EXAMINATION
OF THE
ORGANS OF HEARING,
FROM THE BODY OF A BOY, AGED 13 YEARS,
WHO HAD BEEN THE SUBJECT OF
CONGENITAL DEAFNESS.

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WITH the exception of traces of a rather turgid condition of the vessels ramifying on the promontory, more particularly of the right tympanum, the appearance of both these cavities, with that of their complicated apparatus of bones, muscles, nerves, and lining membranes, was perfectly natural. The openings into the mastoid cells, on the one hand, and into the Eustachian tubes on the other, were also as in the healthy subject.

The labyrinth of the right side was examined, by making a section of the petrous bone with the saw. The cochlea, thus divided, was seen to be filled with a matter, which, from its appearance, might have

been denominated "caseous." This, however, I am convinced, merely arose from the minute saw-dust of the hard bone, having formed a kind of paste by admixture with the aqua labyrinthi. The free edge of the lamina spiralis possessed a highly vascular appearance. The periosteum lining the vestibule and semicircular canals, had evident traces of vascularity, though perhaps scarcely more than may be esteemed as normal; it was lubricated by its proper aqua labyrinthi. The horizontal semicircular canal was imperfect on this side, in about the outer third of its extent; but what, perhaps, might be regarded as an abortive attempt at its formation, existed, as is attempted to be shewn. I did not discover any trace of sacculus or utriculus vestibuli, or of membranous semicircular canals. From the soft state of the acoustic nerve, it was impossible to make out the points of its distribution.

In order to avoid the probable source of fallacy alluded to, I did not employ the saw in the examination of the labyrinth of the left side, but, by means of a strong knife, divided the petrous portion of the bone with a single stroke of the hammer. I thus obtained a view of the vestibule, in which, near the opening of the scala vestibuli, and extending into that canal, there was a minute quantity of a calcareous-like incrustation, closely adhering to the periosteum, and which probably was the remains or rudiment of the "otolith" of Breschet. Here,

likewise, no utricle or sacculus was met with ; there however were very minute, gelatiniform, membranous, semicircular canals. In the cochlea of this side, there was no appearance of anything like a caseous deposit. The osseous semicircular canals were complete on this side.

With respect to the apparent absence of the greater portion of the membranous labyrinths, I must confess that I am not prepared to insist much upon the circumstance ; as, from the highly delicate structure of the part, coupled with the length of time which had elapsed since death, it is more than possible, that, notwithstanding every care, they may have been accidentally removed during the process of cutting the bone in the one instance, and sawing it in the other.

Although records of dissections of the ear, in cases where congenital deafness had existed, are far from numerous, yet a few are to be met with, scattered through the pages of our medical literature. From our ignorance, however, of many points connected with the physiology of the organ, it is in many cases impossible to say, what share the alleged deviations of structure have had in the production of the deafness. There can, however, be little doubt, that those affecting the labyrinth are of primary importance.

The present case is interesting, from presenting

us with the imperfect development of one of the semi-circular canals, as the only cause, to which the deafness can, with any probability, be ascribed. As these canals were perfect on the other side of the body, this case would appear to indicate, that the presence of this mal-formation in one of the organs, is sufficient to prevent the exercise of the function of hearing; but before this can be safely assumed as certain, it will of course be necessary, to have the view established by the result of an extended series of observations, directed to this especial point. It at least shews the necessity of future enquirers into this subject, invariably dissecting both the organs.

From the observations of Dr. Haighton* and Mr. Cline†, it results, that the only appearance sometimes met with in these cases, is that of a caseous substance in one or more of the cavities of the labyrinth. I allude to this, in order to take the opportunity of pointing out a source of fallacy arising out of the mode of conducting the examination, and to which, as I have related, I was myself exposed.

The existence of calcareous bodies in the vestibular cavity of fishes has been long known to comparative anatomists; but it is only of late, that it has been shewn by Breschet, that these have their analogue in the human species and in all the mammalia, in the form of two minute calcareous bodies, which, accord-

* Mem. of the Medical Society, Vol. III. pp. 1—15.

† Sir A. Cooper, in the Phil. Trans. for 1801, p. 447.

ingly as they are of a hard or soft consistence, he denominates otolithes and otoconies *. These bodies, which are situated in the centre of the sacculus and utriculus vestibuli, and appear to be suspended in the aqua labyrinthi, through the medium of minute nervous fibrillæ, have not attracted that attention from British anatomists and physiologists, which, from the interesting nature of the question, might reasonably have been expected; but they deserve to be pointed out here, as liable to mislead the morbid anatomist who is unacquainted with their existence. Itard gives a case of congenital defect of hearing, in which, the presence of small portions of calcareous matter in the vestibule and tympanum, is alleged as the cause of deafness. Whether or not the semi-circular canals were examined does not appear †.

* Annales des Sciences Naturelles, xxix. 99.

† Traité des Maladies de l'Oreille, &c. Cooper's Surgical Dictionary, 1830, p. 432.