberculous; but hopelessly advanced cases, and those in whom the tuberculous process is in an acute phase are excluded. Prior to operation the patient is confined to bed for an indefinite period, during which he is kept under close observation.

The operation itself is performed under local anæsthesia in adults and under chloroform in children. Very great care is necessary to prevent any blood reaching the lung, and to control hæmorrhage.

After operation the patient remains in bed for at least four weeks during which observation is again close and diet regulated to give maximum nourishment.

Histological examination of the tonsils showed tuberculous lesions in 48%. In advanced cases this incidence rose to 57%, whilst in mild cases it was as low as 17%. It is also worthy of note that the incidence of tonsillar lesions was three times as great in patients with positive sputum as in those with negative sputum, indeed the authors hold that the infection is generally from the sputum and that infection by lymphatics or blood stream, if it does occur, must be rare.

E. J. GILROY GLASS.

Is there any ætiological relationship between a chronic tonsillitis and a coexistent acne vulgaris or a chronic eczema? A. GALTUNG, Oslo. (*Acta Oto-Laryngologica*, xx., 3-4.)

The writer began these investigations after being consulted by Dr. Inga Saeves in a case of chronic acne which had resisted all treatment and in which recovery took place after tonsillectomy. The acne first broke out after an attack of acute tonsillitis with high fever.

In the subsequent investigations tonsillectomies were done in twelve adults with chronic acne and in eight adults and in one child with chronic eczema. Both good and bad results were recorded. Good results are more likely to take place in those cases with a history of throat disease. Great care is taken in selecting the cases. For example, cases of acne in puberty in which recovery generally follows in due course are not chosen for operation. The condition must have been present for some years and have resisted the efforts at treatment of a skilled dermatologist.

In chronic eczema cases are chosen in which treatment in a skin department has been tried for several months and in which alimentary allergy has been excluded. Other foci of infection are also previously taken into consideration.

In brief, cases are selected in which a chronic tonsillitis was thought to be the only definite cause of the skin infection.

The case histories of several patients are described.

H. V. FORSTER.

Chronic hypertrophy of the lingual tonsil and its surgical treatment. A. PUTSCHKOWSKY. (*Acta Oto-Laryngologica*, xxi., 4.)

Of the four parts of Waldeyer's lymphatic ring the lingual tonsil has received least attention. And yet, according to Simanowsky, it is very frequently the seat of acute, and especially of chronic, inflammatory disease. He found, in fact, that it showed chronic hypertrophy in 21·9% of 973 patients attending his clinic. Previous acute attacks appear to play an important part, and age has less influence than in relation to the other tonsils.

The symptoms in chronic hypertrophy are very varied and consist of a sensation of pressure, foreign body, constriction of the throat, spasmodic dysphagia and cough.

In the milder cases treatment consists of applications of Mandl's paint, silver nitrate, trichloracetic acid or, preferably, puncture or linear incisions with the galvano-cautery point, repeated on two or three occasions under local anæsthesia.

When the enlargement is greater, removal may be carried out with one of the forms of tonsillotome or with Heymann's curved scissors.

In a few cases in which the enlargement is so great as to fill completely the space between the root of the tongue and the epiglottis and to cause disturbances of speech and swallowing, it is necessary to perform complete removal. This the author does by dissection under local anæsthesia by novocain-adrenalin injection. The operation is described in detail.

THOMAS GUTHRIE.

Œsophagus and Endoscopy

ŒSOPHAGUS AND ENDOSCOPY

Some remarks on the operative treatment of œsophageal diverticula. BORGE LARSEN, Copenhagen. (*Acta Oto-Laryngologica*, XX., 3-4.)

The writer refers to cases of so-called " pulsion diverticulum " (Zenker's) or, as Killian called the condition, " hypopharyngeal diverticulum ".

Eleven patients were treated, of which only three were women. Seven of the cases were operated upon, two of them twice. In addition to these eleven cases there were two doubtful cases in which an exploratory operation was performed. Of the total of thirteen cases, six have died and seven are alive over periods which range from three months to six years.

On the seven patients who came to operation, nine operations have been performed. Five diverticulopexies, two extirpations according to Goldmann, one extirpation (in one stage) and one unsatisfactory operation.

X-ray diagnosis is generally considered to be so reliable that some authors claim that œsophagoscopy is unnecessary. Two cases, however, are described which illustrate the difficulties of diagnosis because no pouch was found.

The good results of early operation correspond with those of other writers, but the later histories are not satisfactory, though in some cases in which the X-ray picture showed an unsatisfactory condition the difficulty in swallowing was nevertheless slight. It is not easy to find in the literature reliable information concerning the late after-histories of patients operated upon. The writer does not consider it surprising when one considers the existing adverse pathogenic factors that there may be relapses either after diverticulopexy or excision.

The rule generally accepted appears to be that every diverticulum should be operated upon, but Guisez has taken a conservative stand and operates only when there is danger of starvation ; otherwise he treats his patients by dilatation by multiple bougies and obtains excellent results.

The author feels doubtful how his patients should be treated in the future, though patients suffering from starvation and with a diverticulum descending into the thorax will have to be operated upon. He refers briefly to Seiffert's recent suggestion that the lowest part of the pharyngeal constrictor and the uppermost part of the œsophageal musculature over a distance of 3 to 4 cm. should be divided to reduce the muscular spasm which is an important ætiological factor in producing the condition.

H. V. FORSTER.

Abstracts

MISCELLANEOUS

Allergic coryza and bronchial asthma caused by silk-moths. DR. ISAMU KUNITSUGU, Fukuoka. (*Oto-Rhino-Laryngologia*, viii., 3, 221.)

The patient, aged 37, was the maker of egg cartons for the breeding of silk-worms. For seven years he had suffered from cough, nasal obstruction, watery rhinorrhœa, lachrymation and a feeling of oppression at the time of placing the egg cartons. When the attack was on one could see œdematous swelling of the nasal mucous membrane, œdema of the eyelids and redness of the mucous membrane of the pharynx and larynx. The attack was excited only by scales from the wings of the silk-moths and not by the silk cocoon or silk-worm. Septal resection and removal of the middle turbinate had proved useless.

JAMES DUNDAS-GRANT.

The question of "collar" mediastinotomy. EMILE WESSELY. (*Mschr. für Ohrenheilkunde*, 1934, January.)

As a basis of this article the author has reviewed the records of the large amount of material in the last fifteen years available for this purpose in the Clinic to which he is attached.

Beginning with a survey of the intricate anatomical problems of mediastinitis associated both with various pathological lesions and operative procedures in the neck, and the development and rationale of these prophylactic measures by way of averting complications, he describes the operation, and his account is supported by very graphic clear diagrammatic illustrations. The technique is as follows :—

An incision is made along the anterior border of the sterno-mastoid muscle in the lower two-thirds of the neck, exposing the superficial fascia.

The anterior belly of the omo-hyoid muscle which crosses this area is then defined, freed, and divided between two ligatures.

The sterno-mastoid muscle is then retracted outwards and the lateral lobe of the thyroid gland inwards, revealing the silvery appearance of the loose cellular tissue lying between the capsule of the thyroid gland and the sheath of the great vessels, through which one is now able, without injury to the vessels, to reach quickly both the anterior aspect of the vertebral column, and also the space behind the œsophagus and sheath of the vessels.

Care must be taken in respect of the lower portion of the wound where the inferior thyroid artery and vein lie but, after ligature of these vessels, the posterior mediastinum down to the third thoracic vertebra can be exposed by blunt dissection.

This method of approach also serves for many operations such as an external œsophagotomy; for exposure of that part of the gullet and hypopharynx in the case of an impacted foreign body; for the opening of a deep-lying inflammatory lesion of the same structures; for the avoidance of the spread of inflammatory conditions of the skull which threaten to set up a mediastinitis by this route and, finally, as a prophylactic measure by inducing a barrier formation against infection of a healthy mediastinum from any suspected descending inflammatory process; in this latter case iodoform gauze may be laid in the depths of the wound, which in a few days leads to a surrounding mild inflammation, shutting off the mediastinum from the infection above.

For the idea and development of this operation, we are indebted to Professor Marschik.

During the years in question, 268,823 patients were treated in this Department, of whom ninety-eight cases demanded consideration for some extreme inflammatory condition of the cellular tissue of the neck. In fifty-six of these, collar mediastinotomy was performed, with the result that thirty-one recovered and twenty-five died.

These fifty-six cases can be yet further divided into two groups: (1) Those in whom the operation was undertaken as a preventive measure, and (2) Those in whom the operation was performed for relief of conditions in which the inflammatory processes, with threatened invasion of the mediastinum, had already occurred.

On reviewing the figures of these two final groups they had been rather surprised to find that they had not practised *preventive* mediastinotomy since the year 1925, and that, under these circumstances, the percentage of recoveries had been almost the same. The explanation was probably due to the fact that, as Professor Hajek had recently especially emphasized, the inflammatory process itself acted as a favourable influence in producing a barrier against its own spread.

As regards the symptomatology of these cases, the author points out that many are not characterized by a raised temperature; that fluctuation is often not obtainable, but that tenderness over the vessel sheath is a very characteristic symptom, whilst, more important of all, is even a very low grade œdema in the lower third of the neck, especially if this is combined with a tenderness over the vessel sheaths.

The article provides a very accurate description of, and well argued commentary on, the operative treatment and symptoms concerned in this question.

ALEX. R. TWEEDIE.