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DR. ALEXANDER *in the Chair.*

Abstract of Report.

Intact Fluid Portion of the Labyrinth with Disease of the Nerve-endings or of the Nerve itself.—H. Neumann.—A man, who was under treatment in 1903 for chronic adhesive processes associated with deafness in the left ear and almost normal hearing on the right side, had now gradually become completely deaf. Rotation also now produced no result, but a response was obtainable with the caloric test. This state of affairs was usually found in cases of hereditary syphilis before the labyrinth function was yet completely lost. (In this man, however, the Wassermann reaction was negative, and he had healthy children.) As an explanation, Neumann submitted that the caloric stimulus was stronger than the more physiological action of rotation, and that accordingly, in a certain stage of disease, the former test might evoke a reaction—although this might be only a weak one—where the latter would fail to do so.

BÁRÁNY considered the account most interesting, and stated that he had not yet met with a similar instance. In cases of fistula, as was known, the conditions were reversed—the caloric response disappearing first, and then the reaction to rotation. Of course the caloric test could be used to obtain a long-continued effect, whereas rotation was preferable when a sudden stimulus was required.

NEUMANN did not agree that the reaction to caloric test was weaker than that of rotation, as Bárány would seem to imply in his reference to cases of fistula, since the differences to which he alluded might well be due to the fact that, whereas the caloric test could be applied to one side alone, in the rotation test the sound side could never with certainty be excluded, and he reminded them in this connection that a spontaneous nystagmus would sometimes be influenced by the caloric test when rotation would have very little or no effect. He had attempted to investigate these points more definitely by applying the caloric test during rotation, but had found the results unreliable, since with the head in the erect position, rotation influenced the horizontal, and the caloric test the superior vertical, canal.

Slowly-growing Tumour of the (?) Cerebello-pontine Angle.—O. Beck.—A man, aged thirty-nine, under continuous observation for two and a half years. When first seen, right ear and labyrinth intact; left ear completely deaf, tympanum intact, tinnitus. Response to cold and hot caloric test very weak but present. Rotation normal; no spontaneous nystagmus. Condition in the left ear remained thus for a year. Ocular fundi normal, other nerve examination negative. Then without any other symptoms the caloric reaction was completely lost, and the duration of the after-rotation nystagmus gradually became less. Two months ago the patient complained that his gait had become uncertain,

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and that he had at times attacks of giddiness. Examination now showed: Right side normal as before, left side deafness. Marked spontaneous oscillatory nystagmus on looking to the left, otherwise none. Duration of after-rotation nystagmus—10 times to the right, 8–12 secs.; 10 times to the left, 12–15 secs. Ocular fundi normal. Spastic paresis of left leg. Babinski, left. Weakness of the left facial, especially the buccal branch. Hypæsthesia of right cornea, anæsthesia of the left.

An accurate diagnosis was certainly difficult, but although as yet no optic neuritis had appeared the exhibitor considered that the lesion was probably a slow-growing tumour in the cerebello-pontine angle.

Paradoxical Galvanic Reaction in a case of Left-sided Chronic Suppurative Otitis Media with Fistula.—Hofer.—The radical operation was performed on the left side in a woman, March 5, 1912; examination on the 14th of the following month gave the following result: Right ear, hearing almost normal; dry perforation. Left, wound convalescent. Hearing, $2\frac{1}{2}$ m. for cv., $\frac{3}{4}$ m. for Whp. (tested with noise apparatus). No spontaneous nystagmus. Fistular symptoms still present typically, *i. e.* quick component to the diseased side on compression. Rotation, 10 times to the left, nys. to the right lasting 32 seconds; 10 times to the right nys. to the left lasting 30 seconds, *i. e.* no appreciable difference. Reaction to the caloric test rather more brisk on the healthy side; duration about equal on each side. Cathode left: rot. nys., L. very marked. Cathode on both sides, rot. nys., L. very marked. Cathode on the right side, rot. nys. L. ! ! !. Anode on the left side, rot. nys. R. Anode on both sides, rot. nys. R. Anode on the right side, rot. nys. R. Breaking the current reversed the nys. in each case. These results were repeatedly tested and found constant. Pointing reaction of Bárány normal, *i. e.* deviation in the opposite direction to the nystagmus. The paradox lay in the fact that the nystagmus occurred in the opposite direction to that normally obtained. Four ma. were used, but the effect could be elicited easily with only 2 ma.

By April 23 the normal galvanic reaction replaced the usual response, and later the fistula symptoms disappeared.

Hofer suggested that the fistula allowed the current such easy exit and access that its major effect was concentrated on the diseased side.

Bárány had never seen an instance of this phenomenon nor knew of any description hitherto published. In this case, which he had examined with Hofer, if the cathode were placed on the healthy side and the anode on the forehead, nystagmus occurred towards the diseased side. It was interesting that the disappearance of the paradoxical condition synchronised with the closure of the fistula. Babinski had repeatedly pointed out that in cases of unilateral ear disease, the passage of an electrical current, irrespective of the relative position of the electrodes on the head, produced a leaning of the head towards the diseased side.

Ruttin stated that he had described some cases of paradoxical galvanic reaction in which nystagmus occurred towards the healthy side some years ago at the Basle Congress.

Post-Traumatic Deafness Left with Destruction of the Vestibule Right.—F. Hofer.—A man, aged twenty-five, sustained severe concussion six years ago in a tramcar accident, and lay for twenty-one days unconscious. For the next two years he suffered with headache and giddiness but now for the last four years had felt quite well. As a boy

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he had had a box on the left ear, and always heard worse on that side since.

Examination.—Right, Læsio auris internæ, hearing reduced to Cv. $1\frac{1}{2}$ m., and Whp. ad conch. (tested with noise apparatus). No spontaneous nystagmus, prolonged cold caloric test unresponsive right, but after forty seconds irrigation of the left ear marked rotatory nystagmus to the right was induced lasting four minutes with giddiness. Galvanism evoked neither nystagmus nor giddiness in any way. Rotation to the right and left produced nystagmus to the opposite side of about equal duration, but weaker than normal.

Thus the vestibular nerve was destroyed on the right, whilst on the left side the cochlea nerve remained functional, but the reaction of the vestibular nerve was depreciated; this was the result presumably of labyrinthine concussion. Although there was no evidence of syphilis this could not be absolutely excluded as the patient declined the Wassermann test.

The Diagnosis of Tumours in the Posterior Fossa.—Ruttin.—A man, aged thirty-four. History: Said to have been deaf on right side since childhood. Giddy for two years, tinnitus for one year, headache for seven months, blind for three months. Married, four children, one alive and healthy, three died of "water on the brain." His wife has had no miscarriages: 1894, pneumonia: 1901, joint rheumatism: 1903, gonorrhœa.

Examination.—Eyes, secondary atrophy, both sides following optic neuritis. Blindness. Wassermann negative.

Nervous system: Alteration of pulse with alteration of position. Left side trigeminal hypalgesia, ataxia, Babinski. No facial paresis. Ears: Mem. tym. normal. Hearing: Right normal; left absolute deafness to speech and forks.

Spontaneous nystagmus, horizontal—to the right on looking to the right, to the left on looking to the left—fairly marked—otherwise directed to the left in coarse movements. No nystagmus appeared behind opaque glasses.

Spontaneous deviation slightly perhaps towards the left with the right hand. No spontaneous deviation in the wrist joints.

Equilibration: Slight tendency to fall towards the left unaffected by turning the head to the right or left, but much accentuated if the head were bent backwards.

Caloric reaction: Left negative, right very active. Typical deviation of both arms to the right and tendency to fall to the right. Head rotated to the right, falling more backwards. Head to the left, falling more forwards. Head bent forwards, falling more backwards. Head bent back, falling more forwards. The test produced no giddiness, vomiting, or even nausea.

Rotation: To the R. nys. → L. 20 seconds, no giddiness, vomiting or nausea. Typical deviation. To the L. nys. R. ← 20 seconds, slight giddiness, no vomiting or nausea. Typical deviation. Rotation to the right with the head bent to the right, nys. ↓ 10 seconds, no giddiness. Rotation to the left with the head bent to the left,[1] nys. ↑ 11 seconds, no giddiness. Rotation to the right with the head bent forwards, nys. rot. L. 14 seconds. Rotation to the left with the head bent forwards, nys. R. rot. 14 seconds.

Galvanic tests.—Anodes separated, cathode on forehead, nys. rot. L. Cathodes separated, anode on forehead, nys. R. rot. Cathode left, anode

[1] ? Misprint for "right."—A. R. T.

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on forehead, no nys. Cathode right, anode on forehead, nys. R. rot. Anode left, cathode on forehead, nys. rot. L. Anode right, cathode on forehead, no nys.

The result of the various examinations therefore pointed to the presence of a tumour at the cerebello-pontine angle. The cochlear, vestibular, trigeminal and vagus were affected; the facial was intact. How much was due to the tumour and how much to its remote effect could not with certainty be determined. It was especially interesting that in spite of the complete destruction of the posterior vestibule (negative reaction to the caloric and galvanic tests) the rotation response appeared the same on each side. A compensatory condition would naturally be suggested to explain this, against which hypothesis, however, the following observations stood in opposition. As he (Ruttin) had pointed out, no compensation occurred in respect of vertical nystagmus, a fact which confirmed what they had first supposed on theoretical grounds. This compensation they had regarded as due to the establishment of an equalisation in the effect of the movements of the labyrinthine fluid past the ampullæ, a condition which could not take place in the posterior vertical canals, as the fluid in these during rotation was influenced in the same direction simultaneously on both sides.

As the result of a large number of examinations he had ascertained the following data: Normal rotation with the head erect—to the right, nys. → L. 15–30 seconds; to the left, nys. R. ← 15–30 seconds. Rotation with head erect and, *e. g.* the right labyrinth destroyed and uncompensated, to the right, nys. → L. 15–30 seconds: to the left, nys. → L. 3–8 seconds; or, with the right labyrinth, *e. g.* destroyed but compensated, to the right, nys. → L. 10–15 seconds; to the left, nys. R. ← 10–15 seconds. The same result, in a lesser degree, would hold good for the caloric test.

On the other hand, the mean of the results he had obtained as regards vertical nystagmus were: Normally, right rotation with head bent to the right, ↓ 10–16 seconds; with head bent to the left, ↑ 5–8 seconds.

Thus, *normally*, there is a constant and appreciable difference in the duration of the nystagmus produced in this latter method, the upward directed movement being always shorter than the downward nystagmus. Cases, however, did occur in which the labyrinth on one side had been destroyed giving results equal to those obtained in normal people, both where compensation had and had not taken place, but that as regards vertical nystagmus no establishment of the compensation phenomenon would appear.

In the case at present under consideration the vertical nystagmus, both upwards and downwards, was of equal duration, a condition of affairs which could not be viewed as being related to that compensation phenomenon which occurred in connection with a peripheral destruction of the vestibular apparatus. Nor could it be looked on as due to a partial loss of function as was sometimes found, *e.g.* in cases of congenital syphilis where the rotation reaction was lost, whilst a response to the caloric test could still be obtained, since here not only the effect of the caloric but also of the galvanic stimulus was lacking. One could therefore diagnose the presence of some central lesion which resulted in the elimination of that subtle difference between the effect of the currents to and from the ampullæ in the posterior vertical canals.

The appearance of the compensation of the vertical nystagmus should be of importance in similar cases as regards determining the presence of tumour.

[A further account of this will be most interesting and important.]

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Extraction of the Stapes.—Leidler.—During the removal of a polypus from the attic in a case of chronic suppurative otitis media the entire stapes (head, crura and footplate) was inadvertently extracted. Previous to the operation examination had revealed an advanced degree of deafness on the same side. Immediately after the extraction no alteration in the hearing and no evidence of labyrinth involvement could be detected, nor had any symptoms since (about two weeks) appeared. It would seem that it must have been merely the removal of an already exfoliated stapes.

Bárány had removed a polyp attached to the stapes intentionally during a radical operation. Hearing had been tested, fistular symptom and spontaneous nystagmus had been excluded beforehand. Afterwards a very lively fistular symptom could be elicited which lasted some six weeks, but there had been no spontaneous nystagmus or giddiness. Hearing was 6 m. for Cv. In this case the stapes can only have been slightly moved.

Bondy quite agreed that the stapes in Leidler's case was already exfoliated, as otherwise much trouble would probably have followed. He had once performed the radical operation in a case with the fistular symptom in which the canal was found intact, but pressure with a swab of wool over the region of the oval window produced the symptom. This was done several times in order to demonstrate to a large number of onlookers. Suddenly the symptom could be no longer evoked. This he thought was due to a luxation of the stapes and an escape of fluid. After the operation the patient showed the usual symptoms of destruction of the labyrinth, *i.e.* giddiness, vomiting, and nystagmus towards the sound side. Hearing was preserved till the third day, when it disappeared. In spite of the then immediately performed labyrinth operation, the patient died of meningitis.

Bárány remarked that it was important to be sure that the tube was closed before concluding that no fistular symptom was present, and quoted clinical evidence in this respect.

Alexander considered that the important point in the case was the negative result to the fistular symptom, which he regarded as due to the presence of fibrous tissue shutting off both the vestibule and cochlea.

Alex. R. Tweedie.

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Report by Dr. L. M. Inghram.

May 13.

(*Continued from p.* 512.)

Mastoid Sequestra containing all Three Semicircular Canals, with a Report of the Subsequent Labyrinthine Reaction.—Dr. J. M. Ingersoll (Cleveland).—The author presented the case of a girl, aged six, with evident mastoid infection on the right side. She had had scarlet fever two months before, followed by suppurative otitis media

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