

epithelium was diminished or wanting; in consequence, small superficial ulcers were formed.

The third case showed a pale, thickened, granular mucous membrane in the larynx, and about the middle of the right vocal cord a two to three millimetre large hæmorrhagic ulcer. The mucous membrane of the trachea exhibited nodes in some parts arranged in rows, in others single, the larger of which showed small openings on their summits. They were soft, white, and showed here and there in the recent state a dark areola. Of special interest were the pathological changes on the edge of the vocal cord. About the middle of the right vocal cord the proper pavement epithelium was wanting to the extent of two millimètres. The covering layer was sharply defined with incurved edges. This defect was situated on the top of a round node, which consisted of well-preserved—only in part in the superficial layer—degenerated leucocytes. This small lymphoid tubercle was surrounded on all sides by hæmorrhagic tissue, which perpendicularly reached to the muscle layer. The lengthy duration of this hæmorrhagic infiltration is shown by the state of the fibrinous part of the extravasation, which is in the form of a regular network of hyaline-looking trabeculæ. In the meshes lie red blood corpuscles, mostly degenerated, some remains of leucocytes, and, in addition, cut vessels filled with freshly coagulated fibrin. This hæmorrhagic areola extends to a considerable distance between the subepithelial and elastic tissue layer. The tracheal ciliated epithelium is mostly exfoliated, the basal membrane preserved. The nodules extend on one side to the free surface, bulging the basal membrane convexly and thinning it externally; on the other side they extend to the intertracheal tissue.

With regard to these changes, the most interesting is the leucocythæmic infiltration of the laryngeal mucous membrane. The formation of nodules is important clinically, either from their size or from ulceration with formation of pus. Extensive inflammation in the soft parts or cartilaginous framework may be a source of danger. If the nodules are on exposed parts they readily break down and form ulcers. Hæmorrhages are to be frequently expected from the ulcers. More important clinically is the diffuse infiltration of the larynx and subcordial space. The more developed laryngeal changes seem usually to develop a few weeks before death; infiltration of the larynx may be very rapid. Under what conditions there is more tendency to formation of nodes or infiltration, and in what percentage of cases laryngeal changes occur, has not been settled. *Guild.*

E A R.

Alt, F. (Vienna).—*A Contribution to the Pathology of the Auditory Cortical Centre.* "Monats. für Ohrenheilk.," Jan., 1898.

ALT describes an interesting case of crossed cortical deafness. Few cases have been observed. In the majority of recorded cases no exact examination of the ear was undertaken; the methods were inefficient, and conditions really physiological attributed to anatomical lesion in the cortex. Thus Wernicke quotes a case of Hutin's of supposed cross deafness in a man of seventy-six, who heard the watch on the right side at twenty-five centimètres, and on the left side only close to the ear. *Post mortem* a patch of red softening was found in the cortex, involving the lower parietal lobule, and the adjoining parts of the occipital and temporal lobes, and to these lesions the deafness was ascribed. Further, in

cases in which the hearing functions were examined, the examination was very incomplete.

In some instances the auditory centre has been referred to other regions of the cortex than the temporal lobe, on the strength of *post-mortem* examinations. Thus, Luys reports a case of deafness following bilateral suppurative otitis media in which the auditory nerves were greatly atrophied, and also the cuneus, the adjoining occipital convolutions on both sides, and the precuneus on the right side; and he locates the auditory centre accordingly in conformity with this result.

In the same way Strimpel, on the strength of a *post-mortem* examination, ascribes permanent unilateral deafness, with inability to localize sounds, to a lesion of the parietal lobe.

The majority of authors place the auditory centre in the posterior part of the superior temporo-sphenoidal convolution, relying upon the following facts:—

In Gowers's case of extensive tumour of the temporal lobe, the oldest part of the growth lay immediately under this convolution. Convulsions were present as an early symptom, with an auditory aura on the opposite side.

Gowers's second case was similar, but there were no convulsions.

Wilson's case. A patient, four months before death, heard a loud noise in his ear, followed by unconsciousness and convulsions. The attacks were repeated, and, *post mortem*, a tumour was found in the first right temporal convolution.

Thus, observations combine to show that the final distribution of the auditory fibres is in the cortex of the temporal lobe, either in the posterior part of the first convolution, or in the posterior two-thirds of the first and second convolutions.

The assumption is that the first temporal convolution on each side is in relation to the organ of hearing of the opposite side. On the other hand, it may be taken as proved that each auditory nerve is in connection with both temporal lobes. This is indicated by the fact, now repeatedly observed, that in unilateral disease the crossed deafness is of temporary duration, the hearing power being restored after a variable time. This explains the fact that in many recorded cases there was no deafness at the time of examination, although, *post mortem*, the auditory cortical centre on one side was found to be destroyed.

With unilateral disease one would naturally expect some loss of hearing power in both ears. Gowers assumes that only the connection with the opposite cerebral hemisphere is ordinarily functionally active.

There are a number of diagnostic points to help us in localizing lesions of the *left* temporal lobe, but in dealing with the *right* the difficulties are so great that Oppenheim thinks such a diagnosis (of tumour, for instance) is never justified.

For the diagnosis of tumour of the left temporal lobe, sensory aphasia—the expression of a lesion of the sensory speech centre—is the most important localizing symptom. This centre occupies the posterior part of the first, and perhaps also of the second, temporal convolution on the left side. The symptoms of such a lesion are word deafness, and the consequent paraphasia, agraphia, alexia (reading, writing from dictation, copying, and the reading of written matter interfered with). This clinical picture may be very considerably complicated by co-existent central deafness, which makes impossible the comprehension of spoken speech. For the localization of tumours in the temporal lobe the relation of the tumour to the motor and sensory centres and tracts, and also to the optic fibres, is important.

As regards deafness to musical sounds. According to Monakow, in lesions of the left temporal lobe this kind of deafness often accompanies word-deafness. But deafness to musical sounds may exist without word deafness, or it may be slight in comparison with the latter.

With reference to Edgreen's case, Monakow thinks that for the production of deafness to musical sounds a bilateral lesion of the first temporal convolution is of the greatest importance.

He believes, further, that the right auditory centre has to do chiefly with the perception of tones ("klänge"), while the left has more to do with the analysis of word sounds ("wortklänge"). As analogous he cites the case of lesions of the third left frontal convolution causing motor aphasia, while lesions of the same convolution on the right side cause dysarthria.

From experiments upon animals Münk concludes that the anterior part of the auditory centre has to do with the perception of the higher tones, and the posterior part with the lower tones.

Before concluding that bilateral deafness is due to lesions in both temporal lobes we must see—

- (1) That the symptoms proper to such a lesion are present (*see above*).
- (2) That other possible causes of the deafness are excluded.

The following are the notes of a case observed by the writer in Prof. Schrötter's wards :—

P. C., aged thirty-three, cook. Has been ill three years. He went to bed quite well one evening, and awoke next morning to find himself paralyzed on the right side. He could not speak, was deaf on the right side, had vertigo and a rushing noise in the right ear. His memory of all his former life, alike of his childhood and his most recent past, was completely gone. He gradually recovered some power, first in the right leg and then in the right arm, and in the same way his speech also returned after he had *lalled* like a baby for a considerable time. Six years before the attack the patient had a hard chancre, for which he had no antisyphilitic treatment. He was a heavy drinker.

On examination : a medium-sized, strongly built man. Internal organs normal.

His intellectual condition is curiously altered. As soon as one begins to busy oneself with him it seems to put him in great spirits, and he answers all questions laughing hilariously, as if it were a great joke. (With reference to his speech it must be remarked that the patient used to express himself well in his dialect, both German and Bohemian).

He can repeat readily after one words and sentences. Shown a familiar object he recognizes it at once and uses it correctly, although he cannot name it. This excites him much ; he scratches his head, strikes his chest, and, in a few instances, suddenly bursts out with the name of the object, with a loud laugh. Generally he fails to recollect the name, but he recognizes the correct name at once when it is mentioned to him.

Shown a spoon he says, "Jesus Maria ! Jesus Maria ! I know it, but I cannot say it." Shown a silver florin, and asked what it is, he replies, "Ten, 20, 30, 40, 50, 60, 70, 80, 90, 100 kreuzer." When asked his name-day (19th March), he first counts the months and stops at March, and he then counts the days and stops at the 19th, laughing merrily as he does so. He can say the Lord's Prayer and the alphabet, also the days of the week and the months of the year.

On trying to read he recognizes a few letters at once ; with others he is obliged to repeat the alphabet from the beginning, and stops at the particular letter. Connected words he cannot read, because he has forgotten the first letters of the word before he has pronounced the last. His writing cannot be tested.

Cranial nerves.—I. to VI. are normal.

VII. Lower branch of right facial partly paralyzed.

VIII. Left ear : watch heard at three mètres (normal). Right ear : inaudible on mastoid and in front of auricle. Whispered and loud speech gave the same

result; vibrating tuning fork C_2 on the vertex is perceived at the point of contact, and in the whole head. Rinne left +, bone conduction normal.

The large tuning fork C_2 is not heard in front of the right ear; bone conduction on the right side is said ("angeblich") to be shorter by nine seconds than on the left side. High and deep tones are equally well heard on the left side; on the right side nothing is heard; C , C_1 , C_2 , C_3 , and C_4 are tried.

The remaining cranial nerves are intact, and the other symptoms are those usual in hemiplegia from cerebral lesion. Sensibility to touch on right side of body somewhat reduced; to pain and temperature normal.

A lesion of the left temporal lobe spreading towards the cortex, and also towards the deeper parts, explains the combination of amnesic aphasia, right hemiplegia, and crossed deafness. It is probably a syphilitic endarteritis leading to thrombosis and softening.
William Lamb.

Marage.—*A Study of Ear Trumpets.* "Rev. Inter. de Lar., Otol., Rhin.," Mar., April, 1898.

THIS is part of the author's work on the study of the vowels. A variety of trumpets have been tested by photography of König's flames with a view to determine the purity of the sounds conveyed by them. In this paper is to be found the full description of the masseur-cornet (*vide* JOURNAL OF LARYNG., May, 1898), and also the details of the improved form of manometric and recording apparatus used by the author.
Waggett.

REVIEWS.

Spiess.—*Separatabdruck der Fortschritte auf dem Gebiete der Röntgenstrahlen.* Band I. The Use of Roentgen Rays in Rhinology. By Dr. GUSTAV SPIESS, Frankfurt.

THIS is a short paper illustrated with three photographs, in which the author shows how it is possible with the help of a fluorescent screen to open into the frontal sinus. He uses a drill driven by an electro-motor; each movement of the instrument and its distance from the frontal sinus can be seen on the screen, also whether it is too far back or too far forward. The drill has the advantage that the opening can be made more anteriorly than in Schäffer's method, as the thickness of bone is of less account. Such an opening is of use in diagnosis for syringing and removing pressure symptoms; it may be enlarged, and is in a suitable position for the patient carrying on treatment. He thinks that by opening in this way, allowing the secretion to escape, and cleansing, many acute cases will be prevented from becoming chronic. As the results of external opening are not always satisfactory, he expects that with improved instruments it will be possible through a nasal opening to curette all the recesses of the frontal sinus, and that even severe forms of empyema will be treated by rhinological rather than surgical methods. The first photograph shows a small tube passed into the opening made by the trephine.

Several points must be noted in this method. Lateral divergence of