

after the operation, and this condition remained practically unchanged until the death of the animal.

Ferrier states that he has not yet been able successfully to carry out observations on animals in which the temporal lobes have been destroyed on both sides; but if, as Schafer's experiments seem to indicate, the whole of the temporal lobes, like the other cerebral lobes, may be removed without entirely abolishing reaction to sounds, we should have reason for believing, with Louget, Goltz, etc., that in monkeys, as well as lower animals, a crude and simple form of auditory sensation is still possible through the agency of the lower centres.

Luciani and Tamburini found that unilateral destruction of the upper and posterior part of the third external convolution in dogs caused deafness in both ears, but to a greater extent in the ear of the opposite side. These authors believe that semi-decussation of the auditory nerves exists, similar to that of the optic nerves, and that both ears are represented in each cerebral hemisphere.

The occurrence of deafness from cerebral disease in man is unusual, owing to the extreme rarity of bilateral lesions affecting simultaneously both superior temporal gyri. There are, however, on record two important cases in which this double lesion occurred.

Shaw has recorded the case of a woman, aged 34, who, two months before her admission into his asylum, lost power in the right arm, and soon after had a sudden apoplectic seizure, resulting in loss of speech and deafness. The loss of power in the right hand speedily passed off. She became excited, incoherent, and subject to delusions. On admission she was found to be totally deaf and blind. Tactile sensibility and smell were unimpaired. She had occasional fits and ultimately died of pneumonia a year after her admission. Post mortem examination showed complete atrophy of the angular gyri and superior temporo-sphenoidal convolutions of both hemispheres. The other cranial nerves were normal in appearance, but the optic nerves showed increase of the connective tissue septa, atrophy of the nerve fibres, and spaces filled with a colloid material. Whether the blindness was due to the lesion of the angular gyri alone, or to the degenerative

changes in the optic nerves, is a question; but the sudden onset of deafness in this case, coincidently with symptoms of cerebral lesion and the condition of the brain post mortem, point to the destruction of the superior temporo-sphenoidal convolutions as its cause.

A similar case has been reported by Wernicke and Friedlander.

The affections of hearing with which we are most familiar in connection with cerebral disease are the various forms of what is called "word-deafness"—a condition in which auditory ideation is impaired more particularly as regards the association of articulate sounds with acts of articulation and things signified. The word-deaf is not devoid of auditory sensation, for he can hear the ticking of a watch, and can recognize and hum an air, but articulate sounds, except perhaps his own name or some simple combination of words, have no meaning, and cannot be repeated. Word-deafness has been found associated with affection of the superior temporal gyrus in the left hemisphere. Seppili finds that in seventeen cases in which a post mortem examination was made, in every one there was lesion of the superior temporo-sphenoidal convolution, and twelve in which also the second or middle convolution was involved.

Of twenty-five cases of word-deafness, in all, except one, there was obvious lesion of the superior temporal convolution.

Further confirmation of the localization of the auditory centre in this convolution is afforded by cases of auditory discharges or subjective auditory sensations in connection with irritative lesions implicating the gyrus. Gowers has reported two cases of this nature. In one a tumor affecting the superior temporal convolution caused convulsions commencing with an auditory aura referred to the opposite ear. In the other a tumor affecting the superior temporal gyrus caused unilateral convulsions, preceded by a loud noise, as of machinery; and Hughes Bennett has reported several cases of auditory sensory discharges, followed by temporary loss of hearing in the opposite ear, or in both.

The facts of human pathology, therefore, undoubtedly support the view that the sense of hearing is localized in the temporal lobe, and