and in 1914 was treated by surface application of radium. The condition healed, and remained healed until early in 1934, when there was a small ulceration on the lower part of the pinna and adjoining the mastoid area. Deafness and aural discharge were noticed at this time. X-ray examination showed the mastoid to be largely eroded.

June, 1934: Patient referred to Mr. Stanford Cade who irradiated the involved area as follows: 25.6.34: Interstitial needling, 2,034 mgm.-hrs.; 7.7.34: Surface application, 2,080 mgm.-hrs.

August, 1934: All ulceration healed; no discharge from ear.

December, 1936: Patient complained of pain in neck and shoulders (rheumatism) and very slight occasional serous discharge from ear. No ulceration behind the ear and no glands palpable. The introduction of a speculum into the contracted meatus caused bleeding.

January, 1937: Intrameatal biopsy revealed "squamous-celled carcinoma, probably derived from a rodent ulcer" (Dr. W. Newcomb).

X-ray examination shows erosion of the posterior part of the petrous, the entire mastoid and part of the squama, also portions of the occipital and parietal bones.

There are no nerve palsies and the patient is still playing golf, quite unaware of the true condition.

The patient is now undergoing a course of tele-radiation given by Mr. Stanford Cade, who is employing the 4 gramme radium bomb.

ABSTRACTS

EAR

Labyrinthine Deafness with Sigmatism in a family in which several generations of marriage with blood relations had taken place. DR. RYO TAKAHASHI. (*Oto-Rhino-Laryngologia*, X, 1, 7, 1937).

The writer followed up a very complicated list of relations among whom repeated inter-marriage between uncles and nieces had taken place through four generations. In the father and three of his five children there was sigmatism combined with dullness of hearing; the two other children died of profuse nasal hæmorrhage. More thorough examination showed that the dullness of hearing was exclusively labyrinthine and combined with sigmatism. The "s" sounds were replaced by "t" sounds, but the speech disturbance steadily improved as the patients grew up. This labyrinthine deafness is without doubt the result of the inter-marriage of the blood relations in which the deafness with sigmatism appeared to be unquestionably the consequence. The writer was of the opinion, along with Köhler, that sigmatism is to be attributed to the loss of

hearing for the higher tones and that it corresponds to Gutzmann's para-sigmatism. JAMES DUNDAS-GRANT.

A Case of Juvenile Otosclerosis. E. SCHLANDER. (*Monatsschrift für Ohrenheilkunde*, lxxi, 513, 1937.)

A girl, aged nine years, died from meningitis, following a fulminating otitis media. The temporal bones were examined histologically, when a bilateral otosclerosis was accidentally discovered in addition to a typical petrositis.

The otosclerotic areas were found in the usual situations. In both bones the oval windows were involved, the left being affected to a much greater extent.

The examination supported Mayer's view that the size of the affected area has nothing to do with the stage of development reached by the otosclerotic process. Around the right oval window, the disease was much more advanced, although the area involved was smaller. The trabecular bone was more compact, and there was scarcely any absorption. The left side showed vigorous formation of new bone in a much younger stage.

The patient had presented no symptoms of otosclerosis, and before the onset of the otitis, function was normal. This could be explained by the facts that there was no fixation of the stapes, and no involvement of the inner ear. The case was instructive, showing that, despite the presence of extensive otosclerosis, clinical diagnosis of the disease may be impossible.

The article is illustrated with seven micro-photographs.

DEREK BROWN KELLY.

Model Ear for Paracentesis. Z. WEIN. (*Monatsschrift für Ohrenheilkunde*, lxxi, 551, 1937.)

A model ear made of india-rubber is mounted on an adjustable stand. The meatus is curved as in the living subject. The drum head is represented by transparent paper carried in the form of a roll, on a system of spools similar to that of a film camera. That portion of the roll acting as the drum head can thus be readily renewed.

The short process and the handle of the hammer are reproduced in metal, and arranged to show through the transparent paper membrane in a life-like manner.

The instrument has been found of value for teaching and practising the art of paracentesis. DEREK BROWN KELLY.

Scarlatinal otitis and hereditary constitution of the mucous membrane. H. MAYER. (*Hals- usw.*, Arzt, Erbblätter, 18-34, 1937.)

Middle-ear suppuration after scarlet fever heals quickly in the majority of cases, but becomes chronic in a small proportion.

Certain external factors may be responsible, e.g. the virulence of the organisms, the presence of septic tonsils and adenoids, the formation of a large perforation which allows constant re-infection. The author, however, agrees with Albrecht and Schwarz who believe that the main factor is an inherited predisposition of the mucous membrane lining the middle-ear tract. The same constitutional and inherited factor would determine whether a mastoid process becomes well pneumatized or not ?

The temporal bones were X-rayed in a series of children with scarlatinal otitis. Among the cases in which the otitis had healed rapidly there was a much larger proportion of well pneumatized mastoid processes, than among those in whom the otitis became chronic.

The author further investigated the family histories in a fairly large number of such cases. In the families of the children with chronic otorrhœa after scarlet fever, there was a high proportion of members who had suffered from otorrhœa. This did not apply in the case of the children in whom the otitis had healed rapidly.

J. A. KEEN.

On proving the origin of Meningitis. H. MARX. (*Hals-, usw.*, Arzt, xxviii, 150-53, 1937.)

The author describes and illustrates sections of a temporal bone which proved an otogenic origin in a case of meningitis. It was a question of compensation. The patient, a man, aged 45, developed middle-ear suppuration during the War and this had been recognized as a service disability. For many years he had no special ear symptoms and no treatment, but then died rather suddenly from meningitis. The sections of the temporal bone showed a septic focus in a cell near the upper border of the petrous pyramid. From this region the suppuration had invaded the labyrinth and the meninges.

The special interest lies in the fact that no *post mortem* examination was made at first. Compensation claims arose and an exhumation order was made six weeks after death. The temporal bone came from a body in a fairly advanced state of decomposition. In spite of this, the sections were perfectly good (see illustrations). The histological details are as easily recognized as in specimens obtained immediately after death.

J. A. KEEN.

The Mechanics of the Middle-ear Prosthesis. A. G. POHLMAN (Omaha). (*Annals of O.R.L.*, lxv, 351, 1936.)

Many patients who are victims of deafness resulting from a large or total defect of the membrane and ossicles, can greatly improve their hearing by means of a prosthesis applied to the inner tympanic wall. In its most familiar form this consists of a small

pledget of cotton wool moistened in liquid paraffin. The patient can himself tell when this is in the correct position, but the narrowness and depth of the meatus prevent the otologist from telling where this exact situation is. It has generally been assumed that it is the occlusion of the round window which effects this improvement, but the author is of opinion that covering either the round or the oval window would give the same effect. Hughson and Crowe found that the application of a moist pellet of cotton wool to the round window improved the hearing which they attributed to a damping of the membrane of the round window and thereby reducing its efficacy as a sound absorbing structure. The writer's interpretation, however, was that the cotton wool vibrated and acted as a transformer of vibrations, a theory substantiated by the fact that blockage of the round window by a non-vibrating substance caused a loss of hearing rather than enhancement.

Arising from this experiment, it has been suggested that a fascial graft applied to the round window might improve the hearing but the operation would, of necessity, be a severe one, the result problematical, and out of all proportion to the risk entailed.

The opportunity of experimenting occurred to the author in a patient who had had a radical operation performed on both sides. Using a cotton wool pellet he certainly had an increase in hearing, but was still Rinne negative, and the improvement in hearing was comparatively slight. A delicate probe of bamboo, tipped with a small bead of dental stent, was applied to the oval window. No improvement in hearing was noted, but conduction of vibrations through the probe was marked. Next a diaphragm was placed in the meatus just touching the bamboo probe. The immediate result was a great improvement in the hearing, and the Rinne test was now definitely positive. Damping of the diaphragm by touching eliminated this immediately. The improvement in hearing was some 40 decibels. The author considers that such a light prosthesis might be worn indefinitely without discomfort, and no untoward reaction, and is carrying out further experimental work to produce a simple prosthesis of maximum efficiency.

GILROY GLASS.

NOSE AND ACCESSORY SINUSES

Intubation of the Maxillary Antrum for Acute Empyema. N. ASHERSON. (*Lancet*, i, 1399, 1937.)

The author urges the use of this method in place of puncture and lavage through the inferior meatus, and describes two cases. He considers that intubation (the technique of which he describes) has the advantage of giving that continued antrum drainage which is otherwise obtainable only by operation, avoids any complications

of the latter, does not incapacitate the patient to any extent, and its application in suitable cases will prevent the suppuration from becoming chronic.

MACLEOD YEARSLEY.

Ciliated Nasal Epithelium : its culture in vitro. Preliminary report. ARTHUR W. PROETZ and MARIAN PFINGSTEN (St. Louis). (*Annals of O.R.L.*, xlv, 400, 1936.)

Several years of experimental work with ciliated mammalian nasal epithelium, either removed from the animal and kept mobile, or studied *in situ*, has stimulated an endeavour to grow such tissue. The tissues employed were fragments of turbinates taken from the guinea pig fœtus at term, and the medium employed was that of Vogelaar. A pregnant animal is bled to death, and the embryos removed, and placed in a sterile Locke solution in which the necessary manipulations are carried out, and the small pieces of epithelium from the turbinates are implanted in the medium, and sealed in a Maximow slide at 37·5° C. When liquefaction occurs the culture must be changed or re-fed. Cinemicrograph films were taken at a rate of one frame in 20, 40 or 60 seconds, and the resulting film, enabling growth to be shown, speeded up on the screen. The strands of epithelial cells which grow are covered with active cilia which cannot be distinguished from the mother cells and which show ciliarly streaming in the same way as the normal nasal mucosa.

GILROY GLASS.

Telangiectasis of the Nose : Treatment by micro-injection of Sclerosing Fluid. H. I. BIEGELEISEN (New York). (*Annals of O.R.L.*, xlv, 416, 1936.)

A very fine needle is passed through the skin into the dilated capillaries over the surface of the nose, and a few drops of 30 per cent. sodium chloride are injected, 2 to 8 minims being used. The immediate result is thrombosis followed by shrinking and finally obliteration of the capillary.

The method appears to be safe, but as a precaution against potential spread to the angular veins, pressure is maintained over them while the injection is being made. Only one vessel is dealt with at a sitting.

GILROY GLASS.

TONSIL AND PHARYNX

Remarks on the Surgical Removal of Bleeding Naso-pharyngeal Fibroma. G. CANUYT. (*Les Annales d'Oto-Laryngologie*, March, 1937.)

These growths are very uncommon, but the author having recently had to deal with such a case and, the result having been

very satisfactory, he gives us the benefit of his experience and describes the main principles which he believes should govern this type of case. The patient was a boy of 12, and a detailed case history prefaces his remarks. The actual surgical approach was through the trans-maxillo-nasal route under local and regional anæsthesia. The author insists that the comparative absence from bleeding was due to the fact that a preliminary blood transfusion had been administered. The delivery of the large tumour was effected by avulsion. The point of insertion of the tumour was identified as being the choanal margin in the right ethmo-sphenoidal region. The three main points to be observed in these cases are (1) Preliminary blood transfusion, (2) Local and regional anæsthesia, (3) Surgical approach by the trans-maxillo-nasal route.

M. VLASTO.

ŒSOPHAGUS AND ENDOSCOPY

Splitting of the Œsophagus in Suppuration of the Posterior Mediastinum. K. VOGEL. (*Hals-, usw.*, Arzt, xxviii, 183-92, 1937.)

Abscesses in the posterior mediastinum result from perforations of the œsophagus caused by sharp foreign bodies or from trauma during œsophagoscopy, e.g. for stenosis. An early sign which is not necessarily serious, is surgical emphysema in the posterior part of the neck. An X-ray may show a clear area between the œsophagus and the vertebral column due to an accumulation of air. If subsequently the temperature rises and the patient complains of the characteristic severe pain with every breath and on swallowing, a mediastinitis must be diagnosed and the outlook becomes very serious.

The operation which may save the patient is a wide exposure of the tissue spaces behind the œsophagus in the lower part of the neck. But when there is a definite abscess in the posterior mediastinum, this operation is not sufficient and the abscess must be opened and drained. This is done through the œsophagoscope with a special type of long scissors which enable the wall of the œsophagus to be split in the posterior median line (Seiffert's technique). The cut must be made strictly in the posterior median line in order to avoid injury to the recurrent laryngeal nerves. The author has had no difficulty in following up collections of pus in the posterior mediastinum to within 3-4 in. of the diaphragm, and he describes some typical cases.

J. A. KEEN.

Abstracts

A satisfactory method for the Irradiation of Malignant Disease of the Œsophagus. N. J. BIRKBECK, J. O. BEAVIS, and H. R. HUSTON (Dayton, Ohio). (*Annals of O.R.L.*, xlv, 412, 1936.)

One of the greatest difficulties in the intra-œsophageal radiation of malignant disease is in keeping the radium element *in situ* for an adequate period.

The authors' method is to perform a gastrostomy, and to approach the malignant structure from below. The radium element is contained in a 5 in. long brass cylinder, covered by 1 mm. of cellulose nitrate as a filter to secondary radiation. For one inch at either end there is an inflatable rubber bag reducing the actual surface to 3 in. The applicator is pulled into position by a thread from above and, once in the proper site, the rubber bags are gently inflated with fluid, thus preventing movement either up or down, until an adequate dose has been given. In practice the dose is 1,200 milligram hours per inch of surface, given over a three to four day period.

GILROY GLASS.

MISCELLANEOUS

Cysts of the Nasopalatine Canal. C. BOWDLER HENRY. (*Lancet*, i, 1326, 1937)

The author states that these, though seldom recorded, are not uncommon. Mayer found an incidence of 1 in 66 in 600 cadavers, and 1 in 100 skiagraphically in living adults. Their main importance lies in risk of infection, with pain and focal toxemia. He describes their anatomy, with figures, their signs and symptoms and operative treatment. The cyst is easily shelled out of the bony chamber, but is usually attached to the upper nasal portion of the ducts and is adherent to the deep surface of the palatal integument below.

MACLEOD YEARSLEY.

Change in the Age of Mortality from Diphtheria. R. M. F. PICKEN. (*Lancet*, i, 1445, 1937.)

The author gives tables showing that the well-known shift of diphtheria mortality from pre-school to school ages in England and Wales and in London is shown to have continued up to recent times. In London it is apparently not entirely, nor even mainly, due to a change of incidence, and there has been there a shift of fatality which is most striking in the period 1932-5, which is probably not artificial. A similar change in fatality can be traced in Manchester and Glasgow, but should not be assumed to have occurred in other areas. The explanation may possibly be found in changes of strain

of *Corynebacterium diphtheriae,* and it is suggested that immunization of the younger schoolchildren should not be neglected in favour of infants at the end of the first year of life.

MACLEOD YEARSLEY.

Spontaneous (non-traumatic) Atlanto-axial Subluxation. IRA FRANK, M.D. (Chicago). (*Annals of O.R.L.*, xlv, 405, 1936.)

Dislocation of the atlas on the axis is generally the result of violence, but there is a type which occasionally occurs in the presence of sepsis in the neighbourhood, and unassociated with trauma. Twenty-four such cases have been published to which the author adds one more, resulting from a retro-pharyngeal abscess.

The lesion can only occur as a result of rupture or relaxation of the transverse ligament, and in these septic cases the condition is potentially one of relaxation only. The subluxation is forwards and accompanied by a certain degree of lateral rotation. The one factor in all known traumatic cases has been the presence of an inflammatory focus in the neck. After some seven to ten days of such an infection there is decalcification of the lateral part of the ring of the atlas, which becomes softened, and no longer affords a secure attachment of the transverse ligament. The slightest trauma may avulse the ligament and permit an anterior displacement of the atlas.

The case reported by the author is of a child, 9 years of age, who developed a non-traumatic subluxation following a retro-pharyngeal abscess. Treatment was by hyperextension, and using the Sayre sling. The result was a complete cure of the deformity.

GILROY GLASS.

Pathways involved in Pains of Nasal and Para-nasal Origin referred to the Lower Cervical and Upper Thoracic Segments and the Upper Extremity. ALBERT KUNTZ (St. Louis). (*Annals of O.R.L.*, xlv, 394, 1936.)

Certain pains in the neck, upper thorax and upper extremity which are associated with lesions in the mucous membranes of the nose and paranasal sinuses exhibit the characteristic features of referred pains. In view of the anatomical data which indicate that afferent components of the upper thoracic spinal nerves traverse the plexuses on the common and internal carotid arteries and reach the mucous membranes of the nose and paranasal sinuses, these pains may be regarded as referred, in conformity with Head's theory of the localization of referred pains.

Referred pains are accompanied by reflex phenomena which play a part in the cause of the sensations of pain. Impulses directly responsible for sensations of pain probably arise in pain receptors

in the peripheral area in which the pain is localized. The stimulation of these receptors is caused by the reflex responses, probably through the accumulation of waste metabolites or the liberation of a stimulating chemical substance.

The mechanisms involved in the components of the referred pains in question, which are due to reflex phenomena, may be outlined as follows: Impulses arising at the site of a lesion in the nasal or paranasal mucosa are conducted into the spinal cord through afferent components of the upper thoracic nerves, reach the corresponding ganglia of the sympathetic trunks through pre-ganglionic neurons, and are conducted to the periphery through sympathetic neurons. Pain receptors at the periphery are stimulated; the impulses arising in them are conducted into the spinal cord through afferent components of the corresponding spinal nerves and upward through the lateral spinothalamic tract on the contralateral side.

[Author's summary.]

CRITICAL REVIEW

Recent Experimental Work on the Theory of Hearing carried out at the Ferens Institute (described in reprints from the Proceedings of the Royal Society, Series B, No. 827, Vol. 122, pp. 175-85, by C. S. Hallpike, H. Hartridge, and A. F. Rawdon-Smith; and *ibid.*, pp. 186-97, by D. W. Ashcroft, C. S. Hallpike, and A. F. Rawdon-Smith).

The tendency of physiological experimental work is to become more specialized and refined in its methods, and in the elaborate apparatus of which it makes use. No doubt results are being obtained which would have been impossible a few years ago, but the number of those who are capable of following the development of any particular field of research is being progressively restricted to those highly trained in that special branch of science. The theory of hearing is a subject in which aural surgeons can hardly fail to be interested, but it is becoming increasingly difficult for most of them to penetrate the thick-set hedge of technicalities with which modern research surrounds the subject. Any layman who sets out to comment on, elucidate, or criticize recent researches must approach the task with considerable trepidation, as does the present writer.

The publication, in 1930, by Wever and Bray, of their remarkable demonstration of the electrical disturbances evoked by sound stimuli acting on the mammalian cochlea produced a profound impression, and unsettled all existing opinions as to the mechanism