

ABSTRACTS

EAR.

The Sensitivity of Normal and Defective Ears for Tones of Various Frequencies. JOHN P. MINTON and J. GORDON WILSON. (*Proceedings of the Institute of Medicine of Chicago, 1921.*)

In this communication the writers summarise briefly the results they have obtained by testing the hearing of normal and defective ears with a new instrument, the "Audion Oscillator." In this instrument harmonic vibrations are set up in the discs of a telephone receiver by means of a "sine wave" current. The pitch can be varied for 100 to 5000 D.V. and the intensity controlled by a variable resistance. It is claimed that accurate comparison of the energy of the vibrations of different frequencies can thus be made, and the sensitiveness of perception estimated on an absolute standard; a highly desirable consummation, if attainable.

The results of the tests are rather startling. Two curves of relative minimal sensibility for normal-hearing individuals are given. They both show most extraordinary peaks at about 4000 to 2000 D.V., and in one case also a lesser peak at about 1000. It is difficult to see any functional significance in these very limited exaltations. The lower (1000) rise does not include the whole range of tones for speech, nor does the middle (2000) rise cover the range of characteristic upper partials of vowel sounds, whilst the upper and most marked rise lies above the range of the more useful tones. The authors assure us that they are not the result of resonance with the receiver, or in the air between the receiver and the ear. It is not, however, clear that the upper (4000 D.V.) rise is anything but "the unpleasant shrill note" which Helmholtz found in his own case about f''' , which is due to the reinforcement of that tone by the resonance of the column of air in the external meatus. The middle and lower rises in the curves are approximately the lower octaves of this note. It is rather difficult to suggest an explanation for them. The four curves given present a very intermittent character, the acuity of hearing being markedly depressed in sharply localised regions within the scale.

The conclusions drawn from them may be summarised as follows:— Tone perception must be carried out in the cochlea by special receptors arranged lineally in series, and there is a corresponding serial arrangement of nerve fibres distributed to these receptors. No doubt the authors' results do lend some support to their contention so far as they go.

GEORGE WILKINSON.

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The Caloric Excitability of the Labyrinth. BRUNO GRIESSMANN.
(*Münchener Medizinische Wochenschrift*, Nr. 51, 68 Jahr.)

A number of experiments carried out by Griessmann upon people with normal labyrinthine excitability prove the existence of a sympathetic connection between the skin and the vestibular apparatus. They demonstrate further that the labyrinth may be regarded as a nerve apparatus possessing a very marked sensibility to heat and cold, and that the caloric reactions of the labyrinth may rather be attributed to this fact than to the secondary vasomotor (and lymph) phenomena put forward by Bárány and Kobrak.

The usual caloric reactions were obtained in a few seconds without any syringing, simply by inserting in the auditory meatus a piece of lint soaked in water at the required temperature, and, what was still more remarkable, by the placing of the hot or cold lint on the auricle or on the skin of the neck below the auricle. JAMES B. HORGAN.

A New Vestibular Reaction. ERNEST WODAK and MAX. HEINREICH FISHER. (*Münchener Medizinische Wochenschrift*, Nr. 6, Jahr. 69.)

The reaction is termed by the authors the Arm Tone Reaction, or for the sake of brevity A.T.R. It depends upon the fact that if the vestibular apparatus of a normal individual is in any way stimulated, as, for example, by syringing with water, there occurs an alternation in the subjective feeling of weight (*schweremfindung*) on the two sides of the body. This sensation arises during or soon after the cessation of syringing, according to the amount and temperature of the water used. One side of the body appears to become heavier and to sink down whilst the other seems to become lighter and more elevated, these sensations being more pronounced in the extremities. If now the individual be asked to close his eyes and to extend both arms horizontally before him, preferably in the position of pronation, it will be observed that the arm on the subjectively heavier side sinks whilst the converse applies to its fellow. The actual difference between the positions assumed by the arms is very different in individual cases and fluctuates between some centimetres and several decimetres.

The reaction is more evident in children and women, and endures from between fifteen to thirty minutes. During this time there often occurs a reversal, both subjective and objective, in that the arm which at first felt the heavier now becomes the lighter and rises, and that which was formerly the lighter becomes the heavier and sinks. This occurs with greater frequency if warm water be used. It does not follow that there is a complete reversal of the positions of the arms.

The reaction is subject to certain rules. If cold water is used the sinking is in the first instance on the syringed side, and if warm water

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be used the reverse. The phenomenon is also observed after stimulation by rotation and galvanisation, in which cases it is also subject to specific rules.

The authors allude to the relationship which exists between A.T.R. and the other known vestibular reactions, and enumerate some of the ways in which it should prove of practical importance. It could, for instance, be used to estimate differences in the functional activity of the two labyrinths. Owing to the length of time which it lasts the reaction can be sought for without further disturbing the patient after he has been examined for the usual labyrinth reactions. The reaction, being a very fine one, may be observed in cases in which neither spontaneous nystagmus nor spontaneous past-pointing exists and in which vertigo is the only symptom present.

Simulation can be excluded in carrying out the A.T.R., owing to the ignorance of the person examined of the fact that the lowering of one arm is accompanied by a simultaneous elevation of the other and that there are periodic reversals of the deviations.

The authors request that the A.T.R. should be given ample clinical trial so that the results of their initial investigations may be confirmed and elaborated. They have little or no doubt that in many cases its practical utility will be convincingly established.

JAMES B. HORGAN.

Observations, Clinical and Theoretical, on Railway Nystagmus.

R. BÁRÁNY. (*Acta Oto-Laryngologica*, Vol. iii., fasc. 3.)

The author evokes railway nystagmus by turning before the eyes of the patient a roller marked with black lines. He finds that in hemianopsia railway nystagmus towards the side of the hemianopsia fails to appear, while towards the opposite side it is obtained as usual. Its absence towards the side of the hemianopsia is due to the fact that at the instant when the first line disappears, the image of the second is projected on the blind area, and hence no movement of the eyes takes place.

In cases of spontaneous horizontal optical nystagmus due to defective vision, railway nystagmus could not be obtained in the direction of the spontaneous nystagmus. In some cases, indeed, it was found that in place of the expected railway nystagmus there appeared a nystagmus in the opposite direction, even when spontaneous nystagmus in the direction of the expected railway nystagmus was already present.

Railway nystagmus is the result of three impulses: (1) the fixation impulse; (2) the impulse to follow moving objects; (3) the rebound of the eye to fix the next object. The nystagmus appears to originate from the calcarine fissure, but not directly, as certain of the author's

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observations seem to indicate that the slow phase takes origin in the angular gyrus, and the quick phase in the frontal region.

Railway nystagmus is present a few hours after birth, and this suggests that nerve fibres are capable of functioning before they have become medullated.

THOMAS GUTHRIE.

The Relation of Labyrinthine Tonus to Muscle Tonus. J. GORDON WILSON, M.D., Chicago. (*Journ. Amer. Med. Assoc.*, Vol. lxxviii., pp. 557, 562, 25th February 1922.)

The author reaches the following conclusions :—

1. Tonus is a plastic state of the muscle associated with the maintenance of normal attitude. (Postural tonus of Sherrington.)

2. This state is under the control of reflex nerve impulses, which automatically produce a modification of the muscle to maintain a particular attitude.

3. One source from which these reflex nerve impulses arise is the labyrinth.

4. These reflex nerve impulses, determining the amount of muscle lengthening and shortening, together with the degree of fixation, depend on antigravity impulses arising in the labyrinth.

5. The labyrinth is chiefly concerned with the maintenance of the attitude of the head in space. As a corollary, the labyrinth influences secondarily the muscles of the trunk and limbs.

6. The muscle proprioceptors are concerned with segmental posture. The labyrinth is concerned with total posture. So far as trunk and limb are concerned the labyrinth may be regarded as a mechanism superimposed on the segmental.

7. In the unilateral destruction of the labyrinth, the deviation of the eyes and neck is due to tonic activity of the other labyrinth.

8. The stimulation of the nerves in the labyrinth is due to mass movements of the otoliths and fluids in the canals.

The article provides an interesting survey of recent investigations, and should assist our knowledge of the very intricate and subtle physiology, pathology, and clinical application of the vestibular reflexes.

It is particularly gratifying to note that the work of Sherrington is as well recognised in America as it is by those in Utrecht who conduct research on the functions of the Otoliths.

ALEX. R. TWEEDIE.

Inversion of the Oculo-Cardiac Reflex in Cerebral Compression. Dr JEAN GIROU. (*Revue de Laryngologie, etc.*, December 1921.)

The oculo-cardiac reflex is elicited by firm compression of the eyeballs backwards in the orbits. In normal individuals this produces an immediate slowing of the cardiac rhythm, amounting to 6 or 8 beats

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a minute. The slowing ceases immediately the compression is discontinued. The afferent path is in the trigeminal nerve; its efferent path is in the autotonic fibres of the vagus.

Several observers have noted inversion of the reflex (*i.e.* quickening instead of slowing of pulse) in cases of head injury. The writer reports three observations on cases of cerebral suppuration (2 cerebellar, 1 extradural abscess of middle fossa) in which a similar inversion of the reflex was found.

In one case the pulse rate was 40 and rose to 108 on compression of the eyeballs. Girou observed this case during an operation for evacuation of cerebellar abscess. During the emptying of the abscess the pulse rose to 70 and reflexly to 76. Shortly after, the pulse rate was still 70, but no acceleration resulted from compression of the eyes. After the operation the reflex became normal (80 and 60 respectively). Possibly this inversion of the reflex may prove a valuable addition to our diagnostic resources in cases of suspected abscess of the brain.

The explanation given by the author is as follows:—Normally the afferent impulse passes by the 5th nerve through the brain to the vagus. When cerebral tension is raised, the efferent path is blocked by those impulses from the brain which give rise to tachycardia, and the reflex efferent impulse is switched over to the sympathetic route, causing an increase of the pulse rate.

G. WILKINSON.

Contributions to the Study of Psychoneuroses in Oto-Rhino-Laryngology.

Drs J. MOURET and CAZEJUST, Montpellier. (*L'Oto-Rhino-Laryngologie Internationale*, January 1922.)

1. *Facial Paralysis of Hysterical Origin.*—A female acrobat of 19, in the course of her performance, fell on the road, sustaining abrasions on her right arm and leg. She complained also of severe pain in her right ear. She had slight headache the same night, and the next day she presented herself at the ear clinic for examination. Save for slight ecchymosis in the postero-inferior quadrant of the tympanic membrane, the auditory apparatus was healthy and of normal appearance. She remained under observation for four days, during which time nothing occurred which was worthy of note.

The patient left hospital and soon afterwards met a person who expressed astonishment that she had not sustained facial paralysis as the result of her accident, enumerating, at the same time, the signs and inconveniences of this condition. In less than an hour after this conversation, the patient suddenly acquired a right-sided facial paralysis, which lasted for four or five days without improvement. She returned to the hospital, where examination with the aid of the electric current revealed the integrity of all branches of the facial

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nerve. Two treatments with faradism and one by suggestion resulted in a complete cure.

2. *Hysterical Mutism after Cauterisation of the Tonsil.*—The patient, a man of 28, was admitted to hospital for treatment of septic tonsils. He refused enucleation on account of the post-operative hæmorrhage, and some sittings by the galvano-cautery were arranged instead. Accordingly, under cocaine anæsthesia, the right tonsil was cauterised, the patient showing no nervousness at the time of operation. Four hours later, the nurse found him talking excitedly at the pitch of his voice to his neighbours. She ordered quiet, suggesting that he might bring on a serious hæmorrhage. He became quiet at once, and three hours later he found that he was quite unable to articulate or make a sound. Examination revealed slight œdema of the soft palate due to the cautery, and the vocal cords were found to be in the cadaveric position. The patient was informed that the condition was common after this operation, and that he would regain his voice before the morning. At 11 P.M., he was given milk which was designedly overheated, but this did not induce speech. Later on, however, the voice returned and was found to possess its normal tone. The patient submitted to two more sittings of the galvano-cautery without any untoward result.

GAVIN YOUNG.

LARYNX.

Surgical Anatomy of the Superior Laryngeal Nerve. Dr PAUL CAZEJUST. (*Revue de Laryngologie*, January 1922.)

The nerve is attacked in the “thyro-hyoid quadrilateral” when it is necessary to divide it, or to destroy its conductivity by alcohol injection in cases of intolerably painful dysphagia.

This quadrilateral space is bounded in front by the thyro-hyoid muscle, above by the great cornu of the hyoid bone, below by the upper border of the thyroid cartilage, and behind by the lateral thyro-hyoid ligament.

The writer, as a result of thirty dissections, shows that the course and relations of the nerve are subject to many variations. It is rare that the nerve presents itself under two identical aspects. Frequently the nerve makes a decided downward curve at the bottom of the thyro-hyoid space. Its relations to the superior thyroid vessels are not constant. It is usually at the inner side of the vessels, but occasionally crosses from within, below and finally above them. Sometimes it interlaces with them. The great cornu of the hyoid forms no reliable guide to the position of the nerve. Frequently the nerve divides into two collaterals before entering the membrane.

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These variations would account for the frequent failure of alcohol injections to hit off the nerve and interrupt its conductivity.

G. WILKINSON.

Thrush of the Larynx. LANGER, E. (Berlin). (*Arch. für Laryngol.*, 1921, Band 34, Heft 2-3.)

An ill-nourished infant, reported to have had an aphthous stomatitis with staphylococci but no thrush organisms (the term *Oidium Albicans* is not used, J.D.G.), began to run at the nose and cough, and died in a day or two with rapidly increasing difficulty in breathing. On post-mortem examination there was no sign of aphthous stomatitis, but on the middle of the inner segment of both vocal cords a white, fairly loose membranous exudation. The deposit contained quantities of gram-positive mycelial threads and conidia, and was evidently of the nature of thrush. The writer considers that the thrush had not developed primarily on the vocal cords, but had found its way there by "implantation-metastasis." The amount of erosion of the underlying epithelium was unusual. It is noted that thrush does not readily develop on ciliated epithelium unless that epithelium has become flattened by metaplasia. In this case the thrush seems to have selected the portion of the larynx furnished with squamous epithelium.

JAMES DUNDAS-GRANT.

Papilloma of the Larynx in Children. S. J. CROWE and M. L. BERNSTEIN. (*Archives of Surgery*, March 1922.)

Papilloma of the larynx in children, a disease as fatal as carcinoma of the larynx in adults, is fortunately not common. At Manhattan Eye, Ear, and Throat Hospital only eight cases were seen in fifteen years, and at Johns Hopkins Hospital only eleven cases in ten years.

The eleven cases just mentioned are fully reported in the present paper. The writers consider that an external operation is never justifiable in a child, as stenosis of the larynx is almost sure to follow. Tracheotomy is in most cases essential as a preliminary to further treatment. Cure following tracheotomy alone is rare, and is even denied by some authorities. Endo-laryngeal removal is the operation of choice, but the tendency to recurrence is well recognised, and repeated removals are necessary in order to effect a cure. The suspension apparatus is of great assistance.

After removal, various applications have been recommended, and diathermy has its advocates. Radium, in expert hands, is of undoubted value.

The case records accompanying this paper deserve careful study.

DOUGLAS GUTHRIE.

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Surgical Treatment of Functional Stenosis of the Larynx. SARGNON and J. TOUBERT. (*Annales des Maladies de l'Oreille, du Larynx, du Nez, et du Pharynx*, Vol. xl., No. 2.)

The authors in their papers deal with what they term "Functional Stenosis," and under this heading include cases of stenosis due to paralysis and those resulting from arthritis of the crico-arytenoid joint. As Escat said:—"The larynx may become inert as a result of neuropathy, myopathy, or arthropathy." As treatment, Sargnon advises laryngostomy, *i.e.*, suturing the larynx to the skin. Other methods are retrograde dilatation, resection of the superior laryngeal nerves, excision or incision of the vocal cords, arytenoidectomy. Hobday and Williams's operation of ventriculectomy as practised on horses is mentioned.

The authors' operation consists of a laryngostomy with a submucous resection of the two arytenoids and curettage of the two ventricles. The technique is as follows:—(a) Preliminary tracheotomy. (b) 1 per cent. novocain anæsthesia (local and regional) of the superior laryngeal nerves and of the larynx after exposure. Morphia before the operation. (c) Incision—from hyoid bone to lower border of thyroid cartilage. The edges of the endolaryngeal mucous membrane are sutured to the skin. (d) A single horseshoe-shaped incision is made just above the true vocal cords. (e) The arytenoids are separated and removed submucously, the vocal process being left intact. Then the intraventricular mucous membrane is stripped and cut flush with the margin. The ventricles may be curetted, and the cautery used to destroy any remnant tags. (f) The tracheotomy tube is left *in situ*, and the larynx packed for the first few days. Later, gradual dilatation is maintained by a drainage tube increasing in calibre. (g) The tracheotomy tube is removed later, and the wound allowed to heal. It may be necessary to do a plastic operation.

The advantages claimed for the method are as follows:—1. The vocal cords are left intact—their separation is effected by the cicatricial contraction of the ventriculectomy wound. 2. The enlargement of the larynx is in all diameters equal. 3. It is superior to laryngostomy followed by dilatation, because it allows one to dilate the larynx in which the mucous membrane is more or less intact and free from cicatrices. 4. Breathing and the voice are recovered at an earlier stage and more satisfactorily.

E. D. DALZIEL DICKSON.