SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTION OF LARYNGOLOGY

November 2, 1923.

Notes on Fourteen Cases of Intrinsic Cancer of the Larynx —J. S. FRASER, M.B., F.R.C.S. Ed., and DONALD WATSON, M.B., F.R.C.S. Eng.—(Paper published in the *Journal of Laryngology and Otology*, February 1924, p. 79.)

DISCUSSION.

Mr H. TILLEY (referring to Mr Fraser's remarks as to the opinion expressed in America as regards the wisdom of removing a piece of growth for microscopical examination) said he, the speaker, agreed that the less one did to the growth before the actual operation, the better. In fact, he thought it would be better to make a mistake in the diagnosis and find the case was not epithelioma, than to interfere with the latter before the operation. This opinion turned on what was considered to be the true pathology of cancer. He thought these tumours should be regarded as an unnatural form of growth which, during its period of activity, produced a certain amount of immunity. When the growth was removed, the immunity lasted a certain time, and when it was exhausted there was a recurrence somewhere, if the patient lived long enough. From that point of view the saying: "Once cancer, always cancer," had something in it.

Last May he saw a gentleman, aged 78, whose left vocal cord he (Mr Tilley) had removed seventeen years previously for malignant disease. During that time he had been using his voice in addressing public meetings and carrying on his profession as a solicitor, and his health had been very good. When the recurrence took place, it was in the scar which had been left from the operation seventeen years before. He thought the conclusion was irresistible that at the operation some small element of cancerous growth had been left behind.

In another case, fourteen years previously, he had removed an epithelioma from the right vocal cord, and at the end of that period a little nodule recurred in the scar of the incision in the neck. After operation there was again freedom for two years, and then infiltration occurred widely in the scar and its immediate neighbourhood, and the patient died. At the operation he felt that he must have left some small cancer cells in the neck wound, but that they were inert while the immunity lasted. Therefore he felt that the less interference there was before the operation the better, in order not to disseminate any particles of the growth.

Professor BURGER said that last week he saw a man, now over 80 years of age, who, twenty-three years ago, had carcinoma. Last week he came back with recurrence on both sides. In that case Mr Tilley's suggestion of immunity did not help, as twenty-three years was too long a period for such immunity to exist.

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Royal Society of Medicine

Sir ST CLAIR THOMSON said he had a case on which he did laryngofissure, and the growth removed proved to be epithelioma. Within six or eight months the patient's larynx became infiltrated again, and after consultation with Sir Henry Butlin, he removed the entire larynx. He had sections cut and, to his horror, there was no evidence of carcinoma! Yet the man lived seven years, and then died of recurrence of cancer in the glands of the neck. He did not see how infection from the original neoplasm had been brought about. The man was a syphilitic, a fact which had much to do with the condition. In Mr Fraser's series, those who had syphilis and those who had tubercle did badly.

The operation was very successful when the disease was limited to the vocal cord or to its edge. It was interesting to see in how many the disease extended to the thyroid cartilage, although one could not recognise this beforehand. For that reason he had for ten years been removing the thyroid cartilage. The sections also showed that the most dangerous cases of intrinsic cancer were those in which the growth was subglottic, as it tended to spread through between the thyroid and the cricoid cartilages. The subglottic cases did not come for examination until the disease was well advanced. He (Sir St Clair Thomson) approved of removing a piece for examination beforehand if a satisfactory piece was removable, as in a few cases with papillomatous projections. But he agreed with Mr Tilley that wherever possible a positive diagnosis should be made before doing the operation. In the majority of cases, however, one had to depend upon clinical knowledge, and upon being able to exclude every other possible cause of chronic infiltration, *i.e.* chiefly syphilis and tubercle. But in subglottic cases—where preliminary examination was wanted most of all—it was impossible to remove a piece for this purpose. He had seen a number of cases in which removal of a piece had been unsatisfactory.

Sir JAMES DUNDAS-GRANT endorsed what Sir St Clair Thomson said about the advisability of removing a piece for examination, when removable; he had seen cases in which a diagnosis could not be made without this being done. Tuberculosis often simulated carcinoma, and, more often, carcinoma simulated tuberculosis. The removal made an early diagnosis possible, and he did not think it rendered the patient any worse. He did his best to sear the cut surface with the galvano-cautery, to close the lymphatics and check the escape of cancer cells.

Dr JOBSON HORNE said that in order to be able to base a positive diagnosis of malignant disease of the larynx upon the microscopist's report on a piece of the growth removed for the purpose, the piece must be removed in a particular manner and the section must also be cut in a particular manner. He was opposed to the methods commonly followed. It were better that at the operation there should be present an expert histologist and section-cutter, who could cut a section and examine and report there and then. That was done in connection with the removal of growths in other parts of the body. The surgeon could then proceed to operate accordingly. The more he saw of these cases, the more the removal of a piece from the larynx, before an operation had been planned, seemed to him meddlesome interference. The healing of the raw surface after

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the removal of a piece for diagnosis before an operation—as practised by Sir James Dundas-Grant—Dr Jobson Horne was opposed to, for, if there were a tendency to the development of epithelioma, such a procedure would put the seal upon it.

Dr SYME agreed with Mr Fraser as to the desirability of removing a piece of growth for examination. If he could, he would do it in every case before thyrotomy. In many cases in which it was impossible to get a piece away by the indirect method, it could be done with the aid of the suspension apparatus. Several times he had opened the larynx to find that the condition was not epithelioma, and he did not think the opening of the larynx was so free from danger as some of his colleagues considered it to be. He could not see any difference between taking a piece of growth two or three days before operating, or doing so just before dealing with the condition operatively. A definite opinion on such an important matter was very desirable.

Mr J. S. FRASER (in reply) said he found in New York that Mackenty was not doing thyrotomy, but was removing the whole larynx in every case of intrinsic malignant disease. There might be some reason for refraining from removing a piece for microscopic examination if one was only going to perform thyrotomy, but if it was proposed to take away the whole larynx, it was necessary to be very certain beforehand. With regard to recurrence, one of his patients had a "recurrence" (?) of cancer seven years after the larynx was extirpated, but in this case the "recurrence" was in the cervix uteri. Mr Fraser did not regard the second cancer as having any relation to the larynx. It only showed that the patient was predisposed to cancer.

SECTION OF OTOLOGY

President—Mr SYDNEY SCOTT, M.S.

November 3, 1923.

Congenital Deafness in a Dog—J. S. FRASER, M.B.—The pathological conditions found in this congenitally deaf white bull-terrier pup are almost exactly the same as those found in a congenitally deaf boy* shown before the Section in May 1921. Briefly, they are as follows:—

Middle ear and labyrinth capsule, utricle and canals normal; cochlear and vestibular nerves and ganglia normal; collapse of the cochlear duct and of the saccule; adhesion of Reissner's membrane to basilar membrane; Corti's organ replaced by an irregular arrangement of cells; colloid bodies in cochlear canal; membrana tectoria tucked into internal spiral sulcus; connective tissue in cochlear aqueduct (Figs. 1 to 8).

Alexander has examined a deaf albinotic cat and found changes

* *Journal of Laryngology and Otology*, 1922, pp. 13 and 57.

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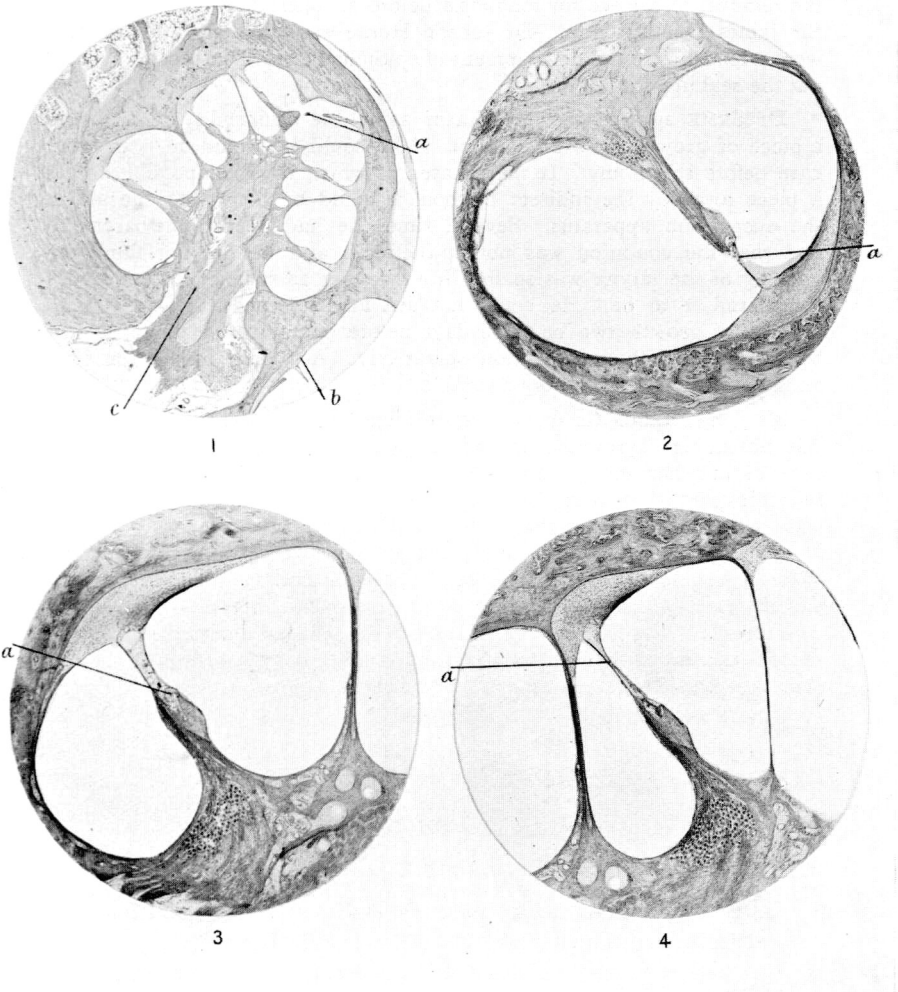


FIG. 1.—Horizontal axial section through right cochlea of congenitally deaf white bull-terrier pup. Section 120 × 10 diameter. Note that the bony cochlear capsule and modiolus are normally formed. *a*, Helicotrema; *b*, Collapsed saccule; *c*, Normal cochlear nerve.

FIG. 2.—Horizontal section through lower part of basal coil of right cochlea. Section 150 × 30 diameter. *a*, Collapsed cochlear duct. Note that the spiral ganglion and nerve are normal.

FIG. 3.—Horizontal section through upper part of basal coil. Section 150 × 42 diameter. *a*, Membrana tectoria tucked into internal spiral sulcus. The cochlear duct is collapsed and Corti's organ malformed.

FIG. 4.—Horizontal section through upper part of middle coil. Section 150 × 45 diameter. *a*, Complete collapse of cochlear duct, Reissner's membrane being adherent to the basilar membrane. The membrana tectoria as in Fig. 3. Note well-developed ganglion cells.

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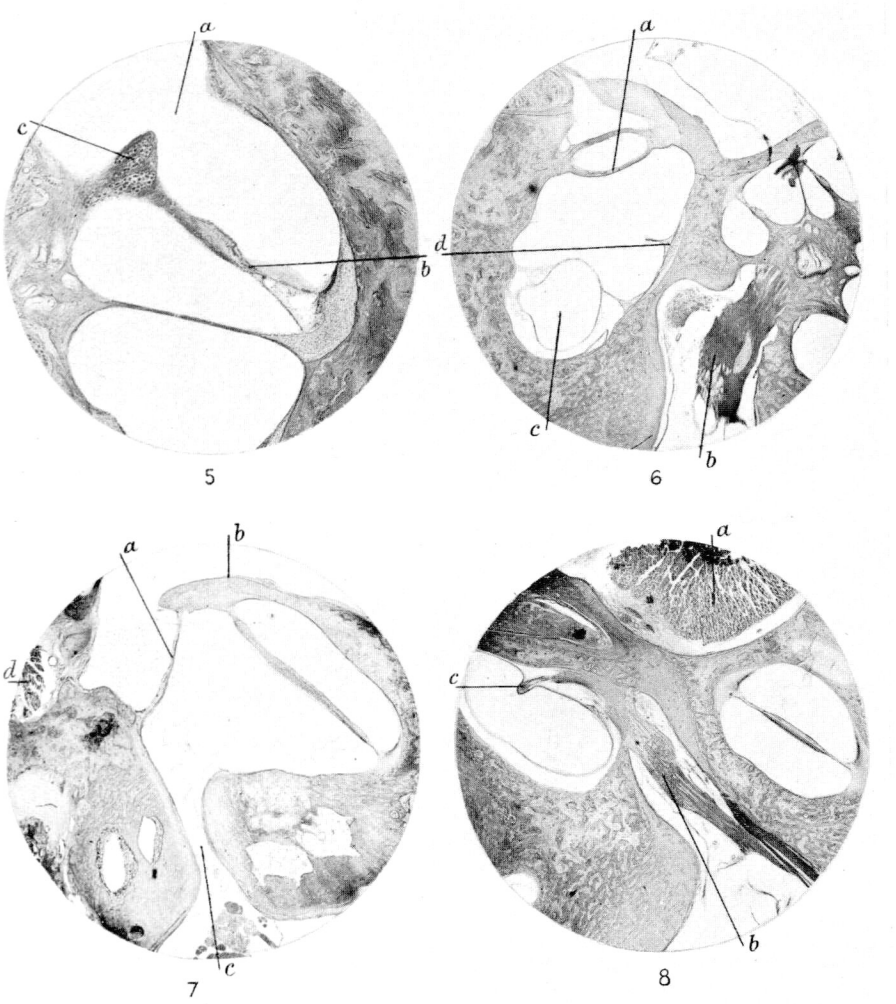


Fig. 5.—Horizontal section through apical coil of right ear. Section 150 × 45 diameter. *a*, Helicotrema; *b*, Membrana tectoria adherent to basilar membrane; *c*, Apex of modiolus, with well-developed ganglion cells.

Fig. 6.—Horizontal section through vestibule and oval window of right ear. Section 140 × 10 diameter. *a*, Footplate of stapes; *b*, Well-developed cochlear nerve; *c*, Utricle showing normal lumen; *d*, Collapsed saccule.

Fig. 7.—Horizontal section through region of round window. Section 220 × 10 diameter. *a*, Secondary tympanic membrane; *b*, Promontory; *c*, Aqueduct of cochlea, partially filled up by connective tissue.

Fig. 8.—Horizontal section through right ear in region of ampulla of lateral canal. Section 105 × 10 diameter. *a*, Tensor tympani muscle; *b*, Well-developed vestibular ganglion and nerve; *c*, Normal crista of lateral canal.

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similar to those seen in the present case. Beyer has found similar changes in two albinotic cats and an albinotic dog. Alexander and Tandler have examined three dogs and twelve cats, with much the same results. They also examined four young cats, born of deaf mothers; two of them showed changes typical of congenital deafness, the other two being normal.

Ruttin examined an albinotic deaf dog and found the aqueduct of the cochlea filled with connective tissue—probably the remains of fœtal connective tissue. In all these cases the changes are similar to those in Scheibe's type of deaf-mutism.

We cannot breed human beings to order, but we can breed animals. Is it not possible to get funds to start a research into congenital deafness in animals and its hereditary transmission, seeing that the changes are the same in human beings as in cats and dogs? We would then know if Dr Kerr Love's views as to the application of Mendelian laws to sporadic congenital deafness were correct. Alexander has observed a pair of cats, of which the mother was deaf and the father normal—about half the kittens were deaf. The changes in cases of congenital deafness are due to faulty development and not to intra-uterine meningitis, as Siebenmann and Nager believe.

The conditions present in the case I have shown are not the same as those found in dancing or waltzing mice. It is true that dancing mice are quite deaf, but they also have a deficient power of balancing. They have a broad-based gait and run in zigzag lines or turn round a vertical axis passing through the middle of the body. Dancing mice do not react to rotation like normal mice, but they react normally to galvanism. In dancing mice there are changes in the neuro-epithelium, especially in the pars inferior (cochlea and saccule), but the main changes are in the nerve ganglia of Scarpa and Corti, and in the nerves. The changes in the peripheral sense organ are regarded as being secondary to those in the ganglia. The utricle and cristæ of the canals are normal in dancing mice, but the macula of the saccule shows atrophy. Gray has found the semicircular canals normal in dancing mice, and agrees with Alexander and Tandler as to the nerve changes.

There are several grades of congenital change in the inner ear which may produce deafness. (The same conditions are seen in cases of cleft palate and hare-lip. In the slightest cases of this congenital abnormality we have a bifid uvula; in the worst cases the whole palate is cleft and a hare-lip is also present.) In the same way, in the slightest cases of congenital deaf-mutism the maldevelopment affects only the ductus cochlearis; in the second grade the ductus cochlearis and the saccule are involved; in the third case the whole membranous labyrinth is affected, though the changes are more marked

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in the pars inferior than in the pars superior. [This is in accordance with what we know of the comparative anatomy of the labyrinth, *i.e.*, the much greater age of the static as compared with the acoustic labyrinth. The cochlear duct develops later than the vestibular portion of the membranous labyrinth. The epithelial lining of the cochlear duct is still undifferentiated at a period at which the macula and cristæ are already well formed (Keith).] In still more marked cases of congenital maldevelopment the bony labyrinth may also be involved, especially that of the cochlea. The cochlea develops from base to apex, and therefore changes are more marked at the apex. Here the bony partition which should divide one scala from another may be absent, especially towards the apex of the cochlea, with the result that a "scala communis" is found. Finally, the whole labyrinth —bony and membranous—may be absent as in Michel's case.

The following questions call for elucidation: At what stage of development do the changes set in? What is the cause of the faulty formation? Alexander holds that a deficiency in the vascular supply *i.e.*, the stria vascularis, is an important cause of the changes in the cochlea. Lastly, the relation of pigmentation, or rather "the absence of pigmentation," to congenital deafness requires to be studied.

The writer is indebted to the Carnegie Trust for a grant in payment of the illustrations.

THE PRESIDENT said that in this valuable demonstration Mr Fraser had clearly shown that lesions in the congenitally deaf dog and child were visible in the region of the stria vascularis, and apparently that the disease was limited to this part of the membranous labyrinth. The contraction of the duct of the cochlea was probably the result of the failure of secretion by the stria vascularis, which he regarded as analogous to the choroid plexus.

Dr ALBERT GRAY said that he had never examined a deaf dog's cochlea, but he had been told by veterinary surgeons that deaf dogs were far more common than deaf horses. He had examined sections from an albino cat, and they were very similar to those shown by Mr Fraser to-day. He considered that the lesion was confined to the ductus cochlearis. The organ of Corti was flattened, and the tectorial membrane was rolled over it. With regard to the wide aqueduct of the cochlea, he did not think that was pathological. There was a popular fallacy that the aqueduct of the cochlea was a narrow tube. It was narrow in the human subject, but wide in such animals as the carnivora and others.

With regard to the relationship of these cases of deafness to inheritance, it was desirable to try to correlate inherited troubles with Mendel's law. But with complex structures, such as the ear, it was a difficult matter.

Professor HOBDAY said that congenital deafness in bull-terriers was well known to veterinarians. They had no remedy for it. Quite expensive dogs were bought without any suspicion that they might be deaf. To test this point in a dog it was the custom to drop a book or other heavy article unexpectedly behind the dog, and notice whether any response followed.

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The condition was especially frequent in white cats and dogs, particularly in the bull-terrier breed and the white Persian cat ; also in white rabbits, Angoras especially. He hoped Mr Fraser would continue his investigations ; it was another instance which illustrated the importance of the study of the comparative aspect of disease, and the help to be derived from a mutual study.

Dr DAN M'KENZIE said the question of the pigmentation in sense organs was of peculiar interest and mystery. It was fully discussed by William Ogle in the *Medico-Chirurgical Transactions* for 1878. Little knowledge on the subject had been added since that time.

Mr J. S. FRASER (in reply) said that Siebenmann and Nager had stated that the cases of sporadic congenital deafness were due to fœtal meningitis. He (the speaker) did not see how intra-uterine meningitis could account for these conditions, as the otic vesicle developed from the surface, and was only met by the nerves coming from the brain side. Why the meningitis should be confined to the cochlea and saccule, leaving out the other parts, was difficult to explain. With regard to the connective tissue in the ductus cochlearis, Ruttin regarded it as the remains of fœtal tissue, and probably he was right. In the early stage of the fœtus, the perilymph space was full of fœtal connective tissue, but it disappeared from the scala vestibuli and the scala tympani, and in the region of the aqueduct and cochlea.

In answer to Professor Hobday, Mr Fraser stated that in Edinburgh there was a department which was investigating the question of heredity, and a day or two before coming to London, he had a letter from the head of the department, Dr Crew, who had asked him to take part in an investigation on this question. He hoped, therefore, on a future occasion, he would have some more material to bring before the Section.

Otoliths of Fishes—Mr G. ALLAN FROST.—There are many types of otoliths, and it is possible to follow the course of their development from the simpler to the more highly specialised forms.

Aberrant forms occur in some species, and, in other cases, there is an affinity of the otoliths in *genera* not closely related; this may be due to parallelism or to reversion to an earlier type.

In teleostean fishes each labyrinth contains three otoliths, the *sagitta*, the *asteriscus*, and the *lapullus*, one always being more fully developed than the others.

Where the sagitta is the most developed, a groove on the inner side, the *sulcus acusticus*, is an important feature, the form it takes enabling us to identify the otoliths of living and fossil fishes.

[A comparison of the sulcus in the various groups was illustrated by diagrams and specimens shown on the screen.]

Mr SYDNEY SCOTT (President) in the name of the Section, thanked Mr Allan Frost for the interesting demonstration of his beautiful and wonderful collection. He (Mr Scott) thought that Mr Frost's work would stimulate further research into the anatomy and functions of the otoliths in connection with the various tonic reflexes which were now receiving attention.

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Mr TILLEY said that Mr Frost had remarked that one of the functions of the otoliths was in connection with hearing. As a fisherman, he (Mr Tilley) had been greatly impressed by the acuteness of sight of fish, but he did not feel convinced that fish were able to hear. A noise on the river bank, if it did not communicate vibrations to the water, left fish undisturbed, but immediately the water was struck with a "line" or other object, there was a commotion among its inhabitants.

Mr O'MALLEY said he was interested in the subject from the standpoint of the evolution of the labyrinth; several writers, especially Sir Arthur Keith, said that most observers who had written on the subject of the labyrinth believed that fish did not hear.

Dr ALBERT GRAY said that in many fishes if the labyrinth was opened, there was found a large otolith, and the fluid which came out, *i.e.*, the endolymph, was sticky, almost like gelatine. He asked whether Mr Frost could say what was the consistency of the endolymph in the fishes he dealt with. He (the speaker) wondered whether the gelatinous envelope surrounding the otoconia of mammals was not morphologically a remnant of this glycerine-like substance, which in many fishes spread through the whole labyrinth.

Mr A. R. TWEEDIE said he presumed that the "sulcus" to which Mr Frost referred was only of functional importance in reference to its representation of the underlying neuro-epithelium. He (the speaker) asked what was the comparative size of the various otoliths in a fish, and in different species of fishes. One would expect from the recent experimental work carried out in Utrecht that the sagitta would be the largest, the lapullus the next in size, and the asteriscus the smallest.

From the same experiments in Holland one would be led to believe that the sagittæ (*i.e.*, the *sacculi*) had a function which presided over, so to speak, the rolling of the ship, the lapulli (*i.e.*, the *utriculi*) being concerned with its pitching, and the asterisci (*i.e.*, the *lagenæ*) acting in some way as a depth indicator. Could Mr Frost say anything about the relation of the innervation of the lateral line to the nerves supplying the sensory epithelium in connection with the otoliths? Was the lateral line supplied by the eighth nerve? Did Mr Frost regard the lateral line as a receptive organ for vibratory sensation?

Sir JAMES DUNDAS-GRANT said that the late Sir George Savage had told him that in a certain piece of water the fish never rose on week-days, but they did so on Sunday, when the church bells rang and no fishermen were about. On Good Friday the church bells rang and the fish rose to Sir George's fly. He, therefore, assumed that the fish could hear.

Mr G. J. JENKINS said that the real point in the discussion was, what was understood by "hearing"? Where did ordinary sensation end and where did hearing begin?

Mr WILKINSON said that in some lower organisms such as jelly-fish, some of the primitive organs which were supposed to be for hearing contained small solid bodies, like otoliths. In the earliest forms of hearing organs there must be some connection between the presence of otoliths or a solid concretion, and the sense of hearing. In the case of creatures

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living in water, a solid body would act like the clapper of a bell, and the animal, with its hearing organ, would vibrate. It was extraordinary that the labyrinth and the hearing organ should have been developed in connection with one another. He thought there was something in the original connection between the otolith and the vibratory sense, which might explain the after-development of the static organ and the organ of hearing in conjunction with one another. There seemed to be no evidence that in the higher types of animal the otolith served any purpose in connection with hearing.

Mr SYDNEY SCOTT (President) said that Isaac Walton had discussed the subject of hearing in fishes.

Mr ALLAN FROST (in reply) said his opinion had always been that fish could hear, but he felt diffident about saying so in the present assembly. He agreed with Mr Jenkins that the question was, where did hearing begin and ordinary perception of vibrations end? It had been said that the carp had been known to come for meals when a bell was rung. In the case of the Beryx which lived at 350 fathoms, the large plate-like otolith must be very susceptible to vibrations.

In answer to Dr Gray, the endolymph seemed to vary in the different fish; sometimes it was very thin, in others its consistency was thicker than that of glycerine. As to the size of the otoliths, the sagitta was usually the largest, the asteriscus was small and frail, and the lapullus about the same size but stouter. With regard to the lateral organs, Professor Bridge had stated that there were independent nerve fibres, which returned from these organs to the tuber acusticum, in which the auditory nerve had its root.

Case illustrating Digital Compression of the Vertebral Arteries for Pulsating Tinnitus—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—A female, aged 51, was referred to the ear department on account of tinnitus aurium. It was found to be of a low-pitched pulsating character, and was diminished by compression of the vertebral arteries in the suboccipital triangles, pressure being effected by the thumb and middle finger of the observer's left hand, while with the right, counter pressure was exercised on the forehead. The menopause had taken place four years previously, and the patient had suffered from flushes of heat; her blood pressure was 150. She was relieved by the administration of bromide of potassium and magnesium sulphate. The tinnitus was assumed to be due to a neuro-vascular arterial congestion of the labyrinth.

Mr SYDNEY SCOTT (President) said that he always doubted whether the lumen of the vertebral artery could really be occluded by compression in the suboccipital region.

Mr J. S. FRASER said that most cases of tinnitus were due to neuritis of the cochlear nerve or to an affection of the cochlear ganglion cells.

Dr P. WATSON-WILLIAMS said that it was easy to exaggerate the value of this test; it was also easy to fail to appreciate its usefulness. He doubted, however, whether the vertebral arteries were really compressed,

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but in some cases of central tinnitus the method of Sir James seemed to stop the tinnitus. When desiring to know whether a tinnitus was of middle-ear origin, one compressed the corresponding common carotid, and often the tinnitus was stopped for the time being if it was a middle-ear affection; it was unaffected or even increased if it was not a middle-ear tinnitus.

Sir JAMES DUNDAS-GRANT (in reply) said that, in 1887, in order to make sure that pressure really acted on the vertebral artery, he had practised it on the cadaver. He exposed the artery in the lower part of the neck, fixed a syringe in it and injected water. The outflow of water through the cut end of the basilar artery completely stopped when pressure in the way now described was exerted. It was not likely, however, that, in the living patient, the lumen was so completely obliterated as to cause any danger. When pressure checked the tinnitus, it showed that the condition causing it was congestive, as in many climacteric cases. Bromides in some form were likely to be useful. The pressure might be useful in the diagnosis of aneurysm of a vertebral artery.

In reply to Mr Somerville Hastings, he suggested that the congestion was in the region most directly supplied by the internal auditory artery, a branch of the basilar, which was formed by the junction of the two vertebrals. In cases of congestive middle-ear disease one expected to diminish the tinnitus by compressing the carotid artery. In cases of tinnitus, he tested the vertebrals first, then the carotids; the former had no large companion veins associated with them, so that the result was more clear-cut than in the case of the carotids.

The patient was not brought forward for the discussion of tinnitus, but for the demonstration of this piece of "applied anatomy."

Case of Lupus of the Lobule—ARTHUR H. CHEATLE, F.R.C.S. —Female, aged 34, had hanging from the lobule of the right ear a pear-shaped tumour which had been growing for two years; it was dusky in colour and felt soft; there was no ulceration and the skin was smooth. Behind the auricle and just above the attachment of the tumour was a small apple-jelly spot. No sign of lupus or tubercle elsewhere; no history of injury. The tumour and nodule were removed in one piece and the skin sutured. Dr Creed reported that the section showed nodules of granulation tissue with a few giant cells. Politzer refers to a similar case reported by Neisser.

Mr J. S. FRASER said that in a similar case of his own the patient had worn earrings, but the present patient had never done so; she attributed the trouble to a warty growth, which she scratched and infected.

Case of Meningitis which recovered without Translabyrinthine Drainage—T. B. LAYTON, D.S.O., M.S.—Male, aged 19, was admitted on 7th December 1921. On 3rd December he had been seen by Dr Wallis Kemp, of Kingston, apparently suffering from a very acute attack of influenza. There was nothing to draw Dr Kemp's attention to the ears until the 6th, when he

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noticed that there was some strabismus; he then discovered discharge from the ears. He advised immediate removal to the hospital, but owing to inability on the part of the father to obtain transport this was not effected until 11 A.M., 7th December. The boy stated that he had only suffered from his ears since 5th December, but a history was obtained from the parents of chronic ear disease with discharge for years.

On admission: there was severe pain over the mastoid region with well-marked œdema, and there was frequent vomiting with severe headache. When seen in the surgery he looked so desperately ill that I doubted whether he would survive an operation. No detailed functional examination could be made.

At operation diseased bone was taken away in a wide area over the posterior cranial fossa, exposing a stinking, yellowish, evidently sloughing dura, overlying the lateral sinus and extending posteriorly to some distance over the posterior cerebral hemisphere and downwards over part of the cerebellar hemisphere. The sinus was empty under the slough, but the removal of part of the slough caused the sinus to bleed.

"Lumbar puncture was performed.

"The fluid was under increased pressure and turbid. Microscopically, pus cells were numerous; albumin increased. Culture revealed no organisms after seventy-two hours."

The next evening the patient shivered and the jugular vein was tied in the neck by a transverse incision. Lumbar puncture was done for eleven days in succession after the operation.

The patient left hospital on 13th January with the ear still discharging.

Cultivations were made from the cerebro-spinal fluid on 8th December and on five subsequent occasions and remained sterile, except on one occasion when a growth of a Gram-negative bacillus and a Gram-positive coccus was believed to be a contamination.

No quantitative microscopical and chemical examination was made of the original specimen; subsequent reports are as follows:—

Date.	Cells.	Protein per cent.	Sugar.
12th December 1921	Many pus cells in blood . .	0·05	Absent
13th " "	2000 per cub. mm. mainly polymorphonuclear leucocytes . .	0·05	In excess
14th " "	46 per cub. mm.	0·05	In excess
16th " "	15 per cub. mm.	0·03	Normal
18th " "	Much blood, white cells slightly in excess of red-white ratio .	0·045	Normal
19th " "	Much blood present, white cells in slight excess	0·04	Normal

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Dr P. WATSON-WILLIAMS asked whether there was any labyrinthine involvement in this case as the report afforded no evidence on this point. He had brought before the Section a case of meningitis in which there was definite labyrinthitis. He opened the external semicircular canal, and, in addition to repeated lumbar punctures, he carried out intrathecal and intravenous collosol argentum injections with success. In the present case he thought the meningitis was relatively circumscribed, and therefore he did not know why trans-labyrinthine drainage was considered at all, as there was a free opening for drainage by exposure of the portion of meninges which seemed to be involved, also the opportunity of repeated lumbar puncture.

Mr G. J. JENKINS said he thought Mr Layton should be asked to show the case after a complete examination had been made, as it was important to know whether the patient had had labyrinth trouble. He (the speaker) did not think lumbar puncture was helpful in treatment, except for the fact that it relieved intracranial tension. He had now a case in which the patient was recovering three weeks after the operation. The cerebro-spinal fluid showed a cell count of 1500, polymorphs were 95 per cent., a full amount of sugar, the protein slightly increased, and the chlorides normal. The patient had only one diagnostic lumbar puncture. He regarded his case as a *meningite de voisinage* and therefore did not drain the subarachnoid space.

Mr SYDNEY SCOTT (President) said he did not think the title of the case was a happy one, but presumed Mr Layton chose it to raise a discussion on trans-labyrinthine drainage. He (the President) would not advocate a trans-labyrinthine drainage except for meningitic infection secondary to that of the labyrinth, and Mr Layton did not say whether the labyrinth in his case was infected. Mr Tweedie had pointed out in the next room, one sign which suggested something was wrong with at least one portion of the boy's right labyrinth. He hoped Mr Layton would be willing to give a further report of a complete examination at a later date. It was not uncommon for patients to have acute mastoid infections with pus under great tension, followed by an effusion into the cerebro-spinal system, without its passing through the labyrinth. He agreed with Mr Layton's treatment, and considered that lumbar puncture had effected the drainage of the meninges. Probably all members had been faced with the problem as to whether the labyrinth ought to be fully investigated clinically; and what Mr Layton did was what many members would have done, viz., to open the mastoid and drain it, then do lumbar puncture. It was easy, within the next twenty-four hours, to apply, say the caloric test, if this had not been done before, and by the result one would be guided whether to proceed at once to drain the labyrinth, and open the internal auditory meatus.

Radical Mastoid Operation without Grafting or Meatal Plastic (Bárány)—DAN M'KENZIE, M.D.—In this method the radical mastoid operation is performed on the bone in the usual manner, but the membranous meatus is not interfered with. The operation is rather more difficult by reason of the meatal and tympanic landmarks not being exposed. The patient, however, shows that complete healing is possible without contraction of the meatus.

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Sir JAMES DUNDAS-GRANT said he hoped to show a case on which one of the earliest mastoid operations in London was done, and the result was excellent, though no plastic operation was performed. Also another patient, who had had a temporo-sphenoidal abscess, in which he made no attempt to do a "plastic," and now there seemed to be a result almost more perfect than surgery would have achieved. He thought there was perhaps too much keenness about doing a "plastic," and that if there was not too great an area of bone removed, plugging the membranous meatus sufficed, Nature being relied on to draw the soft parts closer to the bony walls, and so dilate the membranous tube.

Mr COLLEDGE said he regarded this proposal as retrograde, as in such cases débris collected behind the meatus and discharge continued. Six weeks ago a woman was admitted into St George's Hospital as an emergency case, which, fifteen years ago, had been operated upon for sinus thrombosis. No flap had been cut. She now came with a cerebral abscess, from which she recovered. But if a proper plastic had been done at the time, she would almost certainly not have had this complication fifteen years later. He (Mr Colledge) had another patient in hospital who had been operated upon in the summer by a general surgeon. A good bone operation had been done, but no plastic. She had been sent to him (the speaker) because she had facial palsy, and it was suggested that a nerve anastomosis should be done. She still had a foul discharge. He reopened the wound, and found a good radical cavity; she simply needed a proper plastic operation to render the ear dry.

Mr TILLEY said that he agreed with Mr Colledge. When a case came for treatment, one should base the treatment on the best one could do for 95 per cent. of the cases, not upon what might happen in 5 per cent.

Dr P. WATSON-WILLIAMS asked what was the reason for the modified mastoid operation being selected in this case. When the hearing of the ear to be operated on was useful, and particularly when the other ear also was diseased and deaf, and therefore when the patient had to depend on the ear for which operation was necessary, it was an advantage to run the risk of doing an operation involving a slow recovery, because by not interfering with the tympanic wall, one might retain a degree of hearing which was useful, but which a more complete operation would cause to be lost. Often a graft did not cover the inner tympanic wall which had been left uncuretted, but at all events, there seemed to be no reason why one should not graft on to the operated area and leave the inner tympanic wall uncovered. He (the speaker) had often preserved very useful hearing in this way, although the operation was a departure from the ideal and required more time in recovery.

Mr SYDNEY SCOTT (President) said he did not suppose Dr M'Kenzie suggested that this modification should take the place of the ordinary procedure as a routine practice. Much depended on the anatomical varieties of the particular mastoid being dealt with.

Mr G. J. JENKINS said his observations were not yet complete. He was not doing the operation described by Bárány; he made a big periosteal flap, removed all the diseased material in the region of the antrum, and took away the incus from behind. He then put the flap deep into the region of the antrum and aditus; the lower part of the cavity filled with blood clot.

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In suitable cases the result was perfect. The difficulty was in deciding which class of case was suitable for the procedure.

Mr J. S. FRASER said that Dr William Haskin, of New York, had been doing a similar operation to that described by Dr Dan M'Kenzie. The bony operation for the radical mastoid operation was completed, but no meatal flap was cut. The cavity was packed from behind for a few days. Later, it was allowed to fill up with blood clot and granulations, and the wound closed. The meatus was packed, and the result was what Mr Cheatle had just mentioned; there was not a big cavity liable to become filled with wax and epithelium and some pus. He (Mr Fraser) had, however, had no personal experience of this new type of radical operation.

Dr DAN M'KENZIE (in reply) said that his reason for exhibiting this case was to show that it did not matter very much what one did to the meatus in the radical mastoid operation. If one was fortunate in getting sepsis removed, there was a good result. He (the speaker) had tried many methods. No matter what method suggested itself, however, one found that somebody had tried it before.

Simulation of Malignant Disease of the Middle Ear by Cholesteatoma with Fibromatous Changes—DAN M'KENZIE, M.D.—Female aged 60, with old-standing discharge from the right ear and complete facial paralysis of recent appearance. The external meatus was infiltrated and occupied by vascular granulations which prevented a view of the tympanic region. In addition, there was present, arching over the attachment of the pinna in the temporal region, a hard semicircular mass just under the skin and extending down in front of the ear as far as the tragus.

The appearance left no doubt as to the nature of the disease, and the parts were opened up by a large incision so devised as to include the auricle in a large flap hinged forward like a door.

The hard mass was removed entirely. It extended from a cholesteatomatous cavity in the mastoid process round the temporal region as far as the pre-auricular gland. In the mastoid process itself old cholesteatoma and granulations were found, but no signs of any neoplasm. The meatal walls were ulcerated and ragged. The facial nerve was not encountered.

Portions from all parts of the field of operation were examined by Dr A. Renshaw and Dr Powell White, of Manchester, and their report is that nowhere was there any indication of malignancy discoverable. The fibrous mass contained fibromatous material and gland tissue.

Sir JAMES DUNDAS-GRANT asked whether this was not a case of genuine cholesteatoma, as distinguished from the post-suppurative cholesteatoma so often met with.

Two Cases of Chronic Suppurative Otitis Media, treated by Ionisation.—A. R. FRIEL, M.D.—(1) Aural discharge for many years, which persisted in spite of treatment by drops.

When patient was first seen, there were granulations on the posterior

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wall of the right ear, at the junction of the tympanum and the meatus. On aspiration with Siegle's speculum fœtid pus appeared.

The essential points in the treatment of this case have been as follows: Destruction of the granulations by zinc electrolysis and nitrate of silver followed by zinc ionisation of the cavity from which the pus was aspirated.

In order to distribute the electric current to the interior of the cell, in sufficient amount, the following device was used. A few inches of fine silk-covered copper wire were taken, doubled, and twisted. The twisted portion, slightly over an inch long, was fastened to a light handle. It was then, together with the lower part of the handle, dipped in a warm solution of a zinc salt thickened with gelatin and then hung vertically, so that a small blob of gelatin collected at the tip. When dry, the twisted wire, except the very tip, was painted with shellac varnish. When the patient was ionised, one of the free ends of the wire was attached to the positive terminal of the rheostat, while the end of the twisted portion was insinuated into the narrow opening of the cell after it had been filled with a few drops of zinc sulphate solution. The silk and gelatin prevented a short circuit on to the tissues, and the shellac varnish prevented the current from being dissipated in the meatus and tympanum.

The discharge has ceased.

(2) Aural discharge from the left ear for over four years.

On examination the condition was found to be attico-mastoid disease with fœtid discharge, cholesteatoma, and polypus; also polypus and granulations in the tympanum.

Treatment has been as follows: Portion of the outer wall of the attic was destroyed by electrolysis, the remains of malleus and incus removed, and the tympanic antrum treated with zinc ionisation. The disease within the tympanum has been treated with zinc electrolysis and nitrate of silver, zinc ionisation and boracic powder.

The ear has remained dry for several months.

Dr W. HILL said that many people were sceptical as to the value of this method of Leduc's. In the selected cases which he, the speaker, had sent to Dr Friel, there had only been one failure; in two there had been granulations. He did electrolysis first, ionisation afterwards. Success depended on a very careful technique. At first he was himself sceptical about it, but that was not the case now. In cases with granulations, the discharge had all stopped, a very important matter, especially in children. He had sent to Dr Friel cases of recurrent furunculosis of the meatus, and he had stopped the further formation of these inflammations.

Dr T. B. JOBSON said he thought the destruction of the outer attic wall by electrolysis was a new and original idea, and it might lead to a great advance in the treatment of attic cases. If this treatment were generally carried out for such cases he thought it might cure a good many without sacrificing the hearing.

Mr SOMERVILLE HASTINGS asked how often Dr Friel had destroyed the outer attic wall by electrolysis. It seemed a dangerous process to remove

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bone by causing its necrosis; the speaker considered the area too near the meninges to be safe for removal by necrosis. He would like to know how many times the exhibitor had removed a sequestrum by electrolysis.

Dr FRIEL replied that he had carried out this procedure seven or eight times, mostly on children, in ordinary out-patient work. He had adopted local anæsthesia, injecting novocaine into the posterior wall, at the junction of the cartilaginous and bony parts. He used one or two dry cells to furnish current to the apparatus.

Case of Cerebral Abscess as a Sequel to Acute Otitis Media, which had completely healed. Operation. Recovery—H. RICHARDS, M.B., B.S. (introduced by Mr W. H. MOLLISON).—Boy, aged 16, with acute otitis media (left). May, 1923: paracentesis; recovery with normal hearing, followed by headaches over left side.

Eight weeks after the otitis, admitted to hospital on account of severe headaches, vomiting, irritability, optic neuritis, diplopia, and sensory aphasia. The boy showed some weakness of the left external rectus and bilateral papilloedema, and some spontaneous nystagmus to either side. His hearing was normal, and both labyrinths reacted normally.

From the presence of sensory aphasia the diagnosis of abscess was made and an operation was performed. No sign of disease found in mastoid process or antrum; swabs showed the antrum to be sterile. Dura mater of middle fossa under some increased tension; exploration of temporo-sphenoidal lobe revealed an encapsulated abscess separated from the surface by $\frac{1}{2}$ in. of apparently normal brain; the abscess contained 1 oz. or more of odourless pus, from which a pure culture of streptococci was grown. Drainage by means of a tracheotomy tube for twenty-four hours only. Uninterrupted recovery.

Mr SYDNEY SCOTT (President) said that the case re-introduced the subject of the drainage of brain abscess as well as other interesting points, such as the development of the signs of brain abscess after the original infection had resolved. He (Mr Scott) had seen such cases, in one of which an enormous brain abscess formed, filling the whole temporo-sphenoidal lobe, and extending back into the occipital lobe, the symptoms of which arose after the acute suppurative otitis media had completely disappeared without operation.

Facial Paralysis associated with Actinomycosis, and simulating a Bezold Mastoid Abscess—J. F. O'MALLEY, F.R.C.S.—Male, aged 67. At the beginning of August 1923 had a mosquito bite near right ear, followed by large swelling and inability to move his face. 15th August 1923 (seen by Dr Verbrugge): Temperature 101.5° F., which persisted for five days. Swelling prominent below ear and extending on to mastoid and parotid region. 21st August 1923: Swelling incised, pus escaped and has continued to do so since. 1st November 1923: On account of mastoid infection seen by exhibitor, who suggested actinomycosis. Slides shown with mycelium.

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