ANATOMICAL FINDINGS IN A CASE OF FACIAL PARALYSIS OF TEN DAYS' DURATION IN A GENERAL PARALYTIC, WITH REMARKS ON THE TERMINATION OF THE 'AUDITORY' NERVES.

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In the Neurologisches Centralblatt of August, 1896, Dr. E. Flatau described a case of facial paralysis of several months' duration. He found marked alterations in the cells of the nucleus of the same side and plain degeneration of the fibres. Further, with the Marchi stain he observed a decussating part of the root, such as Obersteiner pictures. The earlier descriptions of peripheral facial paralysis include no data on the condition of the medulla.

The following case, of much shorter duration, has been examined with the Nissl method only, but offered several points worth reporting.

The patient, C. C., 42 years old, was admitted November, 1894, with general paralysis, which took the course of the demented form. The patient died in a convulsion on March 26, 1896. Ten days before death a paralysis of the muscles of the left side of the face was noticed. Nothing was found to indicate middle ear disease, and to all appearance the paralysis was like the so-called rheumatic facial palsy. It was impossible on account of the patient's dementia to
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examine the hearing or taste. Paralysis was complete. An autopsy was made nineteen hours after death and part of the region of the facial nucleus was fixed with alcohol, 94 per cent. The rest, together with the middle ear, was preserved in 10 per cent formalin.

The examination of the medulla oblongata gave the following results: On the right side nothing abnormal was noticed; on the left side the Nissl specimens showed to the naked eye a blue streak along the distribution of the auditory nerve in its ventral and dorsal roots (Plate XLIV, Fig. 1). Microscopically, the termination of these roots proved to be infiltrated with a great number of neuroglia cells. In explanation of Fig. 2 (Plate XLIV) it is worth stating that the neuroglia accumulation is not so marked close to the cell bodies of the so-called auditory nuclei, where we would find it in infiltration due to typhoid fever, and even more in typhus, but rather in the areas of end-arborizations, where we find neuroglia cells in all stages up to the form called "spider cells." The dorsal nucleus of the eighth nerve and the ventral nucleus were both infiltrated, and between them there was a relatively free place with the large cells of the nucleus of Deiters. The cells of the infiltrated portion showed a marked decay of the large granules, and in the most of them the cell body was a little shrunken, and the nucleus was small, showing a tendency to be dislocated towards the surface. The cells of the free Deiters' nucleus were perfectly normal, resembling on the whole Nissl's "motor type." The facial nucleus showed the characteristic changes described in the experiments of Nissl on the rabbit: swelling of most of the cells, dust-like decay of the granules, in many cells an almost homogeneous swelling of part of the cell body, dislocation of the nucleus to the surface in many of the cells and somewhat irregular contour of the nuclear membrane. In many places the homogeneous swelling seems, however, to go over into the formation of a fine yellowish pigment-like substance (Plate XLV, Fig. 3). The nuclei in most of the cells showed a diffusely bluish color. The nucleoli of many of the cells show little vacuoles and notches (sometimes two) along the margin; occasionally two nucleoli are seen, and quite frequently one, two or even three accessory nucleoli. All the cells in the nucleus are more or less affected; there is only little neuroglia infiltration.
It is worth mentioning that along the course of both the seventh and eighth nerves no infiltration is noticed. It is limited altogether to the region of the end-arborizations of the 'auditory' nerve. Marchi and Weigert stains were not used.

The examination of the contents of the internal auditory canal brought out the cause of the condition found. The periosteum of the canal showed a number of hemorrhages and round cell infiltration, by which both the nerves and the ganglion had been compressed, the ganglion too being strongly invaded by leucocytes. The nerve cells in the haematoxylin sections appear granulated, brownish, as if transformed into pigment bags. The nucleus is oval or round, rather small, diffusely and poorly stained, often eccentric (Plate XLV, Fig. 4). In a few of the cells a nucleolus is still visible. The infiltration does not extend along the nerves towards the medulla. It is largely of mononuclear cells in the periosteal tissue; in the ganglion, however, there are many polynuclear cells.

The findings can be summed up as follows: In a case of general paralysis a hemorrhagic infiltration of the periosteum of the internal auditory canal has led to an invasion and compression of the auditory cells and the nerve, and perhaps later the facial nerve. Ten days after onset of the facial paralysis the nucleus of the facial nerve, of the same side only, showed the typical changes of reaction to a peripheral lesion as described by Nissl and others in experiments on animals. There was no evidence of decussation of elements of the seventh nerve, the cells of the right nucleus being all intact in the numerous sections examined. The terminal nuclei of the eighth, both the dorsal and the ventral, showed well circumscribed neuroglial-cell infiltration, whereas the nucleus of Deiters is almost completely free. The central auditory cells are also slightly affected within the region of infiltration.

The case is of some interest, as it shows plainly two forms of reaction to injury of peripheral nerves, the reaction in the sensory elements being first described here, and found owing to the lesion of the cells of the sensory nerve.

The case speaks against a decussation of the roots of the facial
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nerve and for a relative independence of the nucleus of Deiters from the auditory nerve endings (against the views of Bechterew), and gives an illustration of how an affection of one fibre system may involve the cells of another system with which it comes in contact. In many respects the case is as clear as an experiment.

DESCRIPTION OF PLATES XLIV AND XLV.

Plate XLIV.

Fig. 1.—Facial cochlear and vestibular nuclei and Deiters' nucleus. Drawn with Reichert's lens 20 from a specimen stained with Nissl's method. Infiltration of cochlear and vestibular nuclei.

Fig. 2.—A small field from a thin section of the cochlear nucleus; central auditory cells and neuroglia infiltration. The largest spider cells at a distance from the auditory cells. Nissl's stain. Leitz oil-immersion 1/2, Ocular 2.

Plate XLV.

Fig. 3.—Cells from facial nucleus. Normal side (ganglion cell at left hand of figure) and paralyzed side. Leitz oil-immersion 1/2.

Fig. 4.—Cell from the infiltrated ganglion in the internal auditory canal and several polymuclear leucocytes. Haematoxylin-fuchsin. Leitz oil-immersion 1/2.