immobile right cord. As the paralysis affected the right vocal cord, it was thought advisable to obtain the opinion of a physician. Professor Gulland reported that he could find absolutely nothing wrong in the patient's chest and that examination of the vascular and nervous system revealed no abnormality. The urine was healthy and examination of the blood showed normal conditions both as regards the white and red cells. Professor Gulland ordered complete voice rest and increasing doses of strychnine. The patient was not seen again until 6th July 1929, *i.e.*, more than two months later. It was found that the hoarseness had disappeared and indirect laryngoscopy showed that both vocal cords moved well.

These cases were probably caused by peripheral neuritis, due, in the first two instances, to syphilitic virus and, in the last, probably to cold. We know that cold, as in the case of a patient sleeping in a railway train with the window open, may lead to facial paralysis (the so-called "rheumatic" paralysis) and it seems by no means impossible that paralysis of the recurrent laryngeal nerve may be due to the same cause.

SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY.

May 2, 1930.

President, W. M. MOLLISON, M.Ch.

On the Surgical Treatment of Otosclerosis—MAURICE SOURDILLE.—The paper is published in the *Journal of Laryngology and Otology*, Vol. xlv., p. 601, September 1930.

DISCUSSION.

Mr G. J. JENKINS said that he had operated upon some cases of "otosclerosis" and had published the results in a paper read at the International Congress of 1913. The operation had been described in that paper. Briefly, it consisted in making a small window into the external semicircular canal.

He was prompted to perform the operation because it seemed to him, on clinical grounds, that the symptoms and signs of otosclerosis were

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probably due to changes in the labyrinthine fluid and not to the fixation of the stapes. The object, therefore, was not to make a new window, but to alter the physical condition of the labyrinthine fluid by allowing what was in the labyrinth to escape, and to promote the formation of a fresh fluid which might be nearer the normal.

Certain observations were made that might be of scientific value. At the operation it was noted that in all cases there was no flow of fluid from the labyrinth when the opening was made into the canal.

In all there was a marked improvement in hearing immediately after operation. In one case the hearing was improved from two feet to fifteen feet. Within six months the hearing had returned to the condition before operation. In all cases the tinnitus disappeared immediately after the operation and did not return.

Recently he had carried out a similar operation on a patient who had advanced otosclerosis complicated with osteitis deformans. The right ear was functionless and no response could be obtained from auditory or vestibular elements.

The patient could hear loud shouting in the left ear and could distinguish occasional words. He had been under observation for about twelve years and had tried many remedies for the continuous "steam escaping" and whistling noises in the left ear. He became desperate—perhaps suicidal—and it was decided to try draining the labyrinth through the external semicircular canal, as this had given relief in ordinary cases of otosclerosis.

The operation had been more difficult than usual, on account of the changes in the bone of the canal and the severe bleeding. No fluid escaped from the opening and there seemed to be a negative pressure on the canal. The noises disappeared and the day after the operation the patient was completely relieved and happy. The operation had been performed six weeks previously and the patient was quite satisfied with the result, though he was stone deaf and had difficulty in getting about at night.

He (Mr Jenkins) wished to emphasise that he did not advocate operative treatment for otosclerosis and had only narrated this case in order to record certain facts of scientific interest.

Dr DAN MCKENZIE said that Dr Sourdille had supplied a novelty in two operations, the object being to avoid sepsis. When one came to operate on dry ears, the difficulty was that the surgeon found it very hard to control sepsis; it was practically impossible to sterilise the depth of the meatus. If by sterilisation one could prevent sepsis here, one could experiment in these cases much more freely. If suppuration occurred after operation on a patient whose ears had been dry, it meant that instead of being simply deaf owing to dry changes in the middle ear, the patient was still deaf but was now subject to chronic suppuration—a transformation which no one could contemplate with equanimity. Dr Sourdille's plan therefore might eventuate in giving more freedom for experiment.

As to the essential part of the operation: from the point of view of deafness, that of making an artificial window in the labyrinth outer wall it was an obvious procedure to anyone who thought out the pathology of the condition and yet it was also easy to criticise *a priori* what would happen when a small window was made. After the hearing had improved,

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the window would be closed by a cicatrix, which would become less and less mobile, and when finally it was fixed one could scarcely expect the patient to hear better. Still we ought to experiment to see whether these *a priori* fears were borne out by the result. They might be wrong, or it might be possible to devise a cicatrix like Dr Sourdille's, which would, perhaps, remain flexible.

Mr HAROLD KISCH said that he had performed some operations in cases of deafness and catarrh of the middle ear. He had not thought that any operative procedure would give permanently beneficial results in otosclerosis, but possibly, in other types, making a new opening into the internal ear might result in improved hearing. He had considered the question as to whether he should make his new opening through the semicircular canal or through the promontory, and had decided on the latter. He employed a simple method, namely, exposing the middle ear and then using a small trephine which was worked from a dental engine. The trephine fitted well over the cap of the promontory, the outer wall of which was removed. The opening was closed immediately by means of a skin graft, taken from the thigh. He had shown some cases illustrating the results of this operation at a meeting of the Section years ago, and just before the War he had collected his results in eleven cases. During the War, however, his papers were lost and the patients were scattered. But recently he had heard of two cases of that series, and the results of those were interesting. One patient whom he had shown was a kitchenmaid, and she could not obtain any other employment because she was unable to hear the bell or the voice properly. Two years afterwards she became a housemaid as she could hear much better, and recently she obtained a post as shop assistant, indicating a marked improvement in hearing. In the other of the two cases the girl went to Australia. She was a teacher, but had been obliged to give up teaching because she was so deaf. Recently, however, she had been able to resume that occupation. The records of the other cases had been lost.

Sir JAMES DUNDAS-GRANT said that an interesting point had emerged, namely, that after the primary operation, if a not too active plastic procedure was carried out and the membranous wall of the meatus was allowed to "tapestry" the posterior wall of the cavity, it would adapt itself. Instead of becoming thicker it became extraordinarily thin, and there was a closer adaptation to the bone through a process of centrifugal contraction. This was exemplified in a case which he had exhibited—that of a girl upon whom he had operated many years previously for cerebral abscess, without carrying out any plastic procedure. When the case was shown,* the cavity of the mastoid operation was seen to be lined with an ideal thin lining finer than a Thiersch graft. That was a great point which Dr Sourdille had brought out. When this thinning took place, several months later, was the favourable moment for the procedure. It was a distinct advance on what had been shown before.

Mr ALDINGTON GIBB said he had had a male patient (a lecturer) suffering from advanced otosclerosis, who could not hear any sound with his ear. He (the speaker) was invited to perform on him any operation

* *Proc. Roy. Soc. Med.*, Sect. Otol., 1924, xvii., 73.

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he liked. His reply was that he could not undertake an operation as he was unable to promise success, but that if he could be permitted to bore a hole in the drum he would do so. He bored a hole in the postero-inferior quadrant, and the man was able to hear conversation and to hear his knife and fork at work during a meal. That had been an advanced case of otosclerosis. This operation had been repeated with similar success.

The Indications for performing Wilde's Incision—T. B. LAYTON, D.S.O., M.S.—The paper is published in the *Journal of Laryngology and Otology*, Vol. xlv., p. 615, September 1930.

ILLUSTRATIVE CASES.

Five Cases in which Wilde's Incision was successfully performed for Retro-aural Swelling.—T. B. LAYTON, D.S.O., M.S.

CASE I.—J. D., male, aged 3 years. Moderate case of scarlet fever, with bilateral cervical adenitis, profuse rhinorrhœa and bilateral otorrhœa. One month after the onset of otorrhœa, œdema over right mastoid, with fever (101°): Wilde's incision; recovery; on discharge, drumhead and wound both healed.

CASE II.—H. R. G., female, aged 7 years. Severe attack of measles in October. Double otorrhœa early in November. Swelling behind left ear 6th December; Wilde's incision, no pus. Redness over right mastoid. 20th January; Wilde's incision. February, both wounds healed and drumheads healed. Note: This child was extremely ill with broncho-pneumonia, and almost certainly would not have survived any operation at the time the first Wilde's incision was performed.

CASE III.—(*Shown by Mr Layton and Dr Laurent.*)

B. B., female, aged 9 months. Scarlet fever in November 1929. December, right-sided cervical adenitis, incised. 15th January 1930, spontaneous left otorrhœa. 15th February, rise of temperature, red tender swelling over left mastoid. Wilde's incision; discharged from hospital with healed wound and dry ear.

CASE IV.—(*Shown by Mr Layton and Dr Laurent.*)

W. C. B., male, aged 5 years, admitted 1st January 1930, on account of diphtheria; developed scarlet fever, while in hospital, on 4th February. 1st March, spontaneous double otorrhœa. 8th March, slight œdema over right mastoid. No pyrexia. 9th March, rise of temperature and œdematous swelling over right mastoid. Wilde's incision. Discharged 1st April, incision and both drumheads healed.

CASE V.—(*Shown by Mr Layton and Dr Blake.*)

J. M., female, aged 6 years, admitted on account of scarlet fever to Western Hospital in November and transferred to Northern Hospital,

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12th December 1929. Intermittent pyrexia, 10th to 15th January with right ear discharge, which developed and persisted, gradually lessening in amount until 15th February when drumhead was intact, with a small scar on the lower posterior quadrant. 16th February, complained of pain in right ear, accompanied by slight discharge, and at 10 a.m. on the same day swelling, redness and œdema over right mastoid. Wilde's incision done immediately, no pus found. Thick pus noted on 21st February; the discharge lasted till 17th March and the otorrhœa until 18th March.

A Case showing the danger of not performing a Mastoid Operation if Ear Discharge persists after a Wilde's Incision.—T. B. LAYTON, D.S.O., M.S.

Female, aged 5 years, admitted to Grove Hospital with a mild attack of scarlet fever on 8th January. Retro-aural swelling and right otorrhœa on admission. Wilde's incision, pus evacuated. Temperature remained normal throughout. Child put on weight and looked very well. Wound healed, but otorrhœa persisted. Mastoid operation, 15th February: Extradural abscess, with extensive granulations over the dura mater. Cultivations from cortical and subcortical bone, and from the pus all remained sterile.

The PRESIDENT said that Mr Layton appeared to have made out a good case for performing Wilde's incision on children in fever hospitals.

Dr DAN MCKENZIE said that Mr Layton always did much good by compelling a reconsideration of first principles. What did Mr Layton think that Wilde's incision did? Was it not just what the old doctors called counter-irritation? Would not a fly-blister bring about the same result? Wilde's incision could give some relief if there was a subperiosteal abscess, but if it was feared there was pus in the cells and the patient could not stand a long operation, why not make a breach into the mastoid cortex? One then secured more drainage. If one made an incision through the soft parts and stopped there, one did not relieve the interior of the bone, except gradually, but if one took the gouge and eased the outer cortex of the mastoid and opened a cell, that was sufficient to relieve the pressure inside, at all events until the patient could stand the complete Schwartze operation.

Mr E. A. PETERS said that twenty years ago, when he was at Paddington Green Children's Hospital, he had carried out Wilde's incision on six children. There was an epidemic of mastoiditis and the series of six could not be admitted. There was much retro-auricular swelling, with a raised temperature.

What had Mr Layton found on making the incision? In two of his (the speaker's) own cases there had merely been serum, and in four there had been pus. Two of these latter had settled down, and it was only necessary to open the antrum eventually in two of the series. He thought the success of the incision was due—as had been pointed out by

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the late Mr Arthur Cheatle—to the fact that in children the outer wall of the antrum was composed of thin spongy bone.

The drainage and relief of tension afforded by incising the periosteum resulted in resolution of the mastoiditis in four out of the six cases. The pus came through the bone in the antral region of the squamo-petrosal suture.

Mr LOWNDES YATES said that soldiers during the War used to suffer from a swelling behind the ear, and an incision was made, and they were passed down to the Base. Many results were seen afterwards, and they were what one would expect if Mr Layton's advice were followed out and if they were not operated upon later. The cortex of the bone became greatly thickened; the outer table was too strong for the pus to penetrate, and so it went through the inner table and formed an extradural abscess. Some of the cases gave a history of having refused a second operation, because they had already had an operation on the ear, and their ear was not hurting them. He had noticed that when the outer table became thickened as a result of the healing process, the pain was largely lost. Mastoid pain more probably occurred when the unsclerosed outer table was inflamed during the course of mastoiditis. His recollection was that in these cases pain was relieved by the incision, and that often it did not recur, although the inflammation in the mastoid was still active.

Mr L. GRAHAM BROWN said he had never carried out Wilde's incision. He agreed that its indications were limited to those cases in which the patient could not stand a general anæsthetic. In other cases no time was lost in, at least, opening the bone. To his mind, the greatest difficulty was the healing after infectious diseases, especially after measles in these cases. Further, in acute mastoiditis in infants he had known a secondary infection to supervene, so that the stitches had come out of the wound and thus caused the ear to hang down. That misfortune could be obviated by using a limited incision. Instead of making the incision from the top of the pinna to the tip of the mastoid, he made it only over the mastoid process and down to the periosteum, laying the bone bare with a rugine, and opening up with a chisel. He then inserted the tube in the usual way for drainage. Thus one avoided much infection of the soft tissues, and especially of those over the temporal muscle.

Mr C. DE W. GIBB said he was surprised that Mr Layton had not mentioned the possibility of recurrence, even after healing, when Wilde's incision had been performed and the discharge had ceased. He (the speaker) had had such cases. When he had taken up his present appointment, he had an instance of a Wilde's incision performed by a general surgeon in a six-months-old infant. The discharge had persisted, and so he had removed some adenoid growths. Under treatment the discharge had ceased and the infant was taken away with the drum normal; the incision had healed. Six weeks ago, however, the child was brought back to hospital having a typical mastoid infection. He (the speaker) had then performed a Schwartze operation, and the condition had cleared up. This case illustrated one of the disadvantages of Wilde's incision.

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Mr J. C. BLAKE said that in the last case shown by Mr Layton, Wilde's incision had been performed immediately the swelling had been noticed, *i.e.* within two hours. When the child was discharged there was a completely healed drumhead, and the mastoid wound also had healed. So that in that instance the Wilde's incision had been a success, though one did not know that mastoid trouble might not follow later on. The temperature had come down after the Wilde's incision, and the child had made a normal recovery.

Mr R. J. CANN said that during the four years that he was Mr Layton's assistant at Guy's Hospital, Mr Layton had stimulated him to perform Wilde's incision in a general hospital, but he did not remember a case in which that procedure had been a success, *i.e.*, one in which he did not have to do a further operation.

During the last year, at the Evelina Hospital, he had twice performed Wilde's incision on infants under a year old, in whom the general condition was not equal to an operation, indeed they could not have stood the anæsthetic. In the first cases in a marasmic baby, the incision was made without an anæsthetic; in the other case there had been pneumonia, and in that case he had expected to be obliged to perform a subsequent operation. But in three weeks' time healing had taken place in both these cases: there was no discharge, and the drums were intact.

Mr LAYTON (in reply) said he was pleasantly surprised to find these views less unfavourably received than he had expected. He was, however, grieved to see that the member whose criticism at a former meeting had caused him to prepare this paper had left the room before he read it, as had that other member whose antagonism had been most vociferous in the private discussions on the cases in the Barnes Hall.

As a rule he did not advocate Wilde's incision for adults. Mr Cann had mentioned cases which had not been successful. In infectious diseases such cases must be watched carefully, and in adults the chance of the Wilde incision being successful was so small that it was better to do the other operation straightway unless there was some reason against it. One feared complications in the adult when waiting, while there need be no such fear in children. The two cases he had recounted were absolutely isolated. With the first patient he had argued for two hours to try to persuade him to consent to the operation, as he had feared for the patient's life if he did not perform one.

Leaving out the question of adults, what did Wilde's incision do? Either there was disease of bone or there was not. If there was such disease, then Wilde's incision would not cure it. But it did relieve the tension, it mitigated the bad symptoms, and it was a good course of action until the patient was better. It was a principle in the surgery of acute disease to deal with the acute condition, and to clear up the underlying disease at a later stage. To perform the Wilde's incision was to carry out that principle.

In a case in which a Wilde's incision effected the patient's recovery he did not think there had ever been any inflammation of the bone, but that the products of inflammation had passed from the middle ear along the external auditory meatus to the point where the bony and cartilaginous

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meatus met and there turned backwards to the mastoid region. It was known that the middle ear could be infiltrated with an anæsthetic solution from the subperiosteal space of the meatus, therefore it was clear that the fluid exuded in an inflammation could pass the other way. That was how the serum or pus reached the meatus and why a swelling of the deep meatus was not necessarily evidence of inflammation of the mastoid, as was so often taught.

Now at every immobile joint the periosteum split and became continuous through the joint with that on the other side, therefore the potential space beneath this periosteum became continuous with that on the other side of the joint and not with the further space on the same side. Thus the potential space beneath the cutaneo-periosteum of the deep meatus was not continuous with the space beneath the cutaneo-perichondrium of the superficial meatus but with that beneath the periosteum over the side of the skull by the mastoid bone, and that was how the products of inflammation which had reached the deep meatus from the middle ear were guided to the same area as that in which the swelling appeared, with an inflammation of the mastoid bone. Twelve months ago he had had a case in which the incision had been carried out through the meatus. A large swelling of the deep meatus was present and he had thought it was a case in which a retro-aural swelling would arise. His house-surgeon (Mr T. G. Scott) had incised the swelling and the child had recovered.

Once one had grasped the idea that a case of otitis media complicated by a retro-aural swelling might recover after a Wilde's incision, most of the questions he had been asked were answered, and most of the criticisms fell to the ground.

Thus, Dr Dan McKenzie asked what the incision would do. The answer was that it would either effect a cure or put the patient in a condition of safety and prevent an extension in other directions. It had been suggested that a fomentation without incision would do as well. Undoubtedly in certain cases, but not where pus had formed, nor would it relieve the tension in cases in which the bone was involved, and one could not say which these were until the incision had been made.

Again, Dr Dan McKenzie had asked why one did not take the gouge and ease the cortex. He (the speaker) used to do this, but had given up the practice. If the case was one that could be cured by an incision, this easing of the cortex was unnecessary, as there was no disease of bone. If there was disease of bone, the incision of the periosteum would relieve the tension and make the patient safe for the time being, and if it did not, then the complete mastoid operation should be done, and it was doubtful whether easing the cortex was sufficient. There was a further argument against it. The Wilde's incision could be made while the patient was in bed. With a small infant the crying was often no more than one heard when a nurse was washing a baby. For an older child he preferred a short anæsthetic, but there were many cases in diphtheria and measles and also in scarlet fever in which it was much better not to give the patient any anæsthetic at all.

There was another criticism that had been put to him. Surgeons had operated on cases of retro-aural swelling and found an extra-dural abscess

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with granulations on the sinus and had agreed that by performing the larger operation they had prevented a septicæmia. This was a wrong deduction : the relief of tension afforded by a Wilde's incision would have done the same. In such a case the major operation was better carried out at a later date than through an œdematous area of skin and superficial tissues.

So much for replies to destructive criticism. There were three points of constructive criticism on which he would like to comment. Mr Lowndes Yates' experience of performing a Wilde's incision in a Field Ambulance or Casualty Clearing Station, and sending the patient on to a General Hospital, was quite in accordance with his (the speaker's) indication for the general practitioner working at some distance from an operating otologist. In reply to Mr Gibb, he had not had recurrences after Wilde's incision. Of course it was possible for a patient who had had an incision done to have mastoid trouble later just as a recurrence under the old scar might happen after a mastoid operation. He had had a number of such cases, but thought they were fresh attacks and did not argue that at the original illness a larger operation should have been done. He suggested that in Mr Gibb's cases the ear discharge had continued and the mastoid had not been opened. This was a course of action with which he had never agreed. Lastly, with reference to Mr Graham Brown's comment on falling down of the pinna, it was characteristic of scarlet fever that the healing power of wounds was markedly diminished. Stitches were apt to cut through, so that the pinna fell down and made a valve of the meatus. To avoid this he had for several years refrained, whenever possible, from making the upper part of the usual curved mastoid incision, and had used only a straight incision over the lower area.

Inclusion Cyst of Pharynx—K. W. MacKenzie, M.B.—Miss R., aged 36, had her tonsils removed by dissection in 1927. A few months later she began to complain of discomfort in the right side of the throat. This lasted about a week and was accompanied by a little swelling in the right tonsillar fossa, which would increase in size, discharge a little pus and then subside. The discomfort would then disappear. This process recurred about half a dozen times before she was admitted to hospital. Between the attacks the position of the swelling was marked by a little thickening, while the swelling itself was about the size of a bean.

August 1929.—At operation, the swelling was easily stripped from the tonsillar bed and the pathologist reported it to be an "inclusion cyst" lying exposed on the raw surface of the pharynx; running slightly downwards and forwards was a nerve which appeared to be the glosso-pharyngeal. The fossa healed very quickly and the nerve was soon covered by granulation tissue.

Three or four weeks after the operation, the patient complained of a tingling sensation in the lobe of the right ear, particularly when exposed to cold air, and she had a feeling that the lobe was larger than normal. The tingling sensation disappeared after a few weeks,

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but the sensation of increased size was still present in February 1930.

Dr ALBERT A. GRAY said that this was an interesting exhibit because of the relationship between Arnold's nerve and the facial nerve.* Several years ago, at a meeting of this Section, he had read a paper dealing with this relationship, which varied in different individuals more than one would expect. Arnold's nerve was supposed to pass behind the facial and to send a twig into it, or to receive one from it. Sometimes the nerve did not pass through the bone at all, but went along the base of the skull. In other cases it sent a twig to the chorda tympani. The anatomy of that part of the temporal bone was not properly understood, because of the great variations which had just been mentioned. This little plexus in man was represented by a very large plexus in the sheep, and was outside the bone altogether. With the formation of the mastoid it had become included in the bone. The variation in the pain and subjective symptoms in cancer and other conditions in the throat were largely due to the variations in that small plexus between Arnold's nerve and the facial nerve.

Mr HERBERT TILLEY, in supplementing Dr Gray's observations, said that fibres from the small nerve (ramus facialis cutaneus) which supplied the back of the ear, and the deep meatal region passed by way of the superficial petrosal to the geniculate ganglion and thence to the spheno-palatine ganglion, and explained the otalgia which a patient might complain of in chronic sphenoidal sinus inflammation. In 1892, at the Ipswich meeting of the British Medical Association, he (the speaker) had brought forward a case of sphenoidal sinus suppuration in which the only symptom complained of was earache. There were no obvious symptoms of the sinus suppuration during the attacks, and the ear on the same side was intensely flushed in comparison with the other ear. There was an interesting reference to this subject by Larsell and Fenton, in their publication, *The Embryology and Neuro-histology of Spheno-palatine Ganglion Connections: a Contribution to the Study of Otalgia* (American Otological Society, Washington, D. C., May, 1928).

Dr K. W. MACKENZIE (in reply) said he had looked up Gray's *Anatomy*, and found that the nerve supply to the lobule of the ear was from the great auricular, and that this nerve was connected with the posterior auricular. This in turn communicated with Arnold's nerve, which received a filament from the petrous ganglion of the vagus, and thus completed a chain between the pharynx and the lobe of the ear.

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* *Proceedings*, 1921, xv. (Sect. Otol., 15).

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