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Basal-Celled Carcinoma of the External Auditory Meatus—H. NEUMANN.—A woman, aged 34 years, was shown, who had complained for nine months of deafness in the right ear. No otorrhœa, no tinnitus, and only occasional right-sided headache.

On Examination.—The meatus was occupied by a mass of tissue which was very easily removed under a local anæsthetic—thus revealing a normal tympanic membrane followed by complete restoration of hearing and freedom from pain. The histological report on the tumour removed was “cylindrical basal-celled carcinoma.”

The exhibitor commented upon the extremely favourable prognosis in these unusual cases, and stated that he hoped with a combination of the radical operation and the introduction of radium that they might obtain a cure in this particular instance.

ABSTRACTS

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Air Conduction, with a Special Consideration of its Anatomical and Clinical Aspects. G. ALEXANDER, Vienna. (*Monatschrift für Ohrenheilkunde*, January and February 1931.)

So much has been written in recent years on the theory of sound conduction, both from the point of view of physics, physiology and psychology, that the author has been prompted to collect the various known anatomical and clinical facts of the subject in an attempt, if possible, to correlate the whole.

In this communication, he now offers the result of such an effort representing, presumably, his own view of the matter, supported by his interpretation of the work and the research and opinions of other investigators.

The theories and facts concerning this intricate and much discussed problem are first dealt with in an historical survey, and, after being weighed with dispassionate criticism, are finally presented with that masterly judgment and style which we have been accustomed to associate with the author's literary attitude towards the various puzzles of otology.

Thus the work of the chief writers is reviewed and summarised under the headings of “The Results of Experimental Research,” “Anatomical and Physiological Facts,” “Facts Dependent on Comparative Anatomy,” “Clinical Observations,” and “Pathological Facts,” which summaries usefully terminate the sections devoted to these special portions of the subject. Finally, the results of the whole, as they appear to Alexander, are embodied in a series of paragraphs.

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Of these latter, the following may be taken as indicating both the vast scope of the work, its clinical value, and the author's well balanced summing up:—

In the case of all those vertebrates which are provided with an air-containing Eustachian tube, closed outwardly (? *i.e.*, with an intact tympanic membrane, A.R.T.), and, in the condition of rest, not otherwise open, a differentiation must be made between the ossiculo-cochlear and aero-cochlear conduction of sound.

The ossiculo-cochlear route leads from the tympanic membrane through the ossicular chain, the oval window, the scala vestibuli and the helicotrema to the scala tympani.

The aero-cochlear route leads from the tympanic membrane *viâ* the air of the tympanum through the round window direct to the scala tympani.

The physiological acoustic stimulus is produced by vibrations of the basilar membrane in accordance with the anatomical structure of the cochlea. These vibrations cause an alteration of position of the hair cells and are then converted into a sensory stimulation of the terminal ends of these cells.

In the condition of rest the terminal ends of the hair cells lie in contact with the under aspect of the membrana tectoria.

The positions of the very mobile, though not elastic, membrana vestibularis and membrana tectoria permit only an extremely limited conduction of sound to be transmitted from the scala vestibuli to the organ of Corti; and it is only a portion of the lower tones which can be thus transmitted.

Thus aero-cochlear conduction offers a direct route, especially for the high tones, the stimulus of which can be carried to the end organs without loss of intensity.

The vibrations of the lower tones are also possibly conducted by the perilymph around the oval window *viâ* the scala vestibuli and helicotrema to the scala tympani and there assert themselves as a physiological stimulation of the basilar membrane.

In the normal ear of man, when the tube is closed, the ossiculo-cochlear and aero-cochlear conduction of sound function together. But, whilst the ossiculo-cochlear route is of supreme physiological importance, the aero-cochlear route constitutes the principal or only method of conduction of the higher tones.

The membrane of the round window can function only, for the aero-cochlear route, when the intra-cochlear pressure is not raised, and this latter can be controlled by the condition in the aq. cochleae; and, both the aq. cochleae and the lymphatic connections of the internal auditory meatus similarly subserve the conduction of sound by the ossiculo-cochlear route.

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The cochlea and labyrinth are combined anatomically in one organ, because they both control orientation and both respond physiologically to the movement of the fluid contained in the internal ear.

The stimulus of the labyrinth is the result of an active or passive movement of the head or of the whole body causing movement of the endolymph. The cochlea is a perilymphatic organ—the labyrinth an endolymphatic organ.

The necessary resilience for the functioning of the acoustic vibrations of the perilymph is provided in the aq. cochleae and lymphatic system, and the resilience for the labyrinth movements is provided by the canalis reuniens and ductus endolymphaticus, conflict between the two functions being controlled by the perilymphatic septa in the vestibule.

In the normal human ear the tube is closed during rest—thus influence on both sides of the tympanic membrane is prevented, which would thus result only in a very slight movement. Thus, too, a disturbing autophony is obviated and the tympanic membrane is unaffected by the respiratory movements.

The early appearance of deafness as the result of tumours of the 8th nerve is rendered intelligible by this physiological relationship between the aq. cochleae, internal auditory meatus, and the route of sound conduction.

In the normal human ear the aero-cochlear route is important for the conduction of the higher but not for the remaining tones.

The knowledge of sound direction, *i.e.*, orientation by means of sound, is dependent on the ossiculo-cochlear conduction of sound—but analysis of this sensation is ultimately a cerebral function.

Ossiculo-cochlear and aero-cochlear conduction act together in the human ear—the former being most active in normal ears when the tube is closed. Under pathological conditions, especially when the tympanic membrane, ossicular chain, or both, are destroyed, the aero-cochlear route is the principal route. It is only for the lower tones up to about 90 d.v. that the ossiculo-cochlear route is absolutely necessary.

When the tube is open and in the normal ear, at least at the moment of opening, the lower tones—with the exception of the very lowest—are conducted by the aero-cochlear route.

The two windows can each act as receptors of sound or corresponding resilience agents; but not simultaneously.

Pathological closure of both windows, even if the cochlea is intact, leads to marked loss of hearing, whilst, if the cochlea also is only slightly diseased, absolute deafness results.

Sound conduction in the vertebrates varies—with decrease in the development of the ossicular chain, and increase in the size of the round window, aero-cochlear conduction becomes of greater importance.

With the increase of the tympanic bulla the opening of the round

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window into the bulla also increases, and the increase of the tympanic bulla may be taken as indicating also an increase of the aero-cochlear route of sound conduction. This condition is highly developed in the cat, in which the middle ear is almost completely divided into two parts—the lower portion is represented by the bulla and round window, and the upper and posterior part contains the ossicular chain.

The bulla and round window are most highly developed in those animals which react most strongly to high tones and especially in those species which rely for orientation more on the ears than on the eyes and nose.

Great caution, however, must be observed in regarding the facts of comparative anatomy as necessarily applicable to man, and many of the arguments in the literature on this subject are therefore unreliable.

The actions of the "artificial tympanic membrane" can be explained, according to one's inclination, as evidence of either ossiculo-cochlear or aero-cochlear conduction of sound.

In man it is possible to conceive pathological changes in the middle ear which may lead simultaneously to impairment of the ossiculo-cochlear and improvement of the aero-cochlear conduction.

All otologists, perhaps, will be unable to accept unreservedly Alexander's conclusions *in toto*, but all will at once admit the vast amount of knowledge of the subject which such an effort must have entailed and the very considerable selective skill necessitated in compressing the matter into some fifty pages; all too will unite in congratulating the author and thanking him for this presentation of current opinion on a most intriguing problem of otology which is still *sub judice*.

ALEX. M. TWEEDIE.

A Contribution to the Study of Suppurative Meningitis of Obscure Origin. Professor A. I. GESEBELIN (Odessa). (*Archiv. für Ohren-, Nasen- und Kehlkopfheilkunde*, 1930, Band cxxvi., Heft 3-4.)

The author describes the case of a 22 year old medical student who was brought in unconscious in an ambulance to the clinic of his college. The history was that for six days he had attended at the ear clinic, complaining of acute pain in the left ear, and was ordered appropriate treatment. The patient did not give up his work and, at the end of this period, attended a lecture in the theatre.

On the day before admission he complained of violent headache, and of feeling ill generally. Then screaming and vomiting commenced and he rapidly lost consciousness. He was very delirious, and had to be fastened down in bed. Occasionally he became calm and slept with legs drawn up.

On examination, the patient was unconscious, the eyes were

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turned upwards and to the left. There was marked rigidity of the neck muscles. Kernig's sign was definitely present. On lumbar puncture several cubic centimetres of cloudy fluid came away under increased pressure. Inspection of the left tympanic membrane showed that it was dull with decreased light reflex. The right membrana tympani was normal.

Under the impression that the case was one of otitic meningitis, a left mastoid operation was performed with exposure of the dura and the sigmoid sinus. The cerebrum and cerebellum were explored in several directions without the discovery of pus.

The patient got worse and died on the third night.

At the post mortem the findings were reported as purulent leptomeningitis and bilateral broncho-pneumonia.

The author, remembering that his prosector had once told him how Virchow, in a case of meningitis of doubtful origin, had opened the frontal sinus and discovered that it contained pus of the same infection as that on the meninges, returned to the post-mortem room, opened the left frontal sinus and found it full of thick, green odourless pus. The right frontal sinus showed no abnormality.

The author then reviews the course of this case in detail with regard to the question of diagnosing early whether a case of meningitis has arisen from otogenic or nasal sinus infection as a primary source, with a comparison with other cases. He points out that the mortality of suppurative meningitis complicating nasal sinus infection is extremely high even when a correct diagnosis is made early in the case.

He draws attention to the value of microscopic sections of the temporal bone, and the walls of the frontal sinuses in cases in which the post-mortem findings do not give sufficient information.

C. DE W. GIBB.

Aural and Nasal Erysipelas, especially the Post-operative Forms.

Prof. INO KUBO (University Clinic for Ear, Nose and Throat Diseases, Fukuoka, Japan). (*Archiv. für Ohren-, Nasen- und Kehlkopfheilkunde*, 1930, Band cxxvi., Heft 3-4.)

The author summarises his account as follows:—"The facts show the absolute necessity of a bacteriological examination of the pus from every operation, especially aural operations, likewise the necessity of precautionary measures against possible infection.

"Between January and March 1930, we have found hæmolytic streptococci in the following cases:—

"1. From acute otitis media and acute mastoiditis—

Males	18 cases
Females	14 „
Total	.				<u>32 cases</u>

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“It is true that we had 7 cases in which what one might term an abortive form of erysipelas appeared, that is 3 cases with a faint oedematous flush, and in these the pyrexia subsided in a few days. For the treatment of erysipelas early diagnosis is of the utmost importance.

“I am convinced that, in the absence of the above precautions, the occurrence of erysipelas is only to be expected.

“Secondary infection with hæmolytic streptococci must occur during the exit of the pus, and not from the environment of the patient as was hitherto assumed.

“Those patients having hæmolytic streptococci in the pus must be treated with the same care as those having actual erysipelas. If one means to avoid the dissemination of infection by erysipelas, one must prevent contamination by secretions or by pus containing hæmolytic streptococci.

“It is clear that nose-blowing sometimes causes acute otitis media. In such cases of acute otitis media of nasal origin, I have often found hæmolytic streptococci in the pus from the maxillary antrum.

“On the relationship between maxillary antrum and ear, I intend to report on some future occasion.”

C. DE W. GIBB.

Concussion Deafness of Miners, with a Survey of the Motor Apparatus in Modern Mines. Dr. KATZCHINANN. (*Zeitschrift für Laryngologie*, usw. 1931, Band xx., p. 353.)

Aurists in the mining and industrial areas in Germany have excellent opportunities of studying traumatic deafness, especially injuries to the bony labyrinth.

In former times when the work was performed with sledge hammers and crow bars, there was already a recognised type of occupational deafness amongst miners, but this was relatively infrequent and occurred principally among older or invalid miners who were no longer fit to go underground, and were relegated to work at the “separator” above ground.

This is an iron mechanism, the working of which is accompanied by an ear-splitting clatter which gradually deafens the workers.

For the purpose of this article a distinction is drawn between miners suffering from sudden accidental injuries such as laceration of the membrana tympani or fractures of the base involving the bony structure of the inner ear, those suffering from old standing previous ear trouble (the latter, incidentally, causing trouble with regard to compensation), and those who gradually develop an inner ear deafness over a long period. Here again a distinction is made between noise deafness and that due to vibration, the latter being caused by working with compressed air apparatus in which the actual noise may be negligible.

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The vibration or concussion deafness is also found amongst locomotive engine drivers.

The condition appears to have arisen in miners since the introduction of motor machinery.

The ear tests in miners who have worked for a length of time with compressed air apparatus show: a reduction of hearing distance for the whisper from 4 to 2 metres, diminished hearing for sibilants as compared with low tones, and a shortened duration for the hearing of tuning forks.

The bone conduction is markedly diminished. This faulty hearing leads to the acquirement of a characteristic form of colloquial speech among the miners affected.

The defect of hearing is a menace to the miner underground, increasing his liability to accident. The tinnitus is rushing, hissing, or humming in character and makes the patient irritable, apprehensive, and suspicious.

In this type of inner ear disease vertigo is absent and no affection of the vestibular apparatus is found on examination.

Some case notes are given and the conclusion is drawn that the occupational deafness of miners is an inner ear disease brought about by two forms of irritation.

1. Sufficient but not overwhelming noise.
2. Constant vibration of the machinery having a cumulative effect which produces a result after a certain time.

Then follows an account of the technicalities of mining machinery.

C. DE W. GIBB.

The Reflex Arc for Vestibular Nystagmus in Man. A. DE KLEYN and V. SCHENK (Utrecht). (*Collegium Oto-Rhino-Laryngologicum*, 4th Annual Meeting. *Acta Oto-Laryngologica*, 1931, Vol. xv., fasc. 2-4.)

It has been shown experimentally in animals that vestibular nystagmus with slow and quick component can be excited:

- (a) After removal of the cerebrum.
- (b) After removal of the cerebellum.
- (c) After division of both trigeminal nerves and of the motor nerves to all the eye muscles with the exception of that to one external rectus.
- (d) After removal of the nuclei of the 3rd and 4th cranial nerves.
- (e) After transverse section of the medulla at a level just below the lower limit of the 8th nucleus.

Recently the writers have had the opportunity of testing the eye reflexes in an anencephalic infant which lived one week. A vestibular

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nystagmus with slow and quick component was elicited on both sides. By post-mortem examination it was found:—

- (a) The cerebrum was absent.
- (b) The cerebellum was absent.
- (c) In each eye there was only one muscle and the nerve supplying it—the external rectus.
- (d) The only oculo-motor nerve nuclei present were those of the 6th nerves.
- (e) The sensory epithelium of the labyrinth and the vestibular nerve and its nuclei were present on both sides.

This confirms the finding in animals, and proves that the reflex arc for vestibular nystagmus in man, as in other animals, consists of:—Peripheral labyrinth, vestibular nerve, vestibular nucleus, abducens nucleus, abducens nerve, and external rectus muscle.

G. WILKINSON.

The Resonance Pitch of Sea Shells. H. ZWAARDEMAKER and P. ROORDA (Utrecht). (*Collegium Oto-Rhino-Laryngologicum*, 4th Annual Meeting. *Acta Oto-Laryngologica*, 1931, Vol. xv., fasc. 2-4.)

The late Professor Zwaardemaker of Utrecht investigated the resonance tones of a number of sea shells. The idea underlying these investigations seems to have been that the cochlea, being in form exactly what its name implies—a snail shell—would have a resonance period determined by the same laws as those applying to spirally coiled hollow cavities generally, so that if the formula expressing the numerical relationship of the various factors could be found, that for the cochlea might be inferred, and that this might have a bearing on the theory of hearing. Zwaardemaker pointed out that the murmur heard when a sea shell is held to the ear is, in fact, the proper resonance tone of the shell, and is due to the reinforcement by resonance of the components of the same frequency present in the diffused noise by which we are constantly surrounded in daily life. In his “silence cabinet” no murmur from the shell could be heard. The resonance of the shell formed an admirable detector of noise of any kind.

Helmholtz established the formula for determining the natural frequency of his spherical resonators. This is given by dividing the fourth root of the area of the mouth of the resonator by the square root of the cubic capacity, and multiplying by a constant (52,400). It is stated in some text-books of physics that this constant holds good for all hollow resonators of whatever form. Zwaardemaker found that the maximum resonance frequency of sea shells was determined by the same factors, *i.e.*, the area of the mouth of the

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shell, and the cubic capacity, but that the constant was smaller than that for spherical resonators, and was different for different species of shells though always the same for one species, irrespective of size. The constant therefore depends on the form of the cavity of the shell. Thus, if the resonance frequency of an enlarged model of the cochlea were found by direct experiment, that of the natural cochlea could be worked out mathematically. Apparently this has not yet been done.

G. WILKINSON.

Correlation of the Density of Innervation of the Organ of Corti with Differences in Acuity of Hearing, including Evidence as to the Location in the Human Cochlea of the Receptors for certain Tones. S. R. GUILD, S. J. CROW, C. C. BUNCH, and L. M. POLVOGT (Baltimore, U.S.A.). (*Collegium Oto-Rhino-Laryngologicum*, 4th Annual Meeting. *Acta Oto-Laryngologica*, 1931, Vol. xv., fasc. 2-4.)

This research is based on the histological examination of about 1200 human temporal bones, for about one third of which there were records of the condition of hearing during life. Fifteen of the cases were selected for detailed examination. From these graphic records were made on standard skeleton diagrams, showing: (1) the approximate total number of ganglion cells in the spiral ganglion; (2) the average number of ganglion cells per mm. of length of the organ of Corti at various levels of the cochlea.

The total number of ganglion cells was found to range from 23,200 to 27,800 in young adults. The number in children was greater, averaging 29,000. The figures for each region of the cochlea were:—Lower basal, 934; upper basal, 1076; lower middle, 973; upper middle plus apical, 502. Thus the density of distribution of ganglion cells at the various levels of the cochlea corresponds roughly with the fineness of sound perception at the various levels of the tone scale, as measured by the audiometer, on the supposition that high tones are relegated to the basal, and low tones to the apical end.

In the ears in which there has been loss of hearing especially affecting the high pitched tones, the total number of ganglion cells was found to be diminished, the deficiency being about twice as great in the basal as in either of the other regions.

In one case of severe deafness the number of ganglion cells was reduced to 4437. On the other hand, where the deafness was of the middle ear type, the deficiency in the ganglion cells was not so marked as in cases with the same degree of deafness of the degenerative type.

A correlation of the ganglion cell count and the loss of hearing for different tones in a number of cases points to the following con-

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clusions:—Tones above 3000 d.v. affect the upper basal coil, and parts above it; tones of 4000 d.v. and higher affect the lower basal turn. In greater detail the following are the limits:—

Circa 4096 d.v.—upper end of lower basal coil (8 or 9 mm. from the extreme base).

Circa 8192 d.v.—middle and lower basal (5 mm. from basal extremity), above 8192 d.v.—lower fourth of basal coil.

These results may be compared with those obtained in the classical experiments of Wittmaack and of Yoshii, on the degenerations produced in the cochlea by prolonged tonal stimulation, which they strikingly confirm and extend. In both investigations the indications obtained are much clearer for higher tones, and the basal coil of the cochlea, than for the rest of the scale, but, in spite of this limitation, they concur in pointing to the existence of a series of pitch levels in the cochlea.

G. WILKINSON.

NOSE AND ACCESSORY SINUSES.

Factors Influencing the Development of the Nasal Accessory Sinuses. KARL GRAHE (Frankfurt a.M.). (*Collegium Oto-Rhino-Laryngologicum*, 4th Annual Meeting. *Acta Oto-Laryngologica*, 1931, Vol. xv., fasc. 2-4.)

Six young rabbits were deprived of their molar teeth on one side when they were six weeks old. Four months later the corresponding maxillary antrum was found to be underdeveloped. In another six rabbits the external naris on one side was sewn up. This was found not to have caused any abnormality of development in three cases in which the macerated skulls were examined later. In one case the nasal passages were tamponaded on the closed side, which caused profuse suppuration in the corresponding nasal fossa, and in one of the cases deprived of the molar teeth the same condition developed spontaneously. In both of these infected cases the nasal sinuses were found to be dilated on the affected side.

The inference is that the development of the maxillary antra depends principally on the growth of the alveolus induced by mastication pressure, and that the development of the nasal sinuses is but little affected by the presence of nasal obstruction.

G. WILKINSON.

Local Anæsthesia for the Radical Maxillary Operation. M. S. ERSNER, J. J. PRESSMAN, and W. ERSNER. (*Archives of Oto-Laryngology*, March 1931, Vol. xiii., No. 3.)

The technique of local anæsthesia for the radical maxillary operation is by no means standardised, and most of the methods

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are unsatisfactory. The following method of nerve block anaesthesia has given excellent results in 125 cases.

A hypodermic injection of scopolamine gr. $\frac{1}{100}$ and morphine gr. $\frac{1}{4}$ or $\frac{1}{8}$ is given two hours before the operation. A 2 per cent. solution of procaine hydrochloride, with a small quantity of epinephrine, is injected at the following sites :—

1. The infraorbital nerve, which is reached by entering the needle in the mucobuccal fold, between the first and second bicuspid, and carrying it upward for a distance of one inch.
2. The posterior superior branch of the maxillary nerve. The needle, inserted opposite the second molar tooth, passes upward, inward, and backward for one inch. The point of injection is close to the tuberosity of the maxilla.
3. The anterior incisor canal, through which the nasopalatine nerve reaches the hard palate, behind the central incisors.
4. The posterior palatine foramen, in a depression just medial to the third molar tooth. Here the palatine nerve reaches the posterior part of the hard palate.
5. The middle meatus. Owing to the difficulty of injecting the sphenopalatine ganglion and the possibility of ocular complications which may follow, it is convenient to block the branches of the nerve by injection of the lateral wall of the middle meatus.
6. The use of packing soaked in 10 per cent. cocaine, with epinephrine, introduced beneath the inferior turbinate and along the entire inferior meatus.

The writers claim that by using the above technique there is freedom from pain, a minimum of bleeding, no pain in adjacent structures, and little postoperative swelling. Only 2 or 3 c.c. of solution is required for the entire series of injections.

The paper is clearly illustrated by seven photographs.

DOUGLAS GUTHRIE.

New Files for the Intranasal Operation for Frontal Sinusitis. J. VAN DER HOEVEN-LEONHARD. (*Les Annales d'Oto-Laryngologie*, March 1931.)

The great majority of frontal sinus infections are acute or subacute and only rarely do they proceed to chronicity. When this latter condition is established, one must first have a stereo-radiograph taken. It will usually be observed that the frontal sinuses are very large. Inhalations and other conservative treatments will now have to be abandoned, and operative treatment substituted. Intranasal drainage is the method of choice. Many raspatories have been designed to meet the situation, but the author prefers to use instruments which

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are called and behave like files. Details are given to explain their design and their mode of action.

The author believes in frequent postoperative lavage.

M. VLASTO.

LARYNX.

Results of Stroboscopic Examination of the Larynx in 200 Singing Students. Prof. E. N. MALJUTIN (Moscow). (*Collegium Oto-Rhino-Laryngologicum*, 4th Annual Meeting. *Acta Oto-Laryngologica*, 1931, Vol. xv., fasc. 2-4.)

When the action of the larynx during singing is observed by the stroboscope in a number of patients, striking differences in the movements of the vocal cords are found in different individuals, and these are comparable to the differences seen in the action of the lips in ordinary conversation. The commonest irregularity is an unequal action of the vocal cords, and in the great majority of such cases it is the right cord which does most of the work. In 200 cases 50 per cent. showed a varying degree of weakness of action of the left cord. A defective quality of the singing voice was associated with this inequality of action.

That the preponderance of the right cord over the left is due to the predominance of the speech centre of the left hemisphere is shown by the fact that in the few cases in which the left cord was the more active, the subject was found to be left-handed. In some cases the inequality seemed to the author to indicate a weakness of the left recurrent nerve. In 5 per cent. of his subjects some dilatation of the heart or aorta was found in association with a weak left cord.

Over-use or exclusive use of the right cord is the rule in deaf-mutes. This is attributable to the fact that the preponderating action of the left cortical centre is not regulated by the subject hearing the faulty quality of the tone produced.

The author is of the opinion that teachers of singing are apt to pay attention too exclusively to breathing, and to neglect the consideration of the correct action of the larynx. He employs the method of "harmonic vibration" to bring the weaker cord into action. The method is not fully described, but apparently consists of applying a mechanical vibrator to the weak side of the larynx, whilst the patient vocalises a tone of the same frequency as that of the vibration of the apparatus.

G. WILKINSON.

Paralysis of the Vocal Cords. H. F. DAVIES. (*Archives of Oto-Laryngology*, March 1931, Vol. xiii., No. 3.)

This paper deals with 49 cases of paralysis of the vocal cord (or cords) due to interference with the nerve supply. In the series 27 were men, 22 were women, and the ages varied from the youngest,

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21 years, to the oldest, 73 years, 24 of the cases occurring during the age period 50 to 70 years.

In 5 cases both recurrent laryngeal nerves were involved, and in 44 only one side was affected. In those 44 cases, the left cord was affected in 27, the right in 17.

The Wassermann reaction was negative in 37 cases, positive in 2 cases. No report in 10 cases.

In the unilateral cases the impairment of voice ranged from "cracked" voice to absolute loss of voice, but in 8 cases the voice was normal.

Dyspnoea was present in 15 cases, and dysphagia in 6.

Investigation of the cause of the paralysis gave the following results. Eight cases were due to trauma during operations on the thyroid gland; 6 were the result of simple thyroid gland enlargement; 5 were associated with carcinoma of the thyroid gland; 4 with intrathoracic goitre; 4 with cardiac enlargement; 2 with aortic aneurysm; 7 with pulmonary tuberculosis, and other less frequent causes were X-ray treatment of thyroid gland, carcinoma of the breast, tumour of nasopharynx, and cerebral tumour (4th ventricle). In 6 cases no cause could be found.

The writer alleges that vocal cord paralysis is a rare complication of simple goitre. At the Cleveland Clinic the larynx was examined in 8000 cases of goitre, and only 6 cases showed laryngeal paralysis, an incidence of less than 0.1 per cent. Previous writers have stated the incidence as 10 per cent. (Waugh) and 6 per cent. (Barlow). In malignant disease of the thyroid gland, however, the incidence of laryngeal paralysis is about 10 per cent., and in intrathoracic goitre it is about 2 per cent.

DOUGLAS GUTHRIE.

A Case of Sarcoma of the Larynx (Vocal Cord) treated by Deep X-ray Therapy. No Recurrence after Five Years. V. TEXIER (Nantes). (*Les Annales d'Oto-Laryngologie*, February 1931.)

The patient was a man of 77 years of age. For five years his voice had lost its purity of tone, and for the last eighteen months he had become definitely hoarse. On the right vocal cord, in its anterior third, could be seen a small sessile growth. The cord was mobile. No glands felt. The growth was removed by the indirect method, and histologically proved to be a large spindle celled sarcoma. Deep X-ray therapy was carried out for seventeen hours in seventeen sittings, over a period of one month. Details of the technique are given. At the completion of treatment the patient's voice was nearly clear, and the author was struck with the absence of inflammatory reaction resulting from the treatment. The patient died five years later from some intestinal complaint.

M. VLASTO.

Pharynx

Remarks on the Operation of Tracheotomy. Technique of Professor Sébilleau. JONATHAN ELBAZ. (*Les Annales d'Oto-Laryngologie*, March 1931.)

It might reasonably be assumed that the technique of the operation of tracheotomy had become crystallised and settled, and that no useful purpose would be served by further enlarging on the subject. Nevertheless, there is a threefold reason for a further consideration of the subject. (*a*) Tracheotomy is an ever-present vital problem; (*b*) it is a classical example of an emergency operation, which has to be performed not only by the laryngologist but also by the practitioner; (*c*) it is a delicate proposition which is often dramatic and full of difficulties.

In this article, the author's remarks concern tracheotomy in adults, either as a preliminary to other operations or for the relief of progressive stenosis; he is not referring to emergency operations on children which have to be carried out by a special technique.

We are first given a dramatic account of a case of emergency tracheotomy to emphasise the difficulties that may be encountered. And after the operation, complications may ensue from the tube becoming dislodged. Sébilleau's technique described by the author has been designed to meet these difficulties and avoid them. (*a*) The skin incision and the division of the soft parts is very extensive from the upper border of the thyroid cartilage to the suprasternal notch. (*b*) Low tracheotomy is never performed. To do so is a surgical error. (*c*) The trachea is anchored to the neck, so that the opening is flush with the skin. The advantages of this course are that infection of the pretracheal cellular tissue is avoided, there is no possibility of making a false passage in inserting the tube, and the tube once inserted can be replaced with ease if expelled.

M. VLASTO.

PHARYNX.

The Direction of Invasion in Cancers of the Pharynx. Dr. LEDOUX (Brussels). (*Collegium Oto-Rhino-Laryngologicum*, 4th Annual Meeting. *Acta Oto-Laryngologica*, 1931, Vol. xv., fasc. 2-4.)

Whatever the situation of the primary growth, its first extension takes place along the course of the lymphatics to the associated glands, and as an infiltration of the lymphatic spaces ("a neoplastic lymphangitis"). Eventually the primary lymphatic channels are blocked, and a retrograde infiltration then takes place towards the arch of the palate and the side of the tongue. As soon as this infiltration reaches the middle line in either situation infiltration in

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the direct lymphatic stream on the opposite side occurs, and is manifested by an enlargement of lymphatic glands on that side.

G. WILKINSON.

Anatomical Researches on the connections between the Prestyloid and the Submaxillary Spaces. Remarks on the extension of Certain Peritonsillar Abscesses, to the Submaxillary Space. A. VIÉLA and M. ESCAT. (*Les Annales d'Oto-Laryngologie*, February 1931.)

A detailed account is given of a case in Escat's practice in which the day after drainage of a peritonsillar abscess through the mouth, a phlegmonous swelling appeared below the angle of the jaw. At first the surgeon thought he was dealing with a glandular reaction, but very soon this swelling tended to subside and was followed by a large submaxillary and submental swelling which involved the floor of the mouth. Pus was evacuated from this swelling and, after a fairly severe secondary hæmorrhage, the patient recovered.

The rapidity with which pus collected in the submaxillary region led the author to study the anatomy of the affected regions, and particularly to see if an area of weak resistance between the prestyloid and the submaxillary spaces existed. Hitherto it had been generally accepted that these spaces were shut off by the insertions of the styloglossus into the tongue and of the stylopharyngeus into the capsule of the tonsil. The author's anatomical researches are described with diagrams and his conclusions are as follows: (1) The prestyloid space is not closed below. It communicates with the submaxillary space through a potential opening situated between the outer surface of the styloglossus and the inner surface of the internal pterygoid muscle. (2) The appreciation of the existence of this point of least resistance explains why sometimes a peritonsillar abscess, although previously drained into the oropharynx, is liable to become complicated by a direct extension into the submaxillary space on the affected side.

M. VLASTO.

MISCELLANEOUS.

Non-leukæmic Lymphadenoses, with extensive changes in the Pharynx, Larynx, and Eyes. G. THEISSING (Bonn). (*Zeitschrift für Hals-, Nasen- und Ohrenheilkunde*, Band xxviii., Part 2, p. 146.)

The text for the article is afforded by a special case. This was that of a woman aged 64, who, for one and a half years, suffered from slowly increasing deafness and slight difficulty in swallowing. On account of the suspicion of carcinoma of the tonsil and larynx she was sent into the hospital, a biopsy was not made and the patient

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disappeared, but a few months later returned on account of intermittent dyspnoea of about an hour's duration, which became more and more severe. Seven months after first being seen the patient was again brought into hospital in a very poor general condition and complaining of a high degree of dyspnoea and dysphagia. There was then found in the upper air passages, together with a moderate degree of turgescence of the nasal mucous membrane, a tumour-like swelling and bluish discoloration of the left tonsil; the right tonsil was also distinctly enlarged. The left lateral band was swollen on the one side as far as the roof of the pharynx, and on the other side to the left vallecula. The soft palate presented very striking alteration in the shape of pale yellow infiltration on each side of the middle line; the epiglottis was pushed to the right by the tumour so that inspection of the interior of the larynx was extremely difficult. There was seen a tumour-like infiltration of the right ventricular band by which the right vocal cord was completely hidden. The left vocal cord and ventricular band were normal. Both sides moved on phonation but the voice was quite toneless. At the left angle of the jaw there was a glandular swelling the size of a pigeon's egg, which was not attached to the surrounding tissues; there were small cervical and occipital glandular swellings on both sides, also in the left supraclavicular fossa. Examination of the rest of the body revealed a glandular swelling, the size of a bean, in the axilla and enlarged inguinal glands on both sides. The thorax was moderately wide and well-developed. The heart's action was rapid and at times irregular, the lungs apparently normal on auscultation and percussion. On X-ray examination there were no shadows corresponding to any special group of glands. In the posterior mediastinum at the level of the left auricle there was an area of dullness. There was no enlargement of the spleen or of the liver. There were in both eyes tumour-like growths under the smooth conjunctiva. The leucocyte count showed:—leucocytes, 7000, polymorphs, 58 per cent., large lymphocytes, 20 per cent., small lymphocytes, 10 per cent., eosinophiles, 2 per cent., monocytes, 10 per cent. Histological examination of the gland at the angle of the jaw showed a tumour consisting of round cells. The tissue structure of the lymphatic gland had completely disappeared. Round cells were in close contact with each other; they showed numerous mitoses and had the character of lymphocytes. With them were a few cells, a small nucleus and extensive protoplasm. In this case Röntgen radiation had a remarkably favourable effect, and there was ultimately a complete disappearance of the infiltration in the pharynx and larynx, all illustrating the beneficial effect of Röntgen therapy on lymphomatous tumours of the upper air passages in non-leukæmic lymphadenoses.

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