however, think it a universal instrument. She said this led to the question of prescription. She agreed that one could not prescribe hearing aids exactly as spectacles, but what little could be done in that direction had given very good results, which suggested that the ear was not nearly so sensitive to distortion as the eyes.

The instrument designed at the Department for Education of the Deaf of Manchester University has got a very good response curve and it was very useful, but Dr. Kerridge did not think that it was necessarily the ideal instrument for all deaf people.

Although she was not a member of this Society, Dr. Kerridge said she would like to support very strongly the motion that some definite action should be taken by Scottish otologists regarding hearing aids. The clinic at University College Hospital was started largely as an experiment, but the almost overwhelming response to it emphasized greatly the need and neglect of deaf people.

The PRESIDENT said he felt they had had a most interesting afternoon and he asked the Society to express their gratitude to those who had read papers and taken part in the discussion. He asked if it was the wish of the Society that the Secretary should write to the firms who had demonstrated their appliances that afternoon and thank them for their demonstrations.

ABSTRACTS

EAR

Audiometers and Hearing Aids. AUSTIN A. HAYDEN, M.D. (Chicago). (*Jour. A.M.A.*, March 5th, 1938, cx, 10.)

The audiometer is an electrical instrument for measuring hearing and should be used in a quiet room. Direct or alternating current may be used. It measures loss of hearing in decibels at calibrated frequencies and supplants such old methods as the voice, watch and tuning forks. In general the results of tests with the audiometer are plotted so that frequency runs horizontally across the chart from 64 to 8,192 or over and is calibrated in octaves, half-octaves and/or octave letters. Intensity is measured in decibels and is charted vertically.

Electric hearing aids raise the sound level for transmission by air to the drum and by bone through the mastoid to the inner ear. They are portable, semi-portable and stationary. The first uses small dry cells, the second either large dry cells, mains current or both, and the last mains supply only.

Portables are amplified or non-amplified. They are specially adapted telephone hook-ups, consisting essentially of a transmitter, receiver and battery. In the amplified set an amplifier or booster, with its second circuit, is added. The frequency range of portables lies principally between 256 and 2,000 cycles per second, corresponding with conversational tones. By altering the construction

of the transmitter the sound can be " peaked " or intensified within three divisions (low, middle and high) to fit approximately to the loss of hearing shown on an audiogram.

The actual improvement made in the patient's hearing can be ascertained by attaching the audiometer's ear-piece to the transmitter of the patient's hearing aid and charting the audiometer in the usual way.

ANGUS A. CAMPBELL.

On the Technique of walling off the Fenestra Rotunda, with a consideration of the associated Physiological and Pathological Problems of the Ear. T. N. MILSTEIN (Leningrad). (*Acta Oto-Laryngologica*, September 1st-October 30th, 1937, xxv, 5.)

By means of artificial methods in experimental animals the author succeeded in stimulating an exuberant growth of granulation tissue from the edges of the fenestra rotunda so that this area was completely walled off. He then subjected the animals to sustained high tones: degeneration of the organ of Corti and the spiral ganglion cells was found in the normal ear, whereas on the experimentally operated side no such degeneration had taken place, the sound waves having been apparently excluded from the inner ear by the walling off process.

In animals with a spontaneous middle-ear suppuration, but with the membrane of the fenestra rotunda unaltered, a similar degeneration was found to have occurred in the cochlea, but to a lesser degree.

From these experiments the author draws certain conclusions about the physiological function of the fenestra rotunda and discusses the question of occupational injury to the inner ear.

[Abstract of author's summary.] H. V. FORSTER.

Sinography. A method of Radiography in the diagnosis of Sinus Thrombosis. PAUL FRENCKNER (Stockholm). (*Acta Oto-Laryngologica*, September 1st-October 30th, 1937, xxv, 5.)

Sinography is a method of investigation to determine the existence of an obstruction to the flow of blood in the sinuses or in the jugular vein. It is carried out by taking X-ray pictures whilst injecting a radiopaque substance into the sinuses.

This method is destined to serve as a means of diagnosis supplementary to other methods of investigation in certain cases of sinus thrombosis of otitic origin and when it is difficult to decide whether there is or is not present a sinus thrombosis and on which side to look for the thrombus.

The technique is as follows. By using a special trephine the superior longitudinal sinus is exposed. Into this vessel a radiopaque fluid is injected and at the same time the X-ray picture is taken. If there is an obstruction to the blood stream in one sinus or the

other the opaque image will localize it, but any abnormalities will need to be carefully considered in judging the results of the examinations. In certain cases it is very important in showing an obstruction or a congenital defect, on one side, of the transverse sinus.

In such a case the jugular should not be ligatured nor the sinus packed on the side showing a sinus larger than normal unless a thrombosis is certain. So far these experimental investigations have been of value in the development of technique and in studying the behaviour of the blood flow when meeting an artificial obstruction.

A study of certain clinical cases and other observations suggest that from time to time this method may offer advantages.

[Translation of author's abstract.] H. V. FORSTER.

NOSE

Some remarks on the Pathogenesis of Nasal Lupus. H. VIDEBECH (Viborg). (*Acta Oto-Laryngologica*, September 1st-October 30th, 1937, xxv, 5.)

In his summary the author briefly concludes that endonasal lupus vulgaris is probably a disease of hæmatogenous origin.

H. V. FORSTER.

Comparative Histo-pathological, Bacteriological and Clinical Examination of Chronic Maxillary Sinusitis. LORENTZ HEERUP and KARSTEN KETTELL (Copenhagen). (*Acta Oto-Laryngologica*, September 1st-October 30th, 1937, xxv, 5.)

On the basis of his own investigations the author gives a detailed description of the histological picture of chronic maxillary sinusitis.

On the whole, Manasse's classification of the affection into the three forms of chronic œdematous, chronic granular, and chronic fibrous sinusitis ought to be adhered to. The probable development of the histological picture is accounted for. There is no causal relation between bacterial findings and histopathology.

[Author's summary.] H. V. FORSTER.

Two cases of Zona Ophthalmica cured in six to nine days by applications of Bonain's Solution to the entire Middle Turbinate Bone. Dr. KOWLER (Marseilles). (*Annales D'Oto-Laryngologie*, December, 1937.)

Herpes of the ophthalmic division of the Vth nerve is a very painful and disfiguring condition. The fact that alcoholic injections into the sphenopalatine ganglion relieve the condition is well known. Good results have likewise been reported from applications of Bonain's liquid to the region immediately contiguous to the ganglion, namely the posterior extremity of the middle turbinate bone. Both the cases reported in detail in this short paper were treated by surface application of Bonain's liquid to the whole of

the middle turbinate on the affected side, and the relief obtained was sufficiently dramatic to prompt the author to publish his experience. Bonain's liquid is better known on the Continent than over here. It consists of equal parts of menthol, crystals of carbolic acid and cocaine hydrochloride. These three solid substances liquefy when they are mixed together. A few drops of 1 in 1,000 adrenalin are sometimes added to the mixture.

The author draws attention to the fact, however, that in both these cases there was a mild recurrence of the symptoms after the improvement following the initial application; these cases must, therefore, be closely watched.

M. VLASTO.

Remarks on the Treatment of Nasal Polyposis. PIERRE COUSSIEU. (*Annales D'Oto-laryngologie*, January, 1938.)

It has been long recognized that nasal polypi are symptomatic of some underlying local cause. We do not yet fully understand, however, what this local cause is, but strongly suspect that there is some diathesis which predisposes the individual to this condition. This is more likely to be the case in extensive bilateral polyposis which recur rapidly after removal. The author contends that in view of the fact that a sufferer from nasal polypi is only inconvenienced thereby and is not seriously ill, that the surgeon should use his discretion before engaging in extensive surgical procedures which are not devoid of risk. The various types of polypi with regard to their clinical and pathological points of interest are first discussed. Attention is then focused on the soil from which the polypi are seen to arise and reference is made to Luc's observation that in most cases of polypi, there is no evidence whatever, even histologically, of osteitis. The author insists that every case of nasal polyposis must be treated on its own merits. For instance, we should deal far less drastically with unilateral polypi in an individual who has had a long period of freedom after a previous removal, than we should do in the case of a bilateral polyposis in which recurrence has occurred in a much shorter period. Finally the author considers the question of how far the accessory sinuses are implicated in nasal polyposis and, without laying down any rigid line of conduct, offers certain suggestions as a guide to the surgeon in the treatment of his cases.

M. VLASTO.

PHARYNX

Classification and Treatment of Malignant Tumours of the Tonsils. BETTY LEVIE (Amsterdam). (*Acta Oto-Laryngologica*, September 1st-October 30th, 1937, XXV, 5.)

Malignant pharyngeal tumours may be divided into four clinical groups :—

(*a*) Keratinizing carcinoma.
(*b*) Non-Keratinizing carcinoma.
(*c*) Lympho-epithelial tumours.
(*d*) Sarcoma.

Examples of all groups are found in the tonsillar region. In young people sarcoma and lympho-epithelioma are more common but epidermoid carcinomata attack older people and arise in connection with irritants, tobacco, alcohol, and syphilis, and so appear more often in the aged—particularly in males. These outside influences are less evident in anepidermoid carcinoma.

Patients usually present themselves for treatment late in the disease, and in about 70 per cent., metastases have already developed.

The results of treatment, apart from the degree of development of the disease on admission are largely dependent on the variety of tumour. The best results were achieved in those with tumours sensitive to X-rays (lympho-epithelial tumours, sarcomata, and anepidermoid carcinomata). The results of treatment of epidermoid carcinomata by Roentgen rays or radium up to the year 1932, were better when glandular metastases, already present or arising later, had been treated surgically. Though the numbers of such cases of epidermoid carcinomata were small, yet it was possible to conclude that this combined method of treatment gave the best results and agreed with the experience of treatment of these growths in other areas, for example in carcinoma of the tongue.

In the case of sarcomata and lympho-epithelial tumours we should expect good results from X-ray therapy only when distant metastases have not arisen, though it is usual in these cases for such metastases to arise early in the disease.

[Abstract of author's summary.] H. V. FORSTER.

The Management of Pulsion Œsophageal Diverticula. FRANK H. LAHEY, M.D. (Boston). (*Jour. A.M.A.*, October 30th, 1937, cix, 18.)

The author bases this article on an operative experience of eighty-two cases and a follow-up study of fifty-three cases. Pulsion diverticula far outnumber all other types and occur at the œsophago-pharyngeal level. They are due to a protrusion of the mucosa and submucosa through the muscular wall of the hypopharynx. The sac lies between the pretracheal and prevertebral fascia, and its neck is surrounded by fibres of the inferior constrictor muscle. The relationship of this muscle to the neck of the sac is of the utmost importance and unless the constrictor muscle fibres about the neck of the sac are carefully removed it is very likely to recur. The sac is directly behind the thyroid and is closely related to the recurrent laryngeal nerve. In this series four temporary and one

permanent case of paralysis of this nerve developed post-operatively.

The symptoms in order of frequency are: difficulty in swallowing, regurgitation, gurgling noises, choking, strangling and loss of weight. The gurgling noises are due to the mixture of air with food in the sac and the choking is due to the spilling over of the sac contents into the larynx. Two patients had pulmonary abscess from this cause.

Downward traction of the sac on its neck brings its opening into a transverse position so that it is often difficult to find the normal œsophageal lumen when passing a feeding tube into the stomach.

In two cases the sac had been perforated, in one case by a bougie and in the other by an œsophagoscope, before coming to the writer. Prolonged mediastinal drainage was necessary before operation could be performed.

The two-stage operation is strongly recommended and is done under local anæsthesia and without passing an œsophagoscope into the sac. Post-operative dilation with a modified Plummer bag is very helpful.

The end results in fifty-three cases are: two failures, two poor results and forty-nine good results.

ANGUS A. CAMPBELL.

LARYNX

Radiography of Intra-laryngeal Epitheliomata. FR. BACLESSE and JEAN LEROUX-ROBERT. (*Les Annales D'Oto-laryngologie*, December, 1937.)

Radiography of the larynx in profile has many interesting and useful applications in connection with the study of epitheliomata of the laryngopharynx. To quote but one instance, the manner in which one can follow the regressive changes in neoplasms which take place after radiotherapy. The special technique on which these observations are based is described, and the authors stress the importance of being thoroughly acquainted with the reading of the radiogram of a normal larynx. Radiograms and schematic drawings of a normal larynx are shown to illustrate this point and the radioscopic interpretation of every part of the larynx is minutely described. The authors proceed to discuss with illustrations the interpretations of pathological conditions and they show, for instance, a drawing of a papillary carcinoma of a vocal cord in which it is impossible to tell without radiography the presence or otherwise of a subglottic extension. Many other similar cases are discussed, and the fact that the interpretations of all these cases have been controlled by observation of specimens after surgical removal, proves the practical value of this method of investigation.

M. VLASTO.

Miscellaneous

Complications following Tracheo Bronchoscopy. GUIDO GUIDA (Italy). (*Acta Oto-Laryngologica*, September 1st-October 30th, 1937, XXV, 5.)

Upon the basis of three clinical cases the author shows that a few hours after tracheo bronchoscopy patients not infrequently suffer from respiratory troubles caused by œdema or other inflammatory conditions of the subglottic region.

These inflammatory conditions may arise either from tubes unsuitable for the laryngeal opening or from protracted handling.

In his opinion, the selection of suitable tubes and the holding of the patient's head so as to ensure a proper position of the tube in the tracheal axis are essential.

In the above cases he used the treatment suggested by van Gilse and obtained very good results which prompt him to endorse its use before a possible tracheotomy.

He points out the necessity of a few days' laryngoscopic inspection of all cases after tracheo-bronchoscopic examination.

[Author's summary.] H. V. FORSTER.

MISCELLANEOUS

Wavelength in the Heating of Human Tissues by Short Wave Diathermy. JOHN S. COULTER, M.D., D.T.M., and STAFFORD L. OSBORNE, B.P.E. (Chicago). (*Jour. A.M.A.*, February 26th, 1938, CX, 9.)

A new impetus has been given to diathermy as a therapeutic agent since the introduction of short wave diathermy generators, and the physician is confronted with many confusing claims. The literature presents a confusing picture since no two workers seem to agree as to the effect of wavelength for the various non-living body tissues.

The writers made two hundred and seventy-nine temperature observations on the human thigh using high frequency currents with wavelengths varying from twenty-five to six metres. They believe that wavelength *per se* is not a marked factor in tissue heating in the living subject but that the differences in machines, the energy delivered to the patient, and technique have important roles. The electromagnetic field produces the most effective heating of live human tissues. The double cuff method of the electric field appears to be the most effective technique, but air-spaced electrodes are also effective for deep tissue heating provided the anterior surface application is used. ANGUS A. CAMPBELL.

The Toxicity of Sulphanilamide. E. K. MARSHALL, Jun., Ph.D., M.D., W. C. CUTTING, M.D., and KENDALL EMERSON, Jun., M.D. (Baltimore). (*Jour. A.M.A.*, January 22nd, 1938, CX, 4.)

The writers made a study of the acute toxicity of sulphanilamide on mice, rabbits and dogs. The drug was given by the oral route

in all cases and the toxicity appears to be relatively small. Limited experiments on dogs and mice have shown no signs of chronic toxicity and no pathological lesions in these animals after prolonged administration. No effect on the blood picture of dogs and rabbits was observed from the administration of large doses for several days, but an acidosis was produced in dogs from the administration of large single doses. Temporary decrease in the renal function was noted after large doses but no permanent kidney injury appeared to result. Acetylsulphanilamide, to which sulphanilamide is partly converted in the human body, was somewhat more toxic than sulphanilamide itself. ANGUS A. CAMPBELL.

The Leucocyte Response to Sulphanilamide Therapy. JOHN A. BIGLER, M.D., WILLIE MAE CLIFTON, M.D., and MARIE WERNER, S.B. (Chicago). (*Jour. A.M.A.*, January 29th, 1938, cx, 5.)

To determine the leucocyte response to sulphanilamide therapy, daily leucocyte counts were made before, during and after administration of the drug. Schilling counts were also made in an effort to determine the immunity response, the lymphocyte-polymorpho-nuclear ratio and the appearance of the early cell forms.

Thirty-three patients, some without infection and others with various types of infections, were studied. These infections included several patients with otitis media, mastoiditis, erysipelas, scarlet fever and streptococcal infections of the throat.

From these studies sulphanilamide seemed to cause a depression of the white blood cells even to the point of leucopenia. Agranulocytosis or granulopenia did not occur with this depression.

The drug does not produce an increase in the total leucocytes or in the proportion of the polymorphonuclear cells and seems to act independently of them.

The drug is very effective in beta hæmolytic streptococcal infections but frequent blood cell counts should accompany its administration. ANGUS A. CAMPBELL.

Treatment of Fractures of the Base of the Cranium involving the Paranasal Sinuses. G. NATHANSON (Upsala). (*Acta Oto-Laryngologica*, September 1st-October 30th, 1937, xxv, 5.)

The author gives a short survey of the views with regard to the treatment of fracture of the base of the skull and discusses in this connection the cases observed by O. Voss, R. Bárány, Kaerger, Elbin and Banzet, Hesse and himself. The author favours a prophylactic operation, consisting of wound-toilet, removal of splintered bone lamellae, especially of those bordering on the dura. This exposure of the dura when next to very slight fractures prevents

a stasis arising between the dura and the bone by the possible accumulation of inflammatory products. Afterwards drainage, either direct through the nose (which the author considers the most suitable) or through the skin is advocated. The author's material is too limited to serve as a basis for definite conclusions.

[Author's summary.] H. V. FORSTER.

The Schick Reaction and Circulating Diphtheria Antitoxin in Man. H. J. PARISH and JOYCE WRIGHT. (*Lancet*, 1938, ii, 882.)

The authors confirm the observations of Jensen and others that no fixed antitoxin titre (the "Schick level") exists above which individuals are Schick-negative and below which they are Schick-positive. Nevertheless there is a much higher level of circulating antitoxin in groups of Schick-negative than in groups of Schick-positive people.

One hundred and fourteen persons undergoing a course of immunization, many of whom were expected to have "borderline" immunity, were Schick-tested with the Schick reagents in routine use in this country. Blood samples were taken *immediately before* the Schick test, and revealed a wide zone of circulating antitoxin values corresponding to positive, negative, and doubtful Schick reactions.

Similar tests were made with "multiple Schick toxins", 61 persons being tested with fourfold and 39 with tenfold reagents. Negative reactions were obtained in persons with as little antitoxin as 0·002 to 0·0005 unit and to tenfold with as little as 0·01 to 0·002 unit per c.cm.

Pseudo-reactions with fourfold and especially with tenfold reagents tended to make readings difficult and to produce discomfort in protein-sensitive individuals. The routine use of these preparations cannot therefore be recommended.

The potential immunity of individuals with little circulating antitoxin but a negative Schick reaction is discussed.

The Schick test has been of proved value in many immunization campaigns, but a negative reaction may not indicate in all cases a state of immunity sufficient to withstand attack by virulent or intermediate strains. To maintain a sufficiently high "level of immunity", the periodic injection of prophylactic into Schick-negative as well as positive reactors may be considered advisable. MACLEOD YEARSLEY.

Hemiplegia in Diphtheria. P. SCIENCE. (*Lancet*, 1938, i, 779.)

The writer reports the case of a boy, aged 10½, who, during an attack of diphtheria, showed progressive deterioration of the myocardium and proteinuria. There was palatal paresis on the eleventh day and pharyngeal paresis on the thirty-eighth. Right facial weakness on the twenty-second day, with absence of knee and

ankle jerks and ptosis of right eyelid. On the twenty-fourth day the clinical picture was one of left hemiplegia, with a peripheral neuritis of purely motor type. Eight weeks after the onset there were slight spontaneous movements of the left leg, and thereafter the case progressed normally.

The writer cites Kennedy's case (1937) in which he said that cerebral embolism is secondary to endocarditis. Science points out that it is doubtful whether endocarditis occurs in diphtheria, and in the case he publishes he suggests that the hemiplegia was embolic. It occurred at a stage when the heart was dilated and exhibited extrasystoles. He asks: Did the enfeebled heart's action together with a dilated myocardium permit the formation of a thrombus, and was this thrombus, with the onset of extrasystoles, released into the systemic circulation to form an embolus in the lenticulostriate branch of the right middle cerebral artery?

MACLEOD YEARSLEY.

The first case of Tularemia in Laryngology. (*Trans. Vienna Lar. Rhinol. Soc. Monatsschrift fur Ohrenheilkunde*, 1938, lxxii, 368.)

In January, 1938, a man aged 34 was admitted to the dermatological clinic on account of tularemia. In November, 1936, he had skinned a hare, and became ill eight days later with shivering, fever, and sweating. This illness lasted eight days. After an interval of four weeks, swellings appeared in the neck and at the angle of the jaw on the right side.

At the time of admission, there was generalized swelling of the lymphatic glands. The nodes were tender, and the skin over them was freely movable. Cutaneous reaction with Tularamin gave a positive reaction. Agglutination tests for tularemia were also positive.

The nodes in the neck softened and were incised, releasing thick yellow pus.

During the last few weeks increasing dysphagia, worse on lying down at night, became manifest. On examination, a large sausage-shaped protuberance of the left posterior pharyngeal wall was discovered. The swelling extended to the level of the entrance to the larynx, which it almost concealed. This smooth, chronically inflamed, red swelling on palpation seemed of elastic consistence. It was incised under local anæsthesia, releasing 20 cm. of thin grey-green pus. The abscess cavity was aspirated with a suction pump. It discharged for several days and then healed.

Tularemia was first observed in 1911 in America. The causal organism belongs to the same group as that which gives rise to hæmorrhagic septicæmia in deer, pigs and fowls. It bears a similarity to the plague bacillus.

DEREK BROWN KELLY.