

## EAR.

**Aderman** (Orebro).—*The Masto-squamosal Suture*. "Arch. of Otol.," vol. xxxii., No. 2.

He calls the suture "distinct" when it appears like an ordinary suture of the cranial bones, though it may have disappeared at a number of points. It is "unusually well developed" if the two bony surfaces are completely divided by a long suture. When it is represented by small apertures, usually in the middle of the mastoid process, it is described as a "trace." He examined 2,554 skulls, and found that of 5,138 mastoid processes, 1,806 had sutures. Of these, 64 were well developed, 845 were easily recognisable, and 951 presented traces; of those with distinct sutures, 9 were children's and 3 those of old people.

*Dundas Grant.*

**Bonnier, Pierre**.—*On a New Bulbar Symptom-Complex*. "La Presse Méd.," February 18, 1903.

The following group of symptoms, referred by the author to the nucleus of Deiters, is of very frequent occurrence—viz., vertigo, with complete or partial derangement (*dérobement*) of the apparatus of equilibrium, with reflex oculo-motor disorders; nausea and a state of anxiety; passing auditory phenomena; and painful affections of certain areas supplied by the trigeminal nerves. This syndrome unites to certain cerebellar manifestations the reactions proper to the third, fourth, fifth, sixth, eighth, ninth, and tenth pairs of cranial nerves. As in all symptom-complexes, each element may be present in greater or less intensity, or, indeed, some elements may be absent. The essential elements are the vertigo, loss of equilibrium, and oculo-motor disorders. Clinically, we meet with this syndrome in connection with peripheral ear disease, as we do the syndrome of Ménière, and this is easily explained by the fact that Deiters' nucleus is essentially a labyrinthine centre. We also find it in what the author calls the labyrinthine phase or form of tabes, characterized by tinnitus, deafness, vertigo, derangement of the apparatus of equilibration, Romberg's sign, insecurity in standing or walking in the dark, reflex oculo-motor disorders; in short, characterized by all the signs that indicate that the tabetic process has invaded the largest and most active of the posterior spinal roots—viz., the eighth pair of nerves. Lastly, we often find this syndrome complete or incomplete in the bulbar lesions of several general diseases, specially in cases where a bulbar lesion already exists at the level of the pneumogastric centres—*e.g.*, in the state of syncopal anxiety, with slow pulse, in the various terrors of asthma, in angina pectoris, etc.

The individual symptoms constituting the complex are:

1. *Vertigo*.—The nucleus of Deiters is, before all and above all else, the nucleus of the labyrinthine or eighth nerve, and this nerve is properly to be regarded as the largest and most active of the posterior spinal roots. Now, a posterior spinal root consists of two sets of fibres: (*a*) The delicate external set ending in the apices of the posterior cornua, and conveying impressions of external objective relations—*i.e.*, cutaneous perceptions of pressure, contact, heat. In the eighth nerve the corresponding fibres form the cochlear nerve, ending in the prolongation (in the bulb) of the apices of the posterior cornua—

viz., the anterior nucleus and the acoustic tubercle. They, too, carry external objective tactile impressions, which have become auditory. (b) The coarse internal set, ending at the base of the posterior cornua in the subependymal region and columns of Clarke, and conveying impressions of the so-called muscular sense (really information of posture or attitude) to the motor centres in the medulla, to the cerebellum, and to the cerebral cortex. These are impressions of an internal touch-sense, and give that information as to segmental postures which is indispensable for proper movement, and specially for equilibration. In the labyrinthine nerve the corresponding fibres constitute the vestibular root, ending in the bulb in the subependymal region (the prolongation of the base of the posterior cornua), the internal nucleus and nucleus of Bechterev, and in the nucleus of Deiters (the prolongation of the column of Clarke). This root conveys impressions of posture of the cephalic segment, and of the body as a whole, to the bulbar motor centres, to the cerebellum, and to the cerebral cortex. This, again, is a subjective sense of internal touch—viz., the tactile impressions of the semicircular canals. The eighth nerve, therefore, corresponds exactly to any spinal posterior root nerve anatomically, physiologically, and pathologically (witness the frequency with which it is attacked by tabes). Vertigo is the first reaction of Deiters' nucleus, and it may appear in any of the forms known to us clinically; and, like all nuclear phenomena, it may or may not be represented in consciousness.

2. *Ataxy (Dérobement)*.—Deiters' nucleus and the cerebellum are intimately connected with one another by ascending and descending fibres. It is through the nucleus of Deiters that a lesion of the cerebellum manifests itself in oculo-motor disorders, and conversely it is through the cerebellum that the nucleus exerts its influence on muscular tonus. Whatever is true of the column of Clarke and its relations to the posterior spinal roots on the one hand and to the cerebellum on the other, is equally true of the nucleus of Deiters, with this difference: that whereas the spinal medullary apparatus regulates segmental postures, the vestibular apparatus regulates posture of the head and of the body as a whole. Therefore, failure of the vestibular centres produces not a mere local, but a total, ataxy—i.e., derangement (*dérobement*) of a whole division (*toute une partie*) of the apparatus of equilibration, causing falling on one side, gyration, etc. The cerebellum is informed through the Clarke-Deiters' nuclear apparatus (spinal and vestibular) of postures of the body, both segmental and total, and it then sets free the appropriate impulses to the appropriate muscles to maintain or to vary these attitudes (Luciani, Ewald, A. Thomas). A most important object of this cerebellar function is obviously the maintenance of equilibrium, in which it is clear that the information given by the vestibular centres is vastly more important than that given by the spinal medullary centres. Further, these impressions of posture are conveyed to the cerebral cortex, giving rise there to conscious "tonus images." The cerebrum knows these postures and orders movements in gross, but the cerebellum knows and arranges the details. If the cerebellum fails, then the cerebrum, aided by vision, can still regulate posture and maintain conscious equilibration: even without vision there is no Romberg's sign. But in the absence of spino-vestibular, and specially of vestibular, information, Romberg's sign at once appears, for, information through vision being shut off, and no information arriving from the cerebellum—which, indeed, has

none to send, having received none from the vestibular centres—the cerebrum has neither objective nor subjective basis of operation.

3. *Oculo-Motor Disorders*.—The nucleus of Deiters is intimately connected with the nucleus of the sixth nerve on the same side and that of the third nerve on the opposite side, perhaps also on the same side, so that all varieties of oculo-motor disorders may be seen, and are seen, arising from an aural lesion.<sup>1</sup> All experiments on the ear,<sup>2</sup> all therapeutic or other interventions,<sup>3</sup> and all grave or benign diseases of the ear, have produced oculo-motor disorders—the same disorders as one finds, whether passing or permanent, in the labyrinthine stage of tabes. The relations between movements of the eye and vestibular function are so intimate that Delage, after experimenting on the semi-circular canals, concluded that the vestibular apparatus was first of all an organ for the regulation of movements of the eye; therefore Mendel, in regarding the ocular disorders as of primary importance in the causation of vertigo, was wrong, mistaking cause for effect. Simple paralysis of the sixth nerve on the same side as the affected ear is the most common ocular affection, producing ordinary diplopia. Again, we find paralytic trembling of the external rectus, conjugate deviations of the eyes, nystagmus, exaggerated oscillations of the globes on voluntary movement, myosis, mydriasis, etc., all arising from disease of the ear. At the moment of occurrence of an attack of vertigo, oculo-motor disturbances are the rule. Further, it should be noted that, just as vertigo gives rise to diplopia, so also diplopia, or attempts to correct the same, give rise to vertigo.

4. *Nausea, Anxiety, etc.*—The connections of the nucleus of Deiters with those of the ninth and tenth nerves account for the nausea, vomiting, state of anxiety, and for respiratory, circulatory, secretory, and thermic disorders.

5. *Disorders of Hearing*.—Certain fibres of the auditory root (cochlear nerve), passing behind the restiform body, reach the nucleus of Deiters (Monakow, Held), and perhaps account for tinnitus and persistent deafness, which one might be tempted to attribute to a peripheral lesion.

6. *Painful Symptoms*.—Probst has shown that the nucleus of Deiters also receives certain collaterals of the sensory root of the fifth nerve. This explains the temporal pain often present in certain oculo-motor paralyses, etc.

After citing a few illustrative cases, Bonnier concludes his paper with some general considerations on nuclear (bulbar) pathology, of which one may here be quoted: "Vertigo, whether arising from the stomach, the eye, the ear, or from any internuclear radiation whatsoever, is the proper reaction of the nucleus of Deiters; and if the latter seems at times to react unreasonably, it is probably because it has been prepared by some disease (peripheral) of the ear, which often passes unnoted."

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<sup>1</sup> On this point see Bonnier, "Vertige" (1893); "Reflexes Auriculaire" (1894); *Note à la Société de Biologie and Revue Neurologique* (May and December, 1895); "Tabes Labyrinthique" (June, 1896, and March, 1899); also his works on "L'Oreille." Also Laurens, "Thèse," 1897.

<sup>2</sup> Cyon, Baginsky, Högyes, Lewall and Bonnier on Fishes, Delage, etc.

<sup>3</sup> Cases by Keller, De Boerne Bettmann, Styx, Urbantschitsch, Schwabach, Pflüger, Deleau, Kipp, Burekner, Moos, Jansen, Michael Cohn, Gellé, Verdos, and Bonnier.

**Jackson, Chevalier.**—*Notes on the Radical Mastoid Operation.* "Annals of Otology, Rhinology, and Laryngology," November, 1902.

The writer ascribes failure in this operation mainly to three causes : (1) Imperfect eradication of morbid tissue ; (2) insufficient care in the after-treatment ; (3) a closed retro-auricular wound with stenosed meatus. With regard to the removal of diseased tissue, he insists on the importance of following up and ablating every particle.

To insure an adequate meatus by the flap methods of Panse, Körner, and Stacke, he considers the mutilation of the concha, which must inevitably follow, objectional from a cosmetic point of view, especially so in ladies, who would rather tolerate a scar, which can be easily hidden by the hair, than the slightest deviation from the normal in the concha. Another objection raised is the occasional complication of perichondritis, with its resulting shrinkage and deformity. He therefore prefers a method of operation which has for its object the grafting of the exenterated cavity with two flaps derived from tissue immediately abutting on the auricle behind, without interference with the membranous meatus, which, save for the punching out of a notch to be presently described, forms the anterior wall of the post-auricular wound.

The steps of the operation are as follows : (a) The ossicles and membrane, or what remains of them, are removed through the meatus. (b) A curved incision is made in the usual manner 1 centimetre behind the pinna, starting just posterior to the temporal artery, so as to allow ample retraction of the flap downwards and forwards. (c) The mastoid cells, antrum and tympanum are rendered one continuous cavity. The meatus is neither split nor excised, but a notch is punched out with Myles' ethmoidal forceps to such an extent as to procure an easy exit between the wound cavity and tympanum in the early stages of healing. By adopting such a course the writer considers there is less tendency to the production of fibrous tissue about the fenestra vestibuli. The mastoid cells and outer attic wall are freely removed whether diseased or not, and the cortex is chiselled away as freely as possible, so as to obtain a large orifice with a gradual slope down to the seat of the antrum. (d) The skin flaps for grafting the cavity are fashioned out of tissue intervening between the first incision and the auricle ; by making an incision close to the latter and about the same length as the first, a crescentic band is thus formed, attached above and below, but free elsewhere. This is divided transversely about its centre, and the two resultant flaps are then tamponed into the cavity against the upper and lower walls respectively. This grafting can either be done at the time of the operation or subsequently.

The after-treatment is not detailed by the writer, but, to use nearly his own words, he says the retro-auricular wound heals from the bottom, and is allowed to close, or is closed, only after the wound cavity, including the antrum, is filled and covered with a thick layer of fibrous tissue, obliterating everything except the newly enlarged and sloped tympanic wall. This cavity is not covered with true skin, but with cornified mucous membrane, and is situated at the fundus of a normal auditory canal ; this, the author thinks, affords some explanation for the improvement in audition attending his cases.

As to instruments, whilst fully appreciating the motor burr, especially from the point of view of its leaving a smooth surface where diseased spots are easily discernible, he deprecates its use on account

of the difficulty attending its sterilization, much preferring a chisel with rounded basil and corners and straight edge. *H. Clayton Fox.*

**Kamm, M.** (Breslau).—*Acute Mastoiditis complicated by Scleroderma.* "Arch. of Otol.," vol. xxxii., No. 2.

In a case of acute mastoiditis a swelling extending downwards below the mastoid process suggested that the case was one of "Bezold's mastoiditis." On further examination, however, there was found the board-like skin of scleroderma, of which the patient was the subject. The only difference that this condition made on the operation was that there was marked venous hæmorrhage from the wound.

*Dundas Grant.*

**Ledoux.**—*A Case of Otitic Meningitis with Cyto-diagnosis.* "La Presse Oto-Laryngologique Belge," March, 1902.

A boy, aged fourteen, was admitted to the hospital with a retro-auricular abscess, opened some days earlier, complicating an otorrhœa. The ear affection began insidiously eight years before, without pain, merely as a slight discharge accompanied by impairment of hearing. At the operation a fistula was found behind the meatus, leading to the antrum. From it exuded caseating pus. There was extensive caries of the mastoid, extending backwards to the meninges and the lateral sinus, which were laid bare to the extent of about a square centimetre. The external walls of the aditus and the attic were also affected, as well as the Fallopian canal.

During the procedure the face twitched several times. After the operation slight facial paralysis appeared, which became almost complete some days later.

At the first dressing, on the fourth day, there was marked fœtor, and a drop of fœtid pus appeared where the dura was exposed.

On two occasions subsequently it was necessary to remove more bone on account of caries, which extended along the postero-superior aspect of the petrous bone close to the internal auditory canal and the superior petrosal sinus. A culture from the pus showed staphylococci. Sixteen days after the third operation the patient was suddenly attacked by a severe headache, with fever and very rapid pulse. Vomiting occurred later. The following day the condition was worse: the headache continued, with frequent exacerbations; there was hyperæsthesia, and localized hypertonicity of the muscles, affecting chiefly the flexors of the leg and thigh, and in a less degree the extensors of the head.

Quincke's lumbar puncture was practised, and 4 or 5 c.c. of cerebrospinal fluid was drawn off. Microscopic examination of the fluid showed a great increase in the number of eosinophile polynuclear leucocytes, but comparatively few mononuclear leucocytes were found. Cultures from the liquid gave negative results. The puncture was followed immediately by remission of the painful symptoms; the pulse fell from 140 to 100. This improvement was maintained for six hours. The patient died in the evening of the following day.

At the autopsy pus was found at the base of the brain. In the depth of the posterior cavity of the operation-wound there was a very minute point of caries close to the internal auditory meatus and 4·5 millimetres from the upper edge of the petrous bone. Opposite

this, which appeared to be the starting-point of the meningeal infection, the dura was thickened and presented vascular striæ.

*Chichele Nourse.*

**Manasse, Paul** (Strasburg).—*A Study of the Pathology of the Internal Ear and the Auditory Nerve.* "Arch. of Otol.," vol. xxxii., No. 2.

Two cases are described. The first case was one of multiple disseminated gray degeneration of the auditory nerves, in which nerve deafness was present in a man who died, at the age of forty-three, of pulmonary tuberculosis, and who during his illness had suddenly lost his hearing. The middle ear was normal, as were apparently all the parts of the labyrinth, but the auditory nerves contained large numbers of pale-pink areas between the fibres of the nerve trunks; they consisted chiefly of fibrous structures and corpora amylacea. The second case was one of disease of the labyrinth and the auditory nerves in a syphilitic subject. The patient, a man aged thirty-five, with a history of specific infection, and who had been under treatment for nerve deafness for about a year, had died suddenly upon the street. Gummata were found in various parts of the body. Microscopical examination of the left petrous bone showed that the middle ear was normal, but in the internal ear were extensive pathological changes. Fine granular deposits, containing no cells, were noticed, covering the epithelium of the roof of the scala vestibuli, the under surface of the lamina spiralis ossea, and the basilar membrane in the scala tympani. The new formation was made up of fibres, arranged in a coarse network; the auditory nerve in the internal meatus was greatly distended, and contained a number of round cells and corpuscles between its fibres. In the right ear the same conditions were present, but more marked, one part of the scala tympani being completely filled with a fibrillar network of connective tissue. The conditions were such as result from chronic inflammatory changes.

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### THERAPEUTICS.

**Koerner, O.**—*The Usual Methods of Treatment and Operation in the Ear and Throat Clinic at Rostock.* "Arch. of Otol.," vol. xxxii., No. 2.

The clinical consulting-room has to be kept extremely clean, and for this purpose should have the brightest daylight in all corners. Care should be taken in the preparation of a patient for operation, cleansing and sterilizing not being limited to the mastoid process, in view of the possibility of it being necessary to follow a purulent process deep in the occipital bone or within the cranial cavity, etc. Changes of dressings are made in a special room, the parts round the wound being cleaned with benzine after the removal of the old dressing, and a sterile towel with a central opening, through which the ear and the wound appear, being placed over the head of the patient.

Small operations, like the removal of adenoid vegetations, should not be performed in the dispensary rooms, for fear of the infections which frequently follow. These come on usually forty-eight hours after the operation, rarely earlier, and Koerner considers them as either caused or favoured by removal of the pharyngeal tonsil. He holds that non-operative anginas also begin in the pharyngeal tonsil, as is shown