until we know whether a radical excision of the growth is possible. With regard to rotating the larynx, I have done that several times in exploratory operations on the epilaryngeal region, but it gives a less satisfactory access to the region in question, and I see no objection to removing the ala of the thyroid; it does not cause subsequent stenosis, and it gives admirable access to the upper larynx. With reference to the dangers of the operation in comparison with those of laryngofissure, the difference is a very obvious fact of experience, and it is due to the fact that these epilaryngeal tumours are, technically, growths of the pharynx, not of the larynx. As long as we keep inside the larynx, we have nothing to do with such organisms as we heard of earlier in the meeting, the fusiform bacillus and the spirochætes of the mouth; but when the pharynx is encroached upon by the operation, they have always to be reckoned with and to be dreaded. Any wound involving the pharynx or œsophagus is liable to a sloughing infection which very small defects of technique may render extremely dangerous or wholly uncontrollable. The merest scratch of the epithelium of the pharynx leads, as is well known, to the formation of a slough. In laryngofissure, there being no implication of the pharynx, it is not necessary to take any *special* precautions against sepsis, whereas in operations done on the pharynx almost the whole procedure is concerned with protection against the effects of the peculiarly virulent local types of infection. The special dangers of the pharyngeal infections are well seen in an operation apparently so simple as the removal of a pharyngeal pouch. If the closure of the gap left by the excision of the sac is not such as to render leakage impossible, there is the gravest risk of very serious and even fatal sloughing cellulitis and mediastinitis. Such forms of cellulitis spread rapidly, and often without much external evidence, and even if the patient survive the immediate danger, are particularly apt to cause secondary hæmorrhage.

(*To be continued.*)

THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Meeting at Chicago, June 15 and 16, 1915.

(*Continued from p.* 233.)

Report of an Unsuccessful Labyrinthectomy for Relief of Distressing Tinnitus Aurium.—Arthur B. Duel.—Tinnitus aurium of such distressing character as to produce insanity, or to drive the sufferer to suicide, is, fortunately, a rare occurrence. The occasional case, in which every effort has failed, and where sedatives have become useless, except for the immediate time being, present as sad a spectacle as the most hopeless alien. The few cases that have been reported in which major operations, like division of the auditory nerve or destruction of the labyrinth, have been tried for their relief, have met with so little success that no one would be tempted to undertake another, except under great stress of circumstance, or some peculiar hopeful prospect, as in the case recorded.

The patient, a woman, aged sixty, married, had slight deafness

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following typhoid fever at the age of eighteen. At the age of thirty-five she first noticed noises in the head, described as escaping steam. Hearing became gradually impaired, and the noises persisted. She was variously treated by different specialists, without relief. She finally came under the observation of Dr. Fielding O. Lewis, of Philadelphia, in 1912. At that time she could hear slightly a watch in close contact with the left ear, and a whisper at about six inches. Local measures failed to improve the condition. She now complained of a monotonous humming around the outside of her head, with intervals of a thumping sensation on the right side of the head. The division of adhesions about the ossicles of the right ear, lumbar puncture, ossiculectomy of right ear, all gave but temporary relief, the tinnitus becoming more and more distressing, necessitating the administration of small doses of morphine. Destruction of hearing on the right side was suggested, but consultants advised against this procedure. Dr. Duel was then called in consultation. After noting all the necessary tests, and after discussing the problem of the possible outcome, it was decided to ablate the right labyrinth. A complete labyrinthectomy utterly failed to influence the tinnitus. The special feature of the case which caused its being placed on record, was the fact that three months after the labyrinthectomy, Dr. Lewis found that the patient still had hearing on that side. The tinnitus was no better. The most carefully conducted tests made by Dr. Duel confirmed this unusual finding.

Six months after the first operation a second was performed. Just before operation it was again demonstrated that the patient could repeat words shouted in the operated side, the unoperated side being stopped by a noise apparatus. At this operation the bone wax, which had been employed at the first operation to stop the flow of cerebro-spinal fluid, was removed from the cochlear cavity, which was apparently clear of any vestige of the cochlear apparatus. Thorough curettage of the cochlear cavity was performed, and the vestibula, which was entered from behind, and the ampullæ of the semicircular canals were destroyed. No bone wax was used on this occasion. The wound healed and was dry for several months at the time of the report.

The important phenomenon observed in this case might cause one to question the theory of Helmholtz with reference to functions of the labyrinth. Does it support that of Shambaugh? At any rate it should stimulate further investigations of the physiology of sound perception.

Dr. GEORGE E. SHAMBAUGH said that the first question of importance in this case was to determine the probable cause of the ear trouble. From the history of the case alone, deafness coming on insidiously in middle life, associated with annoying tinnitus, it would appear most likely to be one of otosclerosis. This at once offered a probable explanation for the most interesting feature, namely, that the patient appeared to hear in an ear where the cochlea had been completely destroyed. The explanation that suggested itself was this. In otosclerosis the symptom of paracusis willisi was usually very marked. In these cases it was not unusual for a patient who had great difficulty in hearing the voice, to find that in the presence of a noise, as, for example, on a railroad train, he could hear even better than a normal hearing individual. Now in the case here reported, where the cochlea in one ear had been destroyed, and a noise apparatus was applied to the opposite ear, it seemed not unlikely that through the phenomena of this paracusis willisi, the patient might be able to hear even where no

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hearing could be detected when the same test was applied to a normal ear.

The generally accepted view was that sound perception takes place exclusively in the cochlea. If this be true, then an injury, even less extensive than in this case, it would seem, must result in a total destruction of hearing in that ear. If it be true that the patient did actually hear in the operated ear, he believed it must be accepted that the perception took place in the vestibular apparatus. He did not believe that any theory of sound perception which placed this function in the cochlea would account for hearing in an ear which had been subjected to the operation performed by Dr. Duel.

The annoyance from tinnitus aurium was much greater in some cases than in others. Some of this difference was to be accounted for by the difference in the general nervous make-up of individuals. A subjective noise which would cause only moderate annoyance to one person would in another more nervous individual almost drive to suicide.

Dr. George W. MacKenzie thought it unfortunate that careful tests were not made before anything was done, as it might then have been determined whether the lesion was in the conducting or the perceptive apparatus. It was possible in nerve lesions to have tinnitus aurium. Two cases had been reported eight years ago, in the *Wiener Klin. Woch.*, by Dr. Alice V. MacKenzie, which were of syphilitic origin. He suggested that in Dr. Duel's case the condition was a post-syphilitic lesion. He did not believe the patient heard. He thought the combination of the speaking-tube method with the noise apparatus would have given a different result.

Dr. Fielding O. Lewis (Philadelphia), said the patient still insisted, with the use of the noise apparatus, that she could hear. Dr. Duel had made a handsome wager that she could not hear after the first operation, but by the careful tests described had demonstrated himself a loser, both to himself and all others present. After the ear became dry, following the second operation, the speaker had tested it again with the noise apparatus, and she still said she could hear sounds but could not determine words. He had her daughter, whom she could hear best, stand by her, without speaking, and the patient again insisted that she could hear sounds but not words. She had never had paracusis willisi. Wassermann test was negative, and she had been given iodides. Other tests were negative.

Dr. Duel, in closing, said the functional tests had been as elaborate as they could be made. If, as might be assumed, a portion of the cochlea had been left at the first operation, the wax, impinging upon that, might have carried the sound waves in, if Dr. Shambaugh's theory was correct. If a remnant of the cochlea had been left at the first operation it had probably been removed at the second. The curettage of the vestibule in the first operation had not been done as thoroughly as that of the cochlea. In the second the whole labyrinth had been removed. The point he raised was whether destruction of the cochlea destroyed hearing.

(To be continued.)

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