softened and broken-down brain-tissue was evacuated. For three or four days the temperature remained about normal, and the patient was conscious and sensible. The knee reflexes on both sides became very active. The temperature then began to rise. Headache was complained of. Lumbar puncture, which had been repeated at intervals, now gave turbid fluid. A counter opening was made in the occipital region into the cerebellar abscess. The patient became delirious, and died on December 3.

The case has several interesting features. The bone condition appears to have been an acute spreading osteomyelitis originating in an acute affection of the tympanum. The sinus became infected probably by way of a communicating vein as the wall contiguous to the bone was quite healthy.

Though there is no doubt that meningitis frequently results from sinus thrombosis this is the first time I have seen cerebro-spinal fluid actually flow into the sinus. No doubt the acuteness of the whole condition accounts for this; adhesions had not had an opportunity to form.

The destruction of the cerebellum was very extensive, and was probably caused by infection from several sources, the sinus and the communicating veins.

In view of the small focus of the disease found in the sinus I did not at that time open the upper part of the divided jugular. I had to do so later.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL SECTION.

November 17, 1916.

H. J. Marriage, *President of the Section, in the Chair.*

Chronic Adhesive Otitis: Myringotomy and Partial Ossiculectomy.—P. Watson-Williams.—Miss S. E——, aged twenty-six, came under observation in May, 1916, with deafness of several years' duration. Membrana dry, slightly opaque and thickened, only slight retraction, with dry adhesive catarrhal otitis. Rinne negative. She had been treated in 1914 by another aurist, who repeatedly inflated the middle ear during four months, and ordered a nasal douche for post-nasal catarrh.

When I saw her first she could hear whispered words uttered as loudly as possible (H.W.W.), right 28 in., left 20 in.; after Eustachian catheterisation (H.W.W.) right 54 in., left 36 in.

The maxillary antra and sphenoidal sinuses were explored by my suction syringe method, and muco-pus was found in the left sphenoidal sinus, which was opened on June 14, and at the same time the tonsils were enucleated. Subsequently repeated catheterisation improved the hearing to H.W.W., right 88 in., left 38 in.

On September 20, Gellé test proved positive; I was led to the conclusion that there was absence of stapedio-vestibular ankylosis,

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and crucial myringotomy was therefore performed under nitrous oxide gas anæsthesia, with a view to determine how far direct exposure of the oval window to sound waves would improve hearing. Immediately after recovering from the gas anæthesia the patient's H.W.W. was 7½ ft. (left). Apparently the middle ear was free from discharge, though naturally the bleeding prevented any careful inspection. Subsequently the patient developed a purulent otitis media, although every precaution had been observed with a view to rendering the auditory meatus aseptic. When this had subsided, the patient's H.W.W. was right 6 ft., left 24 ft. On October 17 the left membrana was more freely excised, and the lower half of the handle of the malleus removed, with the intention of making the perforation of the membrana permanent. The beneficial effect of the simple myringotomy has been maintained, and now after further catheterisation of the right Eustachian tube the H.W.W. is right 6 ft., left 24 ft. In other words, the so-called good ear is relatively the deaf ear, whereas the previously deafer ear has very useful hearing. Time will show whether the improvement, which is remarkable, will be permanent. The patient is submitted in the present stage with a view to opinion as to the desirability of deferring any similar measure on the right ear. It is suggested that the chronic dry adhesive catarrh of the middle ear on both sides was a latent infective process, without polynuclears, and probably due to the sinus infection. When the drum was incised, it was thought that the traumatism converted the latent into an active inflammatory infection, and it soon subsided under appropriate treatment.

It is open to anyone to say that the otitis purulenta was due to defective precautions having been taken in the way of prior disinfection, and in regard to instrumentation; but I took the usual precautions, and I do not think that was the explanation. I think it illustrates the point which has been emphasised by Mr. Fraser—namely, the possibility of a dry adhesive catarrh being a latent infection, which may pass on to a labyrinthine process resulting in otosclerosis. Another point I suggest is the desirability of investigating the condition of the nasal sinuses, especially the sphenoidal, in cases associated with infection in the middle ear. In all my mastoid cases I investigate the condition of the maxillary antrum and sphenoidal sinus, and I think some of our disappointing cases are due to infection of those sinuses.

The PRESIDENT: I should like later on to hear from Dr. Watson-Williams whether this patient's hearing remains good, or whether the present improvement was only temporary. I make this request because I have found so often in the treatment of these cases of chronic dry catarrh by operation, such as the removal of the drum and skin grafting, etc., that though the hearing improved for a time, afterwards sclerosis occurred, and the deafness became as marked as before.

Sir WILLIAM MILLIGAN: Dr. Watson-Williams is to be congratulated —at the moment at any rate—on a very excellent result; but we know these cases are apt to relapse. Many years ago I tried treatment more or less on the lines he followed in this case, but gave it up in disgust, because, although improvement took place and lasted a few months, I do not think I could name a case in which it persisted for over a year. Dr. Watson-Williams may still see the re-formation of a cicatricial

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membrane. It is true that amputation of a portion of the handle of the malleus militates against this, but, even so, I doubt if there will be permanent improvement. With regard to his explanation as to how the middle ear became infected, I regard it as far-fetched. No one can be quite certain of rendering the external meatus aseptic, and any one may have sepsis after such an operation—though I am sure Dr. Watson-Williams took all ordinary precautions. I do not think his conclusion that the middle ear was the seat of a latent infection is legitimate, because, according to Dr. Watson-Williams's own statement, when he opened the middle ear, it was quite dry. [Dr. WATSON-WILAIAMS: It appeared dry.] At any rate, there was no secretion, and no exudate visible. The patient had had sphenoidal sinusitis on that side, and post-nasal catarrh—perhaps the result of the former—so we have not far to look for the source of infection. There may have been infection of the Eustachian tube, and with manipulation the middle ear became infected *per tubam*. I used to think that part of the want of hearing in these "dry" ears was due to the lack of lubrication of the vesicular chain. The case is, however, a good example of at least the temporary value of myringotomy.

Mr. HERBERT TILLEY: Most of us remember the great boom, some twenty years ago, of this method of operating for chronic adhesive catarrh of the middle ear. Papers recording their experience were written by Dr. Burnett and Dr. Sexton, of New York, special instruments were devised by them, and many ossiculectomies were carried out as a result of their former experiences. I performed the operation on a number of hospital patients, and on a fewer number in private practice, having clearly explained to each of them that without treatment there was practically no cure, but that this operative method was stated to give great relief. I was allowed to try it on the bad ear, the feeling being that it could not make the hearing of that ear worse, and it might make it better. For a time, and in a few cases, there was gratifying improvement, but I did not have a single case in which it was permanent. For the last eighteen years I have abstained from operating for this type of deafness. I agree with Sir William Milligan as to the probable mode of infection of the ear in this case, but I do so from another point of view. I do not think anyone who has been interested in suppurative lesions of the nasal accessory sinuses can help being struck by the rarity of suppuration in the ears of these patients, even though the chances of infection are so manifold. If you take 100 cases of chronic suppurative otorrhœa, in only about five, if you search the sinuses, will you find suppurative lesions in them. I have published one striking case in which I unwittingly cured a patient's chronic suppurative otorrhœa by operating on his right maxillary antrum. He said the discharge in his ear had stopped, though it had continued for years. That is one of the few cases in which I remember there appeared to be any connection between the two lesions. I do not know why the ear should withstand infection in these suppurative nasal cases, unless it is due to auto-immunisation.

Dr. W. HILL: It is extraordinary how many men have taken up this method and then dropped it. Toynbee gave it up, not only because he obtained no great results, but because somebody got meningitis in a case from infection. Some of the ears in these cases will suppurate after puncture, whatever precautions you take: one need not go to the nasal cavities for reasons for this. When I first worked at otology

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I looked up the subject, and I had a communication from Prof. Politzer. When I saw him, and asked him about it, he said, "I have done it, but it is not a bit of good." Berthold, Schwartze, and Halle described improvements, and again in America the subject was taken up, as has been stated. Eighteen years ago, Dench, of America, published a large number of cases, and I think that in his book it will be seen that he recommends it now. But every one else whose opinion one values considers that the game is not worth the candle. The patients upon whom I have operated in two or three cases of the kind during the last ten years have been doctors' wives; probably their husbands had read up the subject and they were prepared to take the risk. I was very much gratified on one occasion by getting a result similar to that obtained by Dr. Watson-Williams, for directly the patient came from under the influence of the gas she exclaimed that she could hear, and expressed her great delight. This lasted for two days, and the good result was due to the blood having acted as an artificial tympanum. Then I tried glycerine, which seemed to act better, but later there was a relapse. Then the husband asked me to remove part of the drum membrane, with the malleus and the incus, which I did, and we used glycerine and wool as an artificial membrane. But the whole thing went back after a few months, and I think the last stage was worse than the first. There were many adhesions and impaction of the foot-plate of the stapes. In two or three cases the preliminary myringotomy improved the hearing very considerably indeed, but, on the whole, I have had no encouragement to go on with it. One operator, Faulder White, has written on this operation, and, I think, practises it at the present day, but I do not think he has any great following. I shall be glad should we find we can revise our judgment and our conclusions on this special subject, but I fear we shall be doomed to disappointment.

Dr. DUNDAS GRANT: I am afraid we do not know the conditions which lead some perforations to remain open when we want them to close, and others to close when we want them to remain open. As a rule, when a perforation persists, it is because the vitality of the patient, or that of the tympanic structures, is lowered, as happens in tuberculosis, scarlet fever, etc. It is difficult to say whether the fact of suppuration having occurred in Dr. Watson-Williams's case favoured the persistence of the opening, but perhaps that furnishes an indication of means of keeping perforations open. With regard to the reason why the infection should have occurred, if we regard it from the physical standpoint, we see that the mechanical conditions are entirely changed in the tympanic cavity when one opens the tympanic membrane: the pressure is different from what it is when the membrane is whole. Thus, when we force air up through the tube in blowing the nose, we are certain to produce increased compression of air in the tympanic cavity, without solid particles necessarily finding their way up. But when an opening is made in the tympanic membrane, actual material, or at all events microbic contents from the naso-pharynx will be driven up. In the same way the tympanic cavity will often drain much better through the Eustachian tube when a perforation has been made in the membrane, just as when a pipette already full is to be emptied, one has only to remove one's finger from the orifice for the fluid to run out. In this way it is easy for infection to have occurred here, even though Dr. Watson-Williams's asepsis in the meatus may have been perfect. A writer in the *Monatsschrift für Ohrenheilkunde*

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professed to keep perforations open by repeatedly injecting liquid vaseline up the Eustachian tube, until it ran out through the perforation. I tried it, and I think it kept a perforation open for some time, but I could not maintain the treatment long enough to judge of its permanency. I congratulate Dr. Watson-Williams on his good result, so far.

Dr. URBAN PRITCHARD: May I go further back in the history of this matter, and remind you that Sir Astley Cooper began this operation for deafness? He happened to perforate a membrane, and got this result. Then it healed up, and, of course, he had done no good. He had so many patients rushing to consult him after that case, that at last he refused to see any deaf patients at all. I am a pessimist as regards this operation. I have seen so many measures tried that I do not think we shall ever arrive at anything like permanent success. This excellent case of Dr. Watson-Williams' is a little spoilt because of the suppuration. If you get suppuration, and thereby permanence, you may get some lasting good. Then there are all the dangers of suppuration. I think that in six months' time this case will be *in statu quo*.

Mr. SYDNEY SCOTT: I would even go a step further than Prof. Urban Pritchard, and warn aspiring performers of this operation that the *ultimate* effect on hearing may be that the hearing becomes worse than it was previous to the operation, in spite of marked temporary improvement. Dr. Watson-Williams has wisely borne this possibility in mind by operating on a patient with *unilateral* deafness. Deplorable consequences were known to have followed this procedure when applied to both sides. I think we should like to know what the condition is, say, this time next year.

Dr. P. WATSON-WILLIAMS (in reply): I wish to thank members for the interest they have shown and the remarks they have made. I feel with them the need for great caution in accepting results until time has shown what the ultimate effect may be. The patient improved before there was any time for suppuration to influence the result: the improvement was so immediate that it could not have been due to suppuration; still, subsequent further improvement might be due to the suppurative process. With regard to Mr. Tilley's point, that he has seen many cases without infection of the ear, I would say that there a good many cases of otitis media, especially the suppurative form, in which, if investigated, we should find the sinuses infected. I have had cases of acute mastoiditis in which cure resulted from operating on the sinuses, the ear being left alone. When the chief trouble is in the ear itself, our attention is not often enough drawn to the sinuses. I agree with Mr. Scott's point, though in this patient it is hardly a moot question as to whether the patient will be worse for the operative procedure than if one had left her alone. I chose the worse ear for operation first, and I told the patient and her parents that I could not guarantee anything at all, and that they must be prepared to take it for what it was worth. In spite of the gratification of the patient, I have refused to operate on the other ear until time has shown that the result in the ear operated upon is completely satisfactory. I shall be glad to bring the result before the Section after the lapse of further time. I have no note of any tinnitus before the operation, and I do not think there is any now.

A Further Case of Otosclerosis associated with Otitis Media.—J. S. Fraser.—At the meeting of this Section in May I showed a

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case of otosclerosis associated with chronic purulent otitis media and cholesteatoma. You may remember that the microscopic examination was rather incomplete, because the region of the oval and round windows had been destroyed by a saw cut. I now wish to demonstrate another case in which I have a complete series of microscopic preparations from both ears.

The patient was a woman who died on January 4, 1916, at the age of sixty-three. She was married in 1881, and her husband tells me that

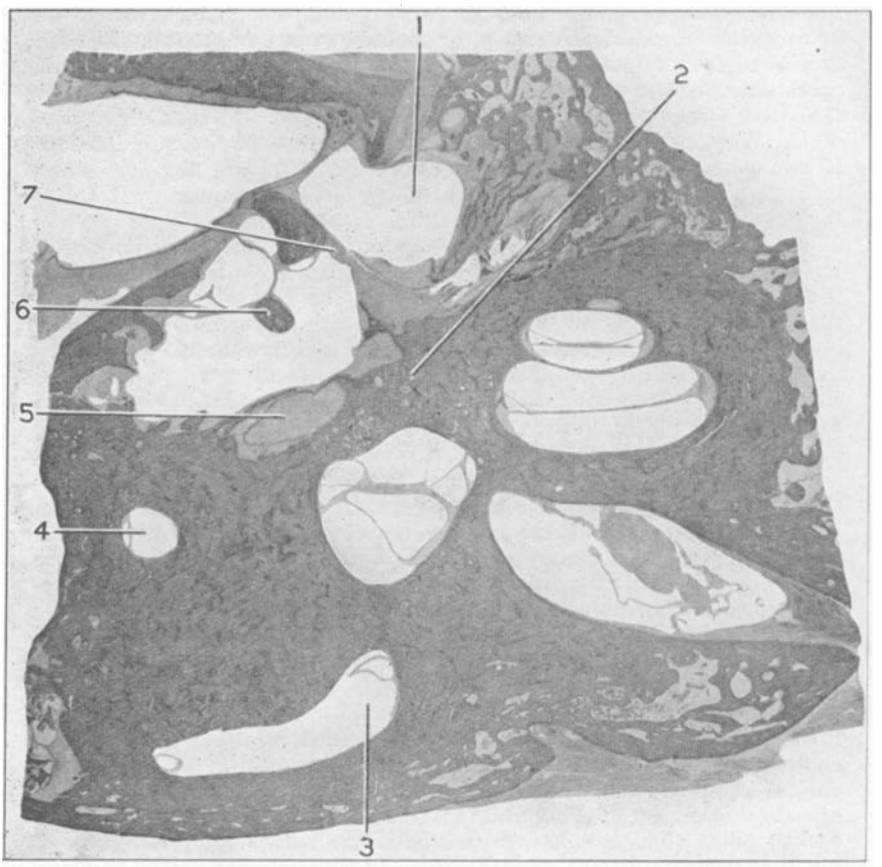


FIG. 1.—Otosclerosis associated with otitis media. A. W——, female, aged sixty-three. Horizontal section through right ear. No. 180.—1. Anterior or tubal portion of tympanum. 2. Area of ostitis vasculosa (otosclerosis) just above level of oval window. 3. Crus commune. 4. Lateral canal. 5. Facial nerve. 6. Incus. 7. Tendon of tensor tympani attached to malleus. (× 6.)

she was very deaf at this time. The patient attributed her deafness to an attack of scarlet fever in childhood. Both she and her brother had scarlet fever and otorrhœa at the same time. Her brother recovered his hearing, but the patients gradually became deaf. Her husband informs me that she always had a purulent discharge from the left ear

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and complained of severe tinnitus like the roaring of the sea. The noises also had at times a "beating" character. She sometimes complained of dizziness. As far as her husband knows there was no deafness in the patient's family. I have been unable to obtain definite information with regard to the presence of paracousis, but her husband thinks that she did hear better in a noise. The patient visited the Royal Infirmary about fifteen years ago, and also attended the Eye and Ear Hospital, Cambridge Street, Edinburgh, and had the Eustachian

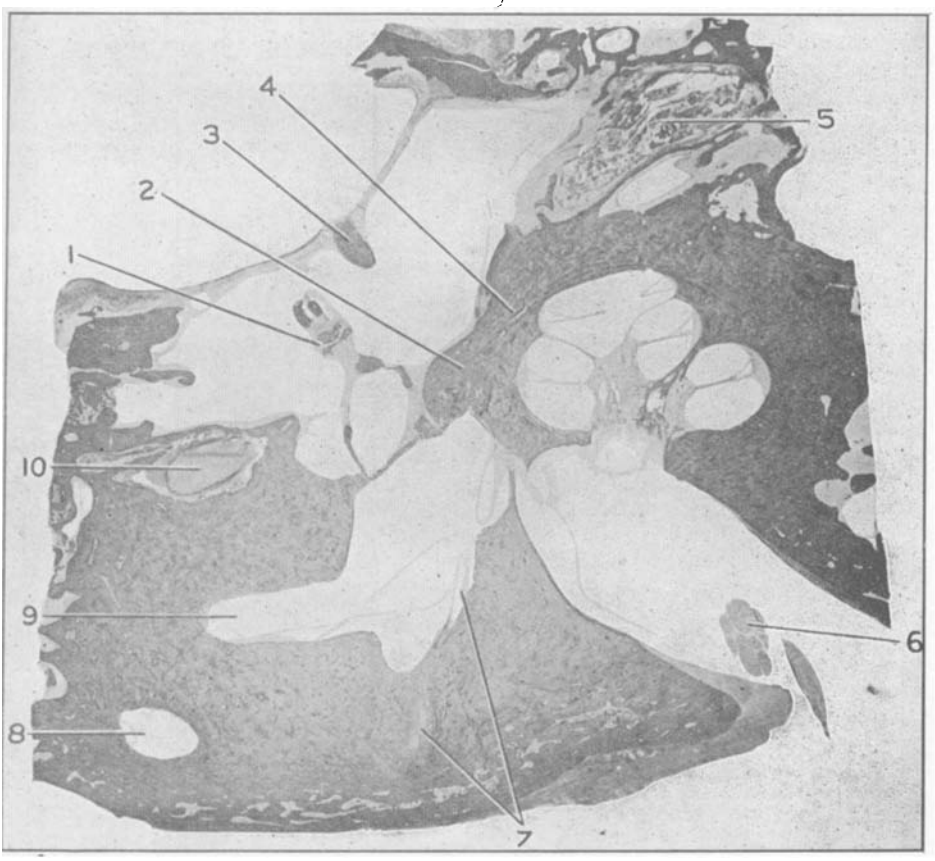


Fig. 2.—Otosclerosis associated with otitis media. A. W——, female, aged sixty-three. Horizontal section through right ear in region of oval window. No. 250.—1. Joint between incus and stapes. 2. Area of ostitis vasculosa in anterior margin of oval window. 3. Handle of malleus. 4. Ostitis vasculosa spreads in cochlear capsule between cartilage and lamellar bones. 5. Tensor tympani. 6. Facial nerve; the eighth nerve is absent (artefact). 7. Two parts of endolymphatic duct. 8. Posterior canal. 9. Smooth end of lateral canal joins vestibule. 10. Facial nerve, (× 6.)

catheter passed. So far I have not been able to obtain any report regarding the functional examination of the ear. Except for attacks of eczema the patient appears to have enjoyed good health. The husband tells me that the patient had one child before marriage and that after

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marriage there was one miscarriage. For three years before her death she was an inmate of the Poorhouse at Craiglockhart, to which she was admitted on March 26, 1913. She suffered from gangrene of the left foot for a short time before death; the temperature was raised for the last fourteen days. *Post-mortem* examination revealed cerebral softening.

Microscopical Examination of Right Ear.

(1) The right external meatus is normal, but the drumhead is slightly thickened in the posterior part—possibly the result of former otitis media.

(2) *Middle Ear.*—The tubal part of the tympanic cavity appears

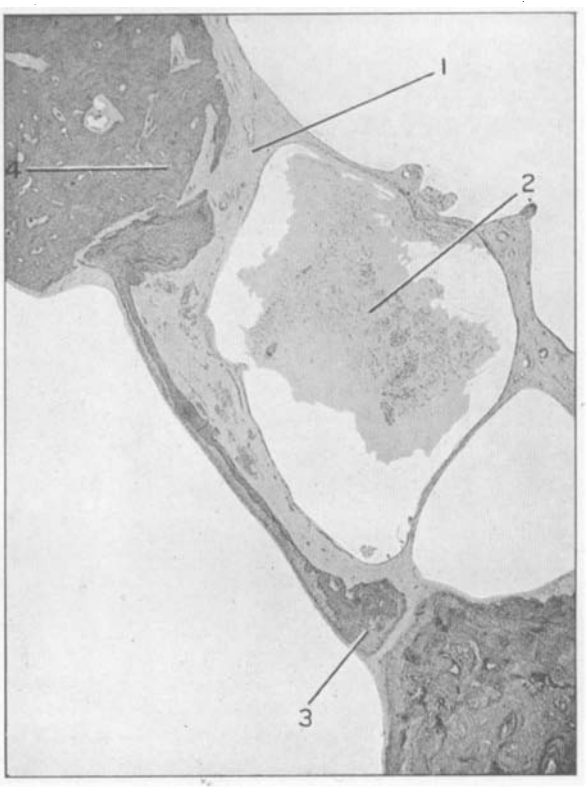


FIG. 3.—Otosclerosis associated with otitis media. A. W——, female, aged sixty-three. Horizontal section through right ear. No. 220.—1. Thickened mucosa of anterior margin of oval window. 2. Mucopurulent exudate in hollow of stapes. 3. Posterior part of footplate. 4. Region of ankylosis between stapes and oval window. Note the inflammatory process invading the anterior bony margin of the oval window from the deep layer of the swollen mucosa. (× 25.)

to be wide. The mucous membrane of the tympanic cavity appears normal, except in the region of the oval window where the submucosa is thickened, congested, and œdematous. The round window is healthy, and the malleus and incus are normal. The stapes is ankylosed by bone to the anterior margin of the oval window. In the roof of the tympanic cavity the marrow spaces are congested and, where they

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lie next to the Eustachian tube, they show leucoblastic reaction or fibrous tissue. The tympanic muscles appear to be healthy.

(3) *Labyrinth Capsule.*—Above the level of the oval window there is an area of osteoporosis or ostitis vasculosa. Engorged vessels are seen entering this area from the deep layer of the swollen tympanic mucosa. The ostitis vasculosa shows a tendency to extend forward into the cochlear capsule between the cartilage and lamellar bone.

(4) *Labyrinth Contents.*—(*a*) Cochlea: Corti's organ is fairly well formed in the middle and upper coils, but the hair cells are not recognisable. In the lower coil the auditory papilla is not so well formed, but this is not unusual. There appears to be some shrinkage

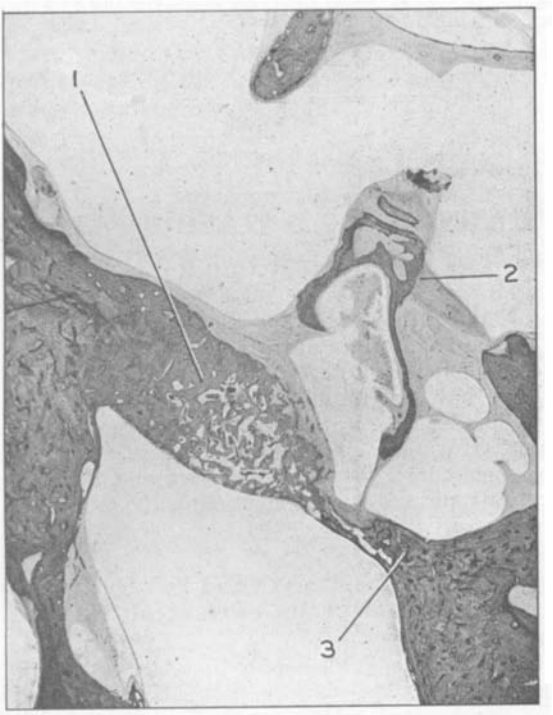


FIG. 4.—Otosclerosis associated with otitis media. A. W — , female, aged sixty-three. Horizontal section through right ear. No. 265.—1. Area of ostitis vasculosa in anterior and lower margin of oval window. 2. Tendon of stapedius attached to head of stapes. 3. Split in bone of posterior margin of window (artefrct). (× 12.)

of the cells of the spiral ganglion, especially in the basal coil, and slight small cell infiltration of the ganglion, but these changes are too slight and indefinite to have stress laid upon them. (*b*) Vestibule: The otolith membrane of the utricle is separated from the neuro-epithelium, but otherwise the vestibular structures appear to be healthy. The lining membrane of the saccus endo-lymphaticus shows a peculiar appearance—the connective-tissue beneath the epithelium lining being thrown into polypoid folds. (*c*) Canals: The cristæ of the canals are not so prominent as usual, but otherwise there is nothing to note.

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(5) *Internal Meatus.*—The eighth nerve has unfortunately been torn out in the removal of the specimen. The seventh nerve appears to be normal.

Summary.

There are slight evidences of an inflammatory change in the marrow spaces in the roof of the Eustachian tube and also in the mucosa lining the niche of the oval window. Elsewhere the middle-ear structures are normal. The stapes is ankylosed to the anterior margin of the oval window, and the bone in this region shows marked osteoporosis which extends forward for a slight distance into the capsule of the cochlea. Considering the age of the patient, the nerve structures of the nner ear may be considered to be practically normal.

(*To be continued.*)

Abstracts.

PHARYNX AND NASO-PHARYNX.

Cartilage and Bone in Tonsils.—Grove, W. E. "Annals of Otology, etc.," xxv, 417.

According to the author, the occurrence of cartilage and bone in the tonsil is not uncommon. It is always near the capsule or in the connective tissue framework and never invades the lymphoid tissue. He is inclined to think that bone found is never true osseous tissue, but due to calcification of pre-existing cartilage. Discussing the origin of these abnormal finds, Grove considers it more logical to explain them as a metaplasia or metamorphosis of connective tissue, due to inflammatory hypertrophic or atrophic regressive changes in the tonsil.

Macleod Yearsley.

The Correlated Action of the Pharynx and Soft Palate, and its Effects upon Post-nasal Diagnosis.—Greenfield Sluder. "Annals of Otology, etc.," xxiv, p. 134.

The effect of "gagging" in distributing the secretions in the nose and naso-pharynx is the object of the thoughtful paper, which requires to be read in the original. The practical application of the author's observations lies in the way in which gagging may deceive the surgeon in his examination. *Macleod Yearsley.*

NOSE.

Air and Rhinitis.—Wurtz, W. J. "Annals of Otology, etc.," xxv, 425.

Discusses the influence of hygiene—of body, home, schools, and other public buildings—in the ætiology of "cold in the head." Whilst going into temperature, humidity, *et hoc genus omne*, the author appears completely to ignore the occurrence of infection, and one cannot but admire the complete and skilful way in which he has all mention of bacterial sources of rhinitis. *Macleod Yearsley.*

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