A piece of growth was removed for microscopic examination, the pathologist's report being returned as "lympho-sarcoma."

In reviewing the case, the points to which more weight might have been given in establishing the diagnosis, to the exclusion of the question of foreign body, would appear to be—

(*a*) The left recurrent paralysis; and
(*b*) The downward displacement of the heart and liver.

I am indebted to Dr Neville Crowe for the opportunity of dealing with the case and for the assistance of his X-ray examination.

SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTIONS OF LARYNGOLOGY AND OTOLOGY.

COMBINED SUMMER MEETING.

June 26, 27, 28, 1924.

Chairmen—Mr H. J. BANKS-DAVIS (President of the Section of Laryngology), and Mr SYDNEY SCOTT (President of the Section of Otology).

Tortuosity of the Internal Carotid Artery in Relation to the Pharynx—A. BROWN KELLY, M.D.—(The paper will be published in the *Journal of Laryngology and Otology*, January 1925.) The pulsating swelling sometimes observed in the pharynx is due to tortuosity of the internal carotid artery and not to an enlarged ascending pharyngeal or aberrant vertebral artery. The tortuosity may be explained during development of the internal carotid artery by the persistence of a natural bend at the junction of the two parts from which it takes its origin. Normally, during growth, the artery becomes straightened out, but, if this is incomplete, undulation or tortuosity will persist.

DISCUSSION.

Mr MARK HOVELL said he had never seen a swelling of the size shown in the author's illustration, therefore he concluded he had not seen a tortuous internal carotid; but he had many times seen a small vessel coursing on one or both sides internal to the posterior pillar, which he had

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thought to be the ascending pharyngeal, passing in front of the constrictor, instead of behind it. Once he was sent for in order to see a patient who was said to have an aneurysm, but he found it was simply a case in which this artery was in front of the muscle, instead of behind it.

Mr E. D. D. DAVIS referred to two cases similar to the one now described by Dr Brown Kelly, in neither of which there had been any symptoms. The abnormal carotids were found accidentally. There had been two cases in which peritonsillar abscess had caused severe hæmorrhage. One boy nearly died of the hæmorrhage from such an abscess. He developed hemiplegia, and twelve months later the tonsils were removed with a sharp guillotine; and when 14 years of age, Mr Trotter removed the aneurysm of the internal carotid. The other case was reported by Mr A. J. Hutchison, of Brighton; a peritonsillar abscess was punctured, and the patient died of hæmorrhage. Sébileau published in a French journal a paper quoting eight cases of fatal hæmorrhage from the internal carotid, and in each case punch forceps had been used for removing the tonsil.

Mr W. IBBOTSON asked whether the walls of the vessels in this case were diseased. Dr Brown Kelly classified cases according to whether there was pulsation or prominence; he (the speaker) took it that if a vessel were prominent it would be pulsating.

Mr F. W. SYDENHAM said that fifteen years ago he operated on the posterior end of an inferior turbinate with curved cutting forceps, and half an hour afterwards the patient bled very profusely. He recovered, and it was thought that a small artery had been cut. A week later there was again profuse bleeding from the nose, so that it had to be packed. A week later still there was again severe bleeding, therefore he tied the facial and the ascending pharyngeal. But at the end of a week there was so much bleeding that the patient became blanched. He then tied the common carotid, and after that the patient did well. He thought the original operation must have damaged an abnormal internal carotid.

Dr BROWN KELLY (in reply) said he thought there would be more danger from working in the naso-pharynx than in the pharynx. In the second anatomical specimen the artery high up formed an angular projection, which would be visible only in the naso-pharynx, where the use of such an instrument as Loewenberg's forceps would be dangerous. With regard to the distinction between pulsation and prominence, a prominence was observed where there was persistent bulging, whereas in pulsation there was a temporary bulging during systole only. It was conceivable that all these cases were congenital, or that there was present a congenital factor, which in older people had probably lain latent.

Mr H. J. BANKS-DAVIS (Chairman) asked whether Dr Brown Kelly thought these pulsating vessels at the side of the pharynx were always the internal carotids and never the ascending pharyngeals.

Dr BROWN KELLY (in reply) said that that was his opinion.

Mr BANKS-DAVIS said that this statement, coming from Dr Brown Kelly, was very important.

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Societies' Proceedings

Throat and Ear Defects from the Standpoint of the Elementary School Child—ELEANOR LOWRY, M.B.—(The paper is published in the *Journal of Laryngology and Otology*, September 1924, p. 488.) The difficulties under which School Medical Officers had to work were considerable. In no less than eighty-nine districts under Education Authorities in England and Wales no provision was made for the treatment of adenoids and tonsils. A great need existed for early expert treatment for throat and ear defects especially in otitis media, which, if properly treated at first, would save so much unfitness and waste of life in later years.

DISCUSSION.

Dr J. S. FRASER asked why these children were not more thoroughly examined in the schools. Hearing tests could be carried out by the school teachers if the room were kept quiet, one ear being occluded while the other was examined, and the child turned sideways to obviate lip-reading. Deafness in children was frequently stated to amount to only 1 per cent. or 2 per cent., but he believed the percentage to be much higher, as about 5 per cent. of children had otorrhœa. Otorrhœa might not always cause severe deafness, but no child with a running ear had normal hearing in that ear. Those who had to make these examinations ought at least to be provided with proper instruments for examining the oral pharynx, nose, and ear. Much of the nasal obstruction which was attributed to adenoids was due to enlarged turbinals.

Sir JAMES DUNDAS-GRANT said that work such as Miss Lowry's would be of great benefit to the children who were the men and women of the future. He was afraid, however, that minute examinations might reveal too much, and that undue significance might be attached to minor defects. Still, school doctors were trained to discover essentials, and much good was done in these school clinics.

Dr DOUGLAS GUTHRIE said that, as he was connected with a school clinic, he appreciated the difficulties of the school medical officer. One of those difficulties was that of getting the family doctor to do anything in the matter: either to operate, or to send the case to some one who would do so. Nevertheless, months after, the adenoid child seemed to be better. Here was one piece of research which those connected with schools could do; they could follow up these cases and find out what became of them. Sometimes children were seen who obviously, from the specialist's point of view, required a mastoid operation, but nothing was done, and after adopting conservative treatment everything cleared up.

Miss LOWRY (in reply) said that many cases were brought forward by school teachers. Her strictures were not only directed to London, where the conditions were better than elsewhere, and were improving yearly, but there must be many children whose ear condition was overlooked by the teachers, and a child might hear well with one ear, but be stone deaf in the other. Following up cases was complicated if one had to send a case away for transillumination or for a mastoid operation. The best clinics

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were those attached to hospitals, or clinics in which the work was done by those holding hospital appointments, who could take in children themselves.

Displacement of Antro-Nasal Wall in the Treatment of Atrophic Rhinitis—W. S. SYME, M.D.—(The paper is published in the *Journal of Laryngology and Otology*, September 1924, p. 481.) The antrum was opened through the canine fossa and the whole antro-nasal wall displaced medially and brought into contact with the nasal septum. It was retained in position by firm packing on the antral side. Twenty-three patients were operated upon, and the results as regards the ozæna appeared to be very satisfactory.

DISCUSSION.

Mr W. IBBOTSON asked whether there was a deflected septum in the unilateral cases. If so, would not submucous resection have diminished the patency on the atrophic side, without the need of doing the more risky operation on the maxillary sinus?

Mr CYRIL HORSFORD said his procedure was to split the septum and push it over, and he found it did much good. After this had been done, one patient remained free from ozæna. In unilateral atrophic rhinitis in which there was a deviated septum, he suggested that the bones and cartilages should be divided and the septum replaced in the new position, thus making a cavity where the convexity had been, without resecting any bone.

Mr W. H. HOWARTH said that Dr Syme's procedure seemed to give extraordinarily good results. The high percentage in which he found suppuration in the antrum was very interesting, and possibly threw some light on the ætiology of the condition. Probably the commonest cause of atrophic rhinitis was suppuration in one or more of the accessory sinuses, often persisting from childhood, and Dr Syme's statistics supported this idea. If the ethmoid were explored in these cases, evidence of suppuration would probably be found there. He intended to give this operation an extended trial.

Sir JAMES DUNDAS-GRANT said that he was interested in the results of this somewhat radical treatment. Lautenschläger had been credited with its introduction. A modification which seemed to obviate the necessity of continuous plugging consisted in passing a strong wire from one antrum into the other through the nasal septum; the wire was then turned round and pushed back in such a way that the knot was in the nasal fossa.

It was necessary to classify ozænas; they differed probably according to the kind of suppuration giving rise to them. Many cases were secondary to sinus disease; some had no association with it. Diminishing the size of the nasal cavity could be done in various ways. The effect of stimulating the mucosa by the submucous injection of small quantities of paraffin made it appear that there was some dynamic action brought into play. Another means was the introduction under the mucous membrane of the septum of a small piece of the person's cartilage.

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Sufficient attention was not given to the action of douches on the nose. If hypotonic solutions were used they caused swelling of the mucous membrane. The use of plain water to which a little ether had been added acted well in some cases by causing swelling. Mr Charles Parker in a paper on ozæna stated that in some unilateral cases there was extreme deflection of the septum, the fetid crusts forming in the wide hollow on the concave side of the deflection. In these cases the cartilage of the septum should be resected, turned round and replaced; this seemed to be an ideal method of dealing with the condition.

Dr BROWN KELLY congratulated Dr Syme on his results. He believed in unilateral ozæna, but not in unilateral atrophy. When an atrophic process was present in the nose it affected the narrow as well as the wide side, but ozæna might be confined to the wide side. Therefore Dr Syme was justified in not doing a resection, but rather in trying to reduce the width of the open side. There were two difficulties, however, to which Dr Syme had not referred, viz., the thickness of the walls of the antrum often found in atrophic rhinitis, the cavity apparently not being fully developed; and the great discomfort to the patient caused by the application of dressings for ten days.

Dr A. A. GRAY said he agreed that there were different kinds of ozæna. One was the hereditary kind passed from parent to child, generation after generation. He thought that differed from the type due to an infection. It would be well worth while having a special discussion on ozæna.

Dr LOGAN TURNER said he agreed with Dr Syme that there was not, as a rule, unilateral atrophy. He (the speaker) had been surprised that such a large number of cases had associated sinus disease; Grünwald had held the view that in all cases of ozæna there was a focus of suppuration. He (the speaker) also endorsed Dr Gray's suggestion that it would be useful if the Section discussed the subject of ozæna.

Mr H. J. BANKS-DAVIS said that in the case of an atrophic rhinitis associated with antral disease, obviously, opening up the antrum and leaving a large opening ought to make the condition worse. He did not think the disease could be often associated with narrowness of the nostril, because it occurred frequently in young girls with normal noses.

Mr SYDNEY SCOTT asked Dr Syme how he excluded sphenoidal sinus infection; he (the speaker) found it difficult to say whether there was no sinus infection in a particular case. He was sure infection of the sphenoidal or ethmoidal cells could be overlooked. Did Dr Syme trust to X-rays as an aid?

Dr J. ALDINGTON GIBB said that twenty years ago a patient came to him with atrophic rhinitis, and both sphenoids were found to be affected. He opened and drained both thoroughly. He saw the patient this year, and the condition of the nose had then greatly improved; there was still some atrophy, but the nose was moist and free from crusts.

Dr SYME (in reply) said he had treated a fair number of cases by pushing the septum over to the other side by means of Asche's operation. In some he found the inferior turbinal atrophied on the narrow side and

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ozæna might occur from this procedure. He would be glad to hear, later, what experience Mr Howarth had had with the procedure which he (the speaker) had described in his paper. He did not claim that the method was his own, but the important point was that the whole antral wall was displaced. He did not see why one should not operate on the whole antral wall. Ethmoids had been a difficulty. He thought many cases of atrophic rhinitis were secondary to sinus disease. In cases in which there was ethmoid disease and discharge still remained, he intended in future to add the ethmoidal operation. He feared that in passing a wire, as described by Sir James Dundas-Grant, there was danger of perforating the septum. He did not see how one could keep the displaced wall in position by inserting cartilage. It would certainly be destroyed. Some form of easier packing might be devised. Ozæna was a very distressing and non-social condition, and for its cure patients would endure almost anything.

Cartilaginous Tumours of the Larynx: A Study of all the Cases recorded—IRWIN MOORE, M.Ch.—(The paper will be published in the *Journal of Laryngology and Otology*, January 1925.)

Ecchondrosis of the Larynx: Records of Two Cases successfully treated by Laryngo-fissure—Sir ST CLAIR THOMSON, M.D., F.R.C.S.—(The paper will be published in the *Journal of Laryngology and Otology*, January 1925.) Two cases, females, aged 53 and 56 respectively, are reported. Both were treated by laryngo-fissure. Diagnosis is difficult on account of the rarity of the tumour, the subglottic position, and the tendency to simulate malignancy.

DISCUSSION.

Mr E. D. D. DAVIS said he had assisted Mr Waggett at both operations in the case referred to by Sir St Clair Thomson. It was a chondroma of the cricoid, and was encapsuled. Mr Waggett attacked it from outside, by means of a long incision along the anterior border of the sterno-mastoid, exposing the tumour thoroughly. He then enucleated the tumour, taking care to preserve the mucous membrane of the inner surface of the cricoid, in order to prevent stenosis at a later date. Unfortunately, however, the tumour burst, and he scooped out the sago-like granules from the capsule. It was not cystic. The patient did well for two or three years, then the tumour recurred, and the operation was repeated, the tumour with its capsule being removed complete. In these, as in mixed parotid tumours, it was essential to remove the tumour and its capsule, and it was in those cases in which a complete removal with capsule intact had not been effected that a recurrence occurred sooner or later. The patient was in good condition, he had some voice and a fairly good airway.

Dr P. WATSON-WILLIAMS said he believed the case published by Mr Waggett was the one he (the speaker) had seen before and had not diagnosed correctly. When first seen by him there was nothing which suggested any kind of growth, there was fixation of one vocal cord, some subglottic swelling, and apparently some perichondritis, possibly septic, possibly syphilitic. On two separate occasions the Wassermann test

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proved weakly positive, though nothing in the history suggested infection. The improvement following anti-syphilitic treatment was so marked that he allowed the patient to go abroad and resume his duties on the Continent. Some months later the patient had such acute dyspnœa that tracheotomy had to be done. He was subsequently seen by Mr Waggett, who found an enchondroma. This showed that the onset of enchondroma in the larynx might be very insidious ; in this case it took some years to become obvious, for before coming under his (the speaker's) care the patient had been under Sir Charters Symonds for some time, and the laryngeal symptoms had been noticed for a considerable period.

Dr IRWIN MOORE said that Dr Watson-Williams saw the patient in 1915, whereas Mr Waggett did not see him until 1921. Sir Charters Symonds had previously seen the case at the end of 1914, and no definite cause of the paresis could be found.

Sir ST CLAIR THOMSON said that practitioners might more often endeavour to persuade patients to submit to an exploratory laryngo-fissure.

Methods of estimating the Activity of the Ciliary Epithelium within the Sinuses—A. LOWNDES YATES, M.D., F.R.C.S.Ed.—(The paper was published in the *Journal of Laryngology and Otology*, October 1924, p. 554.) As the result of experiment, it would appear that the severity of a sinusitis or sinus infection depends upon the power of the mucus to prevent the destruction of the epithelium by the inspired micro-organisms. If the property that mucus possesses of preventing the passage of water, and hence of water-soluble toxins, is destroyed, a progressively increasing poisoning of the ciliated epithelium by these toxins occurs, and, as the ciliary paralysis increases in amount, the secretion of mucus is also paralysed until finally the micro-organisms come to dwell in a symbiotic state in the sinus, and the toxins from them are readily absorbed, with the production of remote symptoms.

DISCUSSION.

Sir ST CLAIR THOMSON said that it was excellent research work like that of Mr Yates which raised the reputation of their specialty, and added much to the knowledge of the physiology of the body generally. He (the speaker) referred to his work on ciliated epithelium undertaken in conjunction with Professor Hewlett thirty years ago when they found that the pharynx of the frog was lined with it. They pithed the frog and having opened up the pharynx, a little piece of charcoal was placed on the ciliated epithelium, and its movements timed. It was moved along at the rate of one inch per minute, so that in two minutes intruders would be expelled from the nose into the vestibule. They also planted *Bacillus prodigiosus* on one another's nasal mucosa, and timed to see how long it took to disappear. Dr T. S. Kirkland of Sydney, who was a visitor at the Meeting, had found the accessory sinuses sterile in animals which were killed. The discovery of pus or microbes in the sinuses of patients

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dying of ordinary diseases did not necessarily mean that the cavities had been invaded in life. Professor Hewlett and he had studied the air passages in animals killed in the laboratory and found them sterile. Wurtz and Lermoyez, in Paris, claimed that mucus was bactericidal, but Professor Hewlett and he had only found it was inhibitory.

Dr P. WATSON-WILLIAMS said that it had been generally conceded that there was, in acute inflammatory conditions of the nasal mucosa, a shedding of ciliated epithelium analogous to that taking place in the acutely inflamed trachea and bronchi. It was the damage done to the mucosa in acute sinusitis which often determined the persistence of the infection. It would be valuable if a more systematic investigation could be made into the condition of the mucosal membrane when a sinus was opened and it was possible to remove a portion of the ciliated epithelium. Another interesting part of the paper was that concerned with tracing the course taken by discharges. He hoped these researches would be continued.

Dr LOGAN TURNER said that what interested him most in what Mr Yates had said was the course which the coloured material took in its passage from the antrum; it was similar to that of the course of the lymphatics as described by Grünwald in his experiments. The lymphatics of the antrum passed out through the ostium and along the upper surface of the inferior concha backwards on to the lateral wall of the naso-pharynx. Histological observations on the condition of the mucous membrane in chronic sinus infection showed that large areas became converted from the ciliated type to the stratified squamous type of epithelium, and possibly that was one explanation of the slower progress of the coloured particles held in the contained fluid.

Mr SYDNEY SCOTT asked what was the effect of cocain on the activity of the ciliated epithelium; also was it practicable to use an endoscope for the researches satisfactorily without cocain?

Mr YATES (in reply) said that he had made experiments on the point raised by Sir St Clair Thomson, using liquid paraffin, and the result was the same. It was a tenable theory that under the use of mucus or paraffin the organism was compelled to live with its own toxins, and therefore it died. He thought the death of the organism was due to auto-intoxication, rather than to any effect of the mucus. He had investigated the ciliary action within the maxillary sinus in two cases only, in both of which a bucco-antral fistula was present. The ciliary action took place in an upward direction on both the outer and inner walls of the sinus. The ciliary action began in the lowest portion of the antrum, namely, that part which lay between the roots of the teeth, and the origin of the two streams might be compared to the parting of the hair, and there was a sort of "no-man's-land" in between. Certain vessels in the pharynx were coloured by the fluid, but although these were in the position of the lymphatics he was uncertain whether the vessels so coloured were lymphatic vessels or perivascular lymphatics.

With regard to the effect of cocain on the ciliæ, if the nose was deeply cocainised the ciliæ were quite paralysed, but if the nose was cocainised lightly by spraying, there was generally very little action of the cocain

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in the middle meatus itself, and the ciliary movement in that situation went on. Sometimes it was difficult to be sure whether the paralysis was due to cocain, or to the toxin, and it was then necessary to repeat the experiment by anæsthetising a small area of the inferior meatus with solid cocain, making the injection of the dye through a cannula introduced through the anæsthetised area, and watching the effect upon the ciliæ of the middle meatus which were unaffected if this method was employed.

The Experimental Basis for Theories on Vestibular Function— Professor R. MAGNUS (Utrecht).—(The paper is published in the *Journal of Laryngology and Otology*, December 1924, p. 677.)

Labyrinthine Compensatory Eye-Positions in Patients— A. DE KLEIJN and C. VERSTEEGH (Utrecht).—(The paper is published in the *Journal of Laryngology and Otology*, December 1924, p. 686.)

Vertigo in Relation to the "Otolith" and "Neck" Reflexes —ALEX. R. TWEEDIE, F.R.C.S. (Nottingham).—(The paper is published in the *Journal of Laryngology and Otology*, December 1924, p. 691.)

DISCUSSION.

Mr SYDNEY SCOTT (Chairman) thanked Professor Magnus and Dr de Kleijn and also Mr Tweedie, who confessed himself their disciple; Mr Tweedie was largely responsible for having drawn the attention of members to the important work in Utrecht.

Dr J. S. FRASER said he felt with regard to the contributions of Professor Magnus and Dr de Kleijn, that as the research proceeded the phenomena and the reasons for them became clearer and clearer. He would be glad to have indicated by means of the hands, the position of the utricle and saccule in the human being with the head erect. Probably it was the same as in the rabbit. (Professor MAGNUS: Yes.)

In reply to a question which he asked Professor Magnus, the latter said the rabbit slept with the head in the same position which it occupied when it was running about, namely, forward, resting on its fore-paws. Human beings did not sleep in that posture as a rule, therefore the otolithic apparatus could not be in its "minimal" position when the person was lying on the left or on the right side, or on the back.

He (the speaker) asked whether any work had been done in Utrecht in regard to the effect of explosions on the inner ear. In examining the labyrinths of soldiers who had been blown up in the war, the otolithic membranes were sometimes found to be detached.

With regard to cocainising the inner ear, it was known how difficult it was to cocainise the middle ear from the operative point of view. He was interested to learn that in animals cocain could permeate so freely through the oval window, or the bone surrounding it, into the inner ear. It was true that in the microscopical examination of the ears of guinea-pigs one found that celloidin permeated into the inner ear more easily than in the human subject; in the latter, one had to open the superior canal to allow the fluid to enter.

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He also asked whether nystagmus was regarded as a symptom depending entirely on the canals or whether it was caused by the otolithic apparatus. It had been said that in sea-sickness, which was supposed to depend on the otolithic apparatus, nystagmus was absent. Dr H. S. Mygind attributed the fistula symptom to the otolithic apparatus and not to the semicircular canal.

What was the nature of the lesion in the last two cases related by Dr de Kleijn? The last-but-one might be an instance of congenital lesion of the pars inferior. He (the speaker) thought that such a case as the last one, an isolated lesion of the pars superior, must be very unusual.

Dr ALBERT A. GRAY said that he had himself suggested that all physiological sensation was the result not so much of stimulation, but rather of change of stimulation. If any nerve, or neuro-epithelium, or organ was stimulated it received a change in the degree or quality of stimulation, and if stimulation remained constant it had no effect; if the differential equalled nothing, no sensation was felt at all. In vision, for instance, this was obvious. There was a movement in which the stimulus was constantly changing, a change of intensity which was represented mathematically by the sine of the angle which represented the time. The same law held in the case of hearing and the sensation of heat.

There were no canals at all in the more primitive animals, but only otocysts. Beginning with the lamprey and going upwards, semicircular canals were found which were developed from the otocysts, and the canals could appreciate more minute changes in stimulation. If stimulation in the canals remained constant there was no sensation. A familiar illustration of that was the fact that in a moving railway train many individuals could sleep so long as a uniform speed was maintained, but as soon as there was a slowing of the train the canals responded to the change and the sensation thus produced checked the slumber.

Sir JAMES DUNDAS-GRANT said that the knowledge now possessed concerning the functions of the maculæ, utricles and saccules should result in more attention being paid to them in the future, without an exaggerated view of their value. Such small parts in such close contiguity, must often be affected together; it must be unusual for any of them to be the seat of isolated lesions. Dr Fraser had pointed out that the nerve which went to the posterior ampulla went also to the saccule, an observation which was very suggestive. The saggitta of the saccules was more displaced by putting the head to one side or the other. The other reflexes must be eliminated before a conclusion could be arrived at.

He (the speaker) wondered how long the effect of unilateral labyrinth extirpation lasted. The disturbance in connection with an eliminated labyrinth was probably due to the over-action of the normal labyrinth on the other side which was left unbalanced.

Mr E. WATSON-WILLIAMS said that two years ago he had made one clinical observation the significance of which he did not at the time appreciate. A signalman, between 30 and 40 years of age, complained that when he went up a ladder to attend to lamps, he became giddy; the giddiness came on when he put his head into a particular position, looking

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up and to the right with the left ear near the left shoulder. When his head was placed in this position, a coarse mixed nystagmus to the right was seen, lasting as long as the position was kept, at least for several minutes. The position of the head in space, and not in relation to the body, was what determined the giddiness. The caloric and rotatory tests were normal, and the condition was diagnosed as one of otolith disease, and demonstrated on several occasions. He had been hoping to show the case, but the man's trouble cleared up entirely, without treatment.

Mr F. J. CLEMINSON said that in the case of a small baby, two months old, there was no ear on the right side ; the pinna was undeveloped, and there was no meatus. The child always kept its head with the sound side turned upwards when placed on its back, and if laid prone it reversed the head. The mother said she had always noted this when the child was being bathed. Later, as the child became capable of fixing objects with its eyes, this orientation of the head was no longer observed. Probably no labyrinth existed on the side on which the ear was defective.

Mr W. IBBOTSON said he was to show that day a case of labyrinthectomy. Before doing the operation, he threw a concentrated beam of light into the eyes by means of the ophthalmoscope, and when it was thrown into the eye on the affected side, the patient fell in a vertiginous attack, which lasted for some time. No such effect followed the projection of light into the other eye. Since the operation, the reaction on both sides was normal. He asked what was the anatomical path of that reflex, whether it passed round the commissure of Gudden and into the red nucleus. He believed there was a connection between the red nucleus and the internal geniculate body.

Had Dr de Kleijn considered that there might be good hearing even though there was a lesion of the superior portion of the labyrinth, the vestibular labyrinth in its inferior part being unaffected? He did not see how it came about, because if the endolymph were continuous between the vestibular and the cochlear labyrinths he could not understand how there could be a lesion affecting only one part of the vestibular labyrinth, the inferior portion being healthy, with normal hearing.

Professor MAGNUS (in reply) said that Dr Fraser raised the question of the position of the otoliths in man. The measurements of Dr de Burlet were not yet published, but as animals always kept their head in such a position that the otoliths of the utricle lay almost horizontally, the same could perhaps be expected in man. In this case the situation of the macula sacculi would also be about the same in man as in animals. The observations of tonic labyrinthine reflexes on the limbs and of compensatory eye-positions in man were in accordance with this suggestion.

Dr Fraser's second question was very interesting, but also very difficult, namely, the position taken during sleep. During sleep the righting function was not operative ; usually people lay on their side and remained so. During sleep the centres of the mid-brain must be out of action. Because an animal took up a certain position in sleep it was not to be assumed that this depended on righting-reflexes.

With regard to the cocainisation of the labyrinth in man and in different animals, these experiments on cocainising the internal ear by injecting the

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middle ear only succeeded in the guinea-pig; in the rabbit and the cat they were not a success. He had no experience of cocainising man.

He knew that in the guinea-pig unilateral paralysis of the maculæ did not cause nystagmus and that paralysis of the canals on one side caused nystagmus. Whether *stimulation* of the maculæ on one side, with the maculæ of the other side intact, could give rise to nystagmus was not yet settled; therefore he could not give any definite opinion as to that.

He did not think it had been decided that the symptoms of sea-sickness only arose in the otolithic apparatus; he did not see why the canals should not co-operate in this.

In answer to Dr Gray, the investigations into muscular changes in animals had been made after complete extirpation of the cortex cerebri; therefore there were no reactions to subjective feelings in the experiment.

There was no doubt that the otolithic apparatus could give rise to tonic reflexes which remained constant for months, even for years. The same held good with the tonic reflexes arising in the proprioceptors of the neck and, according to the lately published experiments of Sherrington, also with the static reflexes of the body muscles arising from proprioceptive stimulus (myotatic reflexes). He agreed with Dr Gray in regard to the canals, but believed that the otolithic apparatus could maintain reflexes by a constant level of excitation. A possible but improbable alternative was that the otolithic stimulus was transient and that the maintenance of the reflex was of central origin.

In answer to Sir James Dundas-Grant, the direct symptoms of unilateral labyrinth extirpation could by careful examination be demonstrated as long as the animal lived. But after a few weeks or months they were more or less compensated, partly intracentrally, partly by other reflexes connected with posture, such as neck reflexes, righting reflexes, reflexes arising from the body and the eyes, etc. The amount that was contributed to the static functions by the labyrinths decreased as the animal scale was ascended, whereas the influence of other receptors increased. Therefore, after unilateral labyrinth extirpation the other sense organs would be able to compensate much more in the monkey and in man than in the rabbit and guinea-pig, so that in the former the symptoms soon became difficult of detection.

The questions asked by Mr E. Watson-Williams and Mr Cleminson, he would prefer Dr de Kleijn to answer. He had not had any experience in connection with the influence of the eyes upon vertigo.

Dr DE KLEIJN (in reply) said, in regard to the effect of explosions, that in a military man suffering from complete deafness on one side after shooting, the labyrinthine compensatory eye-positions were quite normal. He thought it only possible to settle the question in course of time after examining a great number of patients. He agreed with Dr Fraser that an isolated lesion of the pars superior labyrinthi was very unusual. The division of the labyrinth into two parts could only be applied to the peripheral labyrinth. The combination, saccule-posterior vertical canal, mentioned by Dr Fraser, we could expect in cases with lesions of the vestibular nerve. With regard to the opinion of Mr Ibbotson that the endolymph between the vestibular and cochlear labyrinths was continuous, and therefore a lesion of the pars superior labyrinthi only, was incom-

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prehensible, he (the speaker) said that this was only possible because the canalis utriculo-saccularis in man was very narrow.

After unilateral labyrinth extirpation in animals, the sound side was always carried uppermost as in the case of the patient mentioned by Mr Cleminson.

With regard to the attacks of vertigo, if the head was brought into a special position in space, he (the speaker) said that it was very difficult to explain these cases, because the attacks might be due to different influences: labyrinthine reflexes, neck reflexes, etc. Changes of pressure in the cerebro-spinal fluid and in the labyrinth, caused by changing the position of the head in relation to the trunk, might also exercise an influence.

Mr A. R. TWEEDIE (in reply to Dr Fraser's question) suggested that the reason we did not keep our utricles in what was presumably the normal position was, that men were not, so to speak, guinea-pigs; we had learned to disregard our otolithic functions in healthy conditions, and to rely more upon our tactile and other sensations. He further suggested that during sleep we relied mostly on these tactile sensations and our "higher" development. His own most comfortable sleeping posture was lying on his abdomen.

Naso-Pharyngeal Growths—Sir WILLIAM MILLIGAN, M.D.—(Paper published in the *Journal of Laryngology and Otology*, October 1924, p. 537.)—The various growths which occurred in the naso-pharynx were reviewed and treatment by radium was specially considered.

Mr SYDNEY SCOTT said that most of these cases were met with too late, because physicians who first saw the cases treated the symptoms, instead of investigating the possible cause.

Diathermy in the Removal and Treatment of Pharyngeal Cancer—Dr DAN M'KENZIE.—(Published in the *Journal of Laryngology and Otology*, October 1924, p. 545.)

Mr HERBERT TILLEY said that at a previous meeting he showed a very large specimen of naso-pharyngeal fibroma which arose from the basi-sphenoid, the lateral mass of the ethmoid and from the posterior wall of the left maxillary antrum. That was twenty years ago, and the patient was now a man in the best of health. He did not recommend lateral rhinotomy because it did not give sufficiently good access, but preferred an incision under the cheeks from one malar ridge to that of the other side. After retraction upwards of the soft parts the ascending process of the maxillary bone was removed and a portion of the anterior wall of the antrum. Another important detail was to cut through the floor of the nasal septum in its anterior portion, because it facilitated the exposure of the "field of approach."

A further important point was rapidity of removal of the tumour. Once there was a clear field and one got at the base of the growth, its removal should be done as quickly as possible. He agreed that one must get as near the base of the growth as possible; this, and quick working, enabled

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the surgeon to control the bleeding which was severe for the time being. He favoured laryngotomy and plugging of the lower pharynx before beginning the operation. This preliminary step gave plenty of "slack" in the cheeks because the mouth could be closed. A further advantage of a laryngotomy was that the anæsthetist could keep out of the way of the surgeon.

Mr MUSGRAVE WOODMAN said that carcinoma of the pharynx was a very important condition.

In regard to the upper part of the pharynx more attention should be paid to the diagnosis and life history of growths in this situation.

In January last he saw a case which struck him very forcibly. A patient came up complaining of slight blockage of the left side of the nose, with a little bleeding into his handkerchief, and some deafness in the ear. On examination a small reddish raised area was seen around the region of the Eustachian tube. A section was taken which proved it to be a squamous-celled epithelioma. Radium was inserted. A little later the same patient came with a slight bulging through the drum of the left ear, and paralysis of the sixth nerve. A section from the ear showed an epitheliomatous formation, and during the month which had elapsed between the two visits the growth had spread up the Eustachian tube. Two months later paralysis of the right external rectus began and pressure on the sympathetic, resulting in exophthalmos. A few weeks later the patient died in great agony from pressure on the fifth nerve.

The lesson of this case appeared to be that a growth in the upper part of the pharynx ran through the soft spongy bone and through the foramina of the base of the skull with great facility, and easily affected the nerves at the base of the brain. These growths, therefore, unless seen very early, must remain inoperable.

With regard to growths lower down in the pharynx, he directed attention to a feature in the life history. These growths tend to spread beneath the muco-periosteum of the pharyngeal wall and to present themselves as a round smooth swelling covered with mucous membrane. He agreed with Dr M'Kenzie that diathermy had revolutionised the surgery of the naso-pharynx. He (the speaker) considered that diathermy should be combined with surgery in this region. In most cases it would be wiser to approach the pharynx from the side, utilising the operative procedure suggested by Mr Trotter of tying down the sterno-mastoid to the pre-vertebral muscles, at which operation the glands could be excised and the external carotid artery tied. He did not advise puncture of the glands with the diathermy needle, but for the inside of the pharynx this treatment was invaluable.

He did not consider a fistula leading from the pharynx important; such a fistula often formed when diathermy had not been done, but it always healed up.

MR NORMAN PATTERSON said he had had many cases of naso-pharyngeal fibromata, and for four or five years he had ceased operating on them, as treatment by radium alone, or combined with X-rays, effected a cure. Dr Logan Turner would remember a case of a naso-pharyngeal growth extending into the zygomatic fossa and passing beneath the

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zygoma into the temporal fossa. The lad came to London, and he (Mr Patterson) removed the growth, but the patient died an hour later from shock. He treated a similar case with radium at the London Hospital and the recovery was perfect; and he had had other cases cured in this way.

He did not advocate the use of diathermy in the neck. In carrying out dissections for malignant glands he nearly always removed the sterno-mastoid. There was no fascia or muscle left to cover in the vessels. A complete clearance of both anterior and posterior triangles was necessary. In only one case had he found it advisable to occlude the lateral sinus before embarking on the neck dissection.

Dr J. ALDINGTON GIBB said in such cases he went round the fauces with a diathermy knife, and afterwards charred with a button. A lady, aged 65, had a malignant growth on the posterior wall of the pharynx and in the tonsillar region. The posterior wall growth was movable, and he stripped it off with the diathermy knife.

There was a case he had shown here, of extensive cancer of the tongue and fauces, and the patient was returned as inoperable by Mr Howell Evans. He (the speaker) diathermised it, and there was now no scar tissue remaining in the tongue. The floor of the mouth was involved to the alveolus, and he charred it rapidly with the diathermy button. The man was shown at the last meeting of the Section, and it would scarcely be realised that there had been any growth. Shrinkage of glands in the neck after diathermy was very noticeable, and now they had almost disappeared.

He asked whether the experience of operators had been the same; was there a blocking of lymphatics, or was it the development of something which was let loose as a result of the extreme heat of the diathermy? In the case of the man shown here, the glands still remained free, though it was now six months since the operation. On analysis, lecithin lipoid was found to the extent of four grains of the pure substance, and there was a large amount of fat which did not give the reaction of animal fat. He was wondering whether lecithin lipoid might have some effect on cancer growth.

Dr W. S. SYME said he was interested in hearing the results of treatment of these cases by radium; his own view agreed with that of those who said the radium treatment of these growths was not hopeful. Another important point was that of diagnosis, especially from the side of the ear. The purple appearance of the membrane, associated with pain on that side, made one suspicious of malignant disease.

He did not think a hard-and-fast line of treatment could be laid down for fibromata of the naso-pharynx: each case must be judged by itself. He had had a case of a large fibroma in a child aged 6, and he removed it completely behind the palate without doing anything to the palate or a preliminary rhinotomy. Another case he approached through the antrum—a very direct route; it gave a direct view of the side of the nose and of the side of the naso-pharynx. He would have been glad to hear more as to the after-history of the cases reported by Dr M'Kenzie, who had been using diathermy for a long time. For malignant disease of the pharynx, he (the

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speaker) agreed that diathermy was the most beneficent method; even in manifestly inoperable cases, much could be done to secure comfort for the patient. He did not agree with removal of the glands before attacking the primary growth, because frequently after removing the primary growth the glandular trouble diminished, owing to the removal of sepsis, and thickening of the cellular tissue disappeared. It was possible to remove the glands more easily some time afterwards.

There was room for an extension of the method of diathermy farther down the pharynx, and even in the œsophagus. He had applied the method through the œsophagoscope to the œsophagus, and though one did not look for cure, one patient was decidedly benefited. Naturally very great caution was necessary.

Mr NORMAN PATTERSON said he had found the best route of approach was through the palate, but not merely by splitting the soft palate, as that was not sufficient. The soft tissues of the hard palate were incised in the middle line, the flaps were elevated, and a large part of the hard palate and the posterior part of the septum were removed. Little or no deformity resulted. It was important not to split through the centre of the uvula, but to one side of it, as the incision was shortened and made through more vascular tissues.

Mr Harmer was the first to use diathermy in this country, and, after him, in 1913, Dr Lambert Lack. He (the speaker) assisted Dr Lack with his first case.

Mr A. D. SHARP said it was very advantageous to use radium in a case of naso-pharyngeal fibroma before operation. In the case of a young adult, who had all the features of naso-pharyngeal fibroma, he had used radium on two occasions, with the result that the tumour was reduced in size by half; and the patient stood examination with the probe without the occurrence of serious bleeding, which had not been the case before. He was able to remove the tumour by means of forceps and snare, and though at the operation bleeding was severe, it was controllable. He had great difficulty, on account of the rubber-like consistency of the tumour, in getting small radium tubes to remain in the tumour; the tumour seemed to push them out again. He had, therefore, to put them in through the nose and pack the nose with gauze.

Mr F. SYDENHAM asked how long the radium tubes were allowed to remain in position, and whether there was any danger of their falling out. Was it likely that there was any risk to the air passages?

Dr W. HILL said that at the Manchester Radium Institute they often employed the American method of embedding, merely glass-screened, radium emanation "seeds" in malignant growths of the buccal cavity and throat, and when these got loose and were swallowed apparently no harm resulted. He had had a personal experience of a string-moored and metal-screened emanation tube containing the equivalent of nearly 50 millicuries of radio-activity breaking away from its moorings in the throat; it took two days to pass through the alimentary canal; its regular progress was watched at intervals by aid of the X-ray screen and the patient was none the worse for the mishap. A laparotomy, however, would have been necessary if its

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progress had been long delayed at any point, *e.g.*, at the ileo-cæcal valve. It had been suggested that radium rays might possibly cause destruction of the hempen or silk or catgut ligatures used for mooring radium tubes.

Mr E. D. D. DAVIS asked whether Dr M'Kenzie or Mr Patterson had had cases of severe scarring after diathermy. He had seen three patients who had a large growth at the base of the tongue and pillars of the fauces removed by diathermy, and the scars were very painful and extensive, making swallowing difficult; trismus occurred, and food collected in the cavity left by removal of the growth. The pain and disability were so great that the patients were truly miserable. In one case he had found that X-rays had no effect on the scarring and on the pain.

Mr A. L. YATES said that the effect of X-rays was enhanced when the scar was a recent one, but the rays had very little effect on old scars.

Sir WILLIAM MILLIGAN (in reply) said that his object in bringing the subject forward was to ascertain what it was best to do in the surgery of these tumours, or whether any surgical interference should be attempted. He was not very particular as to what route of approach was chosen, so long as the approach was adequate. Much of the surgery of the back of the nose had been done somewhat in the dark; the region had not been approached sufficiently fully and clearly. Free access was very important, not only if one intended to remove the tumour, but even if one was to manipulate it with radium.

He agreed with Mr Sharp as to preliminary irradiation; for these tumours, whether innocent or malignant, were very vascular, and arrest of hæmorrhage by irradiation was very valuable; it also diminished the size of the growth, rendering the choice of operation easier.

When radium was used these tumours were implanted with a barrage of spicules, *i.e.*, tubes containing radium emanation, not the actual salt. Exposure of the tumour was necessary so as to get the spicules deeply embedded and arranged symmetrically, in that way ensuring cross-firing in all directions. The spicules were retained from twelve to twenty-four hours, the time and number varying with the size and character of the tumour.

With regard to what became of the spicules, they either become encysted in the fibroid mass which resulted from the irradiation, or they came out and were either swallowed or coughed up. He had never seen any trouble follow after using these spicules in laryngeal growths. For laryngeal growths it was unquestionably better to do a laryngo-fissure, so as to secure free access to the growth and a clear route for the tubes.

Dr Hill had referred to another method of using radium in the naso-pharynx, and he (the speaker) would refer to still another. Passing the tube through the nose he did not think was a good plan. There was a method named after Burwood. In this, the radium tube was encased in a little almond-shaped piece of wax, to which a silk thread was attached, and in that way it was drawn up into the naso-pharynx and tied. The irradiation used was from the beta- and gamma-rays. The spicules were made in the laboratory by a boy whose duty it was to do this. They were glass tubes, which were pulled out until their diameter was 0·03 of a

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millimetre. Each tube was then filled and cut into segments with a blowpipe, and twisted off.

He thought the secret of success in regard to these growths was the way in which they were exposed, whether doing a surgical operation, or trying to get rid of them by radium or by diathermy.

Dr DAN M'KENZIE (in reply) said that for the pain after operation he usually gave a little morphia ; in some cases there was very little pain. Swallowing movements were quickly accommodated to the new conditions, and no special method of feeding was called for. He always ordered a throat spray, but more as a placebo than anything else, as the wound was sealed aseptically.

With regard to scarring, he had had a case in which there was a suspicious growth on the inner side of the cheek, and he removed the inside of the cheek without damaging the exterior, and the scar contracted so much that the patient could not open her mouth, but Dr Hernaman-Johnson, who had sent him the case, applied X-rays to the scar, and in two or three months one would scarcely have thought there had been a scar there at all.

The interval between the two operations had varied in his cases from a few days to two or three weeks. He preferred to do the outer one first, in order to be able to remove the primary growth of the pharynx as thoroughly and deliberately as possible.

A Preliminary Note on the Results obtained in some Experiments in which the Facial and Recurrent Laryngeal Nerves were Anastomosed with other Nerves—Sir CHARLES BALLANCE, K.C.M.G., C.B., M.V.O.—(This paper is published *in extenso* (with illustrations) in the *British Medical Journal*, 30th August 1924, p. 349.)

The results presented to-day must not be looked upon as final. Many experiments are in progress, and every experiment seems to open out the need for further experiment to elucidate some point which is not quite clear.

(1) *The Recurrent Laryngeal Nerve.*—Two of the experiments are end-to-side anastomosis of the recurrent laryngeal with the vagus; and end-to-end anastomosis between the descendens noni and the recurrent laryngeal. When I speak of a result of an experiment it is really the result of several.

With end-to-side anastomosis of the recurrent laryngeal with the vagus, it was found there was no movement of the vocal cord at all in tranquil respiration. What it is desired to obtain is physiological movement during tranquil respiration. At the end of six months partial asphyxiation caused a movement of the vocal cord, that is, the cord slightly abducted on inspiration. At the end of fifteen months, when the wound was reopened and the vagus was stimulated above the point of anastomosis, the vocal cord abducted, but at the end of eighteen months there was no movement on

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tranquil respiration and no movement on partial asphyxiation. This shows there was a definite degeneration of function, from the period three months previously, when partial asphyxiation caused abduction of the cord. At the present time the wound in this monkey has not been reopened, and the vagus has not been stimulated again above the place where the recurrent laryngeal was anastomosed to it. So I cannot answer the question as to whether with such stimulation there would still be abduction. The laryngeal muscles are probably becoming shortened and atrophied from non-use, and the operation has been a failure.

I may mention another point about the vagus nerve. It consists of many bundles of nerves, and each bundle probably has a definite function to fulfil. The little bundle of fibres which forms the recurrent laryngeal is quite distinct from the rest of the vagus nerve. In an anastomosis between the vagus and recurrent laryngeal nerves it is a matter of chance whether the recurrent laryngeal nerve is attached to that part of the vagus where the recurrent laryngeal nerve bundles are situated. In several instances I have attached the recurrent laryngeal to the tracheal side of the vagus, but I have never yet succeeded in obtaining movement of the vocal cord in tranquil respiration as a sequence to the anastomosis. I think the main reason is that I do not hit upon the little group of nerve bundles which are a continuation of the recurrent laryngeal in the vagus nerve.

A similar result takes place when end-to-end anastomosis of the descendens noni with the recurrent laryngeal is performed. After about three months the appearance of the cord becomes normal, it is no longer slack, it is straight, and its tone is good. After five or six months, if the animal is partially asphyxiated, an abduction movement of the vocal cord is seen. At the same time if the wound is opened and the hypoglossal, the descendens noni and the point of anastomosis are stimulated there is an abduction of the cord. This experiment does not, therefore, seem to be the method of obtaining physiological movement of the vocal cord.

As the vagus and descendens noni nerves failed to produce the desired result, other nerves which might be used had to be considered. The nerve to the serratus magnus was excluded, because the muscle is only used, if at all, in forced respiration. The second intercostal nerve might possibly be brought up through the upper opening of the thorax and joined to the divided recurrent laryngeal; but that seemed to be rather a complicated operation.

Then it occurred to Mr Colledge and myself that, besides the recurrent laryngeal nerve, the phrenic nerve functions in tranquil respiration. The diaphragm moves rhythmically with the vocal cord and hence it was determined to use the phrenic nerve. The phrenic

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was divided, and the recurrent laryngeal was united end-to-end with the phrenic. Then it was desirable to arrange for the recovery of the diaphragm; and so the distal end of the phrenic nerve was united end-to-end with the proximal cut end of the descendens noni nerve. As the latter was cut, we had to think as to how we could prevent atrophy of the depressor muscles of the larynx and hyoid bone. So the distal cut end of the descendens noni was anastomosed end-to-side to the hypoglossal. I may tell you at once that these depressor muscles of the hyoid bone are functioning, and the electrical reactions are normal; and Dr Eidinow reports that the diaphragm is working normally through the descendens noni. How it does so I do not know, perhaps Sir Frederick Mott can tell us. And as to the important anastomosis between the recurrent laryngeal and the phrenic, on examining the vocal cords at the end of a few months, we could see that both were acting harmoniously. A short time later we found that the vocal cord which was being energised through the phrenic nerve was working much too vigorously, though synchronously with the other cord. I suppose it is natural that it should be so, because the nerve current flowing along the phrenic to the diaphragm must be very much larger than that passing along the recurrent laryngeal. The phrenic-recurrent laryngeal anastomosis is a fundamental experiment; and various experiments are now in course to determine the best way of anastomosing the recurrent laryngeal to the phrenic in order to recover normal movement of the vocal cord. It is obvious that the whole phrenic is not required.

There is still much to do. All the anastomoses are subjected to microscopical examination. Monkeys are difficult to keep alive; sometimes a lethal epidemic arises, and then the experiments have to be begun over again.

(2) *The Facial Nerve.*—In 1895, the first anastomosis was done for the relief of facial palsy. The operation was an end-to-side anastomosis of the facial into the spinal accessory. The result of these spinalis anastomosis cases was practically and universally this: that recovery of the face was obtained after many months, but movement of the face was associated with movement of the shoulder: thus, if the shoulder was moved, the whole side of the face twitched. This was very marked and disfiguring, especially in a patient who would laugh and talk. It is important to remember that in doing a nerve anastomosis we must try to stick to one objective. I had tried to cure the face and not interfere with the sterno-mastoid and trapezius; and I failed. Whatever form of facial-spinalis operation is done, there always follows some weakness of the sterno-mastoid and trapezius; and in women who wear low dresses the deformity of the neck is very noticeable.

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In these circumstances it was natural that surgeons should look out for some other nerve to anastomose to the facial. The next nerve which was employed was the hypoglossal. I read a paper on facial anastomosis at the German Surgical Congress in 1902, and Professor Körte read a paper on the same subject. Each of us described one case of facial-hypoglossal anastomosis, and the result in each case was good. End-to-side anastomosis of facial and hypoglossal was at first done; and then afterwards, when the result was not perfect, the surgeon turned back the whole of the hypoglossal, making an end-to-end anastomosis. In order to save the tongue from atrophy, a slip was taken from the spinal accessory and brought across the neck and united end-to-end to the distal segment of the hypoglossal. Another operation was descendens noni-facial anastomosis end-to-end.

Eighteen months ago I operated on a patient in whom the whole hypoglossal was turned backwards so as to be united end-to-end with the facial; and the divided descendens noni was united end-to-end with the distal part of the hypoglossal. In this case there has been a remarkable, and nearly a complete, recovery of the face, but there is still an associated movement of tongue and face, but this is becoming less and less. At dinner (for some months) this patient, as she ate and swallowed, suffered considerable movement of the side of the face, but this is now gradually disappearing.

The question was considered as to what other nerve could be used for anastomosis with the facial. Facial-glosso-pharyngeal and facial-lingual anastomoses were carried out experimentally. The glosso-pharyngeal was turned back and united end-to-end with the facial nerve. No branches of the glosso-pharyngeal are interfered with except the sensory branches going to the circumvallate papillæ and the side of the tongue. The result of facial-glosso-pharyngeal anastomosis is early recovery of the paralysed face muscles. The glosso-pharyngeal is connected with the facial nerve in various ways. I think these communications must have something to do with the good results which have been obtained from the anastomosis between the glosso-pharyngeal and the facial nerves.

There is a great deal more to be said, but the two points needing special emphasis are the following: (1) I think the glosso-pharyngeal is the nerve which should be used by surgeons for the recovery of motion in the face in cases of paralysis. (2) I think that some portion of the phrenic is the proper nerve to use in order to obtain recovery of movement in paralysis of the vocal cord.

Sir DAVID FERRIER, F.R.S., said he had admired the technique of Sir Charles Ballance's operations. He had also been able to study the functional results, and he could verify all that Sir Charles had said.

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The last operation—anastomosis of the glosso-pharyngeal with the facial—seemed to be the most interesting of all, and the results were very satisfactory.

In operating on the small nerves of the monkey and lower animals, he thought it would be well if some method could be discovered of keeping the cut ends in accurate apposition without the use of sutures, as it seemed to him the latter must damage both the proximal and the distal ends, and so at least delay recovery. On his (the speaker's) suggestion, Sir Charles used some glutinous material for the purpose, composed of finely pounded muscle.

Sir FREDERICK MOTT, F.R.S., said he examined the animals, and was unable to see any movement of the vocal cord. He was impressed with the success of the anastomosis of the phrenic. He thought he could understand it. One must think that the abductors of the vocal cords had association cells connecting the nucleus of the phrenic with the abductor nucleus. But what had to be considered was, why did Sir Charles carry out the operation? A person with a paralysed recurrent laryngeal could breathe satisfactorily, after anastomosis of the recurrent laryngeal with the vagus, but he could not speak, and the question was as to whether vocalisation could be restored by anastomosing the phrenic. The monkey could make a noise, but a gibbon was a better animal for the purpose, as it had a remarkable larynx. Its thyro-arytenoid muscles had fibres inserted into the vocal cord (vocal muscle), and this might explain the remarkable vocal powers of this animal, which could imitate the bark of a dog or the shrill notes of the guinea-pig. He suggested that Sir Charles should make experiments on the gibbon.

He (the speaker) once did an experiment on a monkey, removing all the area of the cortex on both sides, which by excitation yielded movements of the vocal cords, and he had scarcely finished the operation when he was told that the animal was now barking quite as well as it did before. Barking might be represented at a lower level.

He had seen, that day, a lady who had had a considerable amount of movement restored by anastomosis of facial and hypoglossal, but he was disappointed because he did not think the tongue had recovered to the extent one could have wished. Unless there was much more return, it was a question whether it would be wise to do the operation.

One experiment Sir Charles showed was very satisfactory, namely, anastomosis of the facial with the glosso-pharyngeal, because the muscles on what was the paralysed side responded very well indeed, and he thought that in a short time the response on the two sides would be equal.

Dr W. S. SYME referred to the case of a man whose vagus nerve was destroyed by a war injury. When he saw the man, there was paralysis of the left nerve, and Professor Kennedy removed the cicatricial tissue round the vagus, and sutured the two ends. Two years later there was no return of function. Professor Kennedy had also done for him (the speaker) a successful anastomosis of the facial with the hypoglossal, but it took a long time for function to return. The ultimate result was however most satisfactory.

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Sir WILLIAM MILLIGAN said that three years ago he had a case in which he anastomosed the facial and hypoglossal nerves, and the difficulty mentioned by Sir David Ferrier of uniting the ends of the nerves without a suture if possible, made him (the speaker) think of the following method. He wrapped the two nerve ends in gold leaf, and then tied a very thin silk thread at the upper end of one cut portion, and at the lower end of the other cut portion, so that there was a little traction on the two ends in the direction of keeping them together. He saw the patient nine months later, and there was a return of function, though not very good. The patient then went abroad. He asked Sir Charles Ballance's opinion of the method.

Sir CHARLES BALLANCE (in reply) said that in certain cases success had attended anastomosis without suture. A piece of muscle was removed from the animal being operated upon, cut very small, placed in a small, sterilised mortar with the addition of three or four drops of sterilised salt solution, and it was pounded up so as to form a sticky mass. The sticky mass held the nerves in contact.

He had not been asked if he had done a glosso-pharyngeal anastomosis in man. He performed one on 12th March of this year (1924). The woman was operated upon sixteen years ago by a member of the Section of Otology, and since then she had had total facial paralysis on the right side. In June, *i.e.*, a month ago, Dr Bailey reported that the muscles on the paralysed side of the face reacted to a galvanic current, of the same strength of current as on the opposite side. On 3rd June he (the speaker) was sure there was slight voluntary movement at the angle of the mouth, and of the orbicularis oris. It had seemed to be a hopeless case, but he thought the patient would recover as there was already great improvement in the tone of the face, and there was no longer an overflow of tears from the eye; there was almost the same extent of palpebral fissure on one side as on the other.

Referring to Dr Syme's case of destruction of the vagus nerve, he (Sir Charles) said that he had cut the vagus on one side in a large he-goat, and that he had failed to discover that the animal was afterwards inconvenienced in any way.

In one of his baboons he did an end-to-side anastomosis of the recurrent laryngeal with the vagus, and on the twentieth day afterwards it died of acute pneumonia. Though influenza was rife at the time, he could not help thinking that the operation had something to do with the pneumonia. He therefore thought that if the laryngeal nerve was to be anastomosed, the vagus nerve should not be used, because of the danger of some such complication. Chevalier Jackson had recently recommended the use of the vagus, but he (the speaker) disapproved of this, because of the experimental results.

In answer to Sir Frederick Mott, he would be pleased to receive a present of a gibbon if anyone would kindly send him one, and it seemed to him that if the two Sections would provide two or three chimpanzees and a gibbon, in a couple of years there might be agreement as to some definite course of action to adopt, when it was desired to operate for facial palsy or for paralysis of a vocal cord.

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Royal Society of Medicine

The Clinical Importance of Nasal Sinus Infection in Mastoiditis—PATRICK WATSON-WILLIAMS, M.D.—(The paper is published in the *Journal of Laryngology and Otology*, October 1924, p. 561.)

DISCUSSION ON OTOLOGICAL AND RHINOLOGICAL PROBLEMS IN SCARLET FEVER AND MEASLES.

Mr T. B. LAYTON.

I shall epitomise the problems in connection with scarlet fever and measles, dealing first with those which are otological, and then with the rhinological. My first remarks will refer to scarlet fever, the later with measles.

In scarlet fever the otological problems are those connected with otitis media, and those connected with mastoiditis.

In the majority of cases of otitis media seen in ordinary practice the first symptom which draws attention to the disease is pain, but in most cases in scarlet fever pain is wanting. Therefore I think the first problem is how to recognise the case of otitis media before there is otorrhœa. Any suggestions in regard to this will be of the utmost value to those working in a fever hospital. The next problem is that of treatment. This will depend on the condition of the ear and on the state of the patient. If there is a drumhead which has not yet burst but is ripe for incision, the proper treatment is to do a primary paracentesis. It is difficult to persuade medical officers in charge of cases that a patient is more likely to do well if that is done than if it is allowed to burst. From the otological point of view, I would like to hear remarks on the value of secondary paracentesis, *i.e.*, incision of a drumhead which has already ruptured but in which there is otological evidence that the discharge from the middle ear is not quite free. The other subject connected with the treatment of otitis media in scarlet fever is that of operation on the throat and naso-pharynx. Should operations on tonsils and adenoids be performed? If they should, at what stage? And should there be removal of tonsils and adenoids, or of adenoids only?

The third problem is to study the natural termination of otitis media in scarlet fever. In a large number of the cases of children suffering from chronic otitis media this is attributed by the parents to scarlet fever. Some of these cases, however, come on after the patient has recovered from the scarlet fever. I had a good example of the latter. I was told there was a child in the hospital with an attack of scarlet fever who had had an attack three and a half years before, and that I had done a mastoid operation on the child when it was previously in hospital. I asked how the mastoid was going on, and the doctor said it had been suppurating ever since. I saw the child, and recognised I had not done the operation. The operation had been performed six months after the child left the fever hospital, and there had been no suggestion—the notes had been kept—of any otitis media during the attack of scarlet fever.

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In connection with county school work there seems to be a considerable amount of ear disease which originated from scarlet fever, leaving destruction of the middle ear and considerable deafness. In the hospital the majority of cases heal up without perforation, or, if there is a perforation left, it is a small one. It is difficult to find in fever hospitals the cases described in text-books as typical otitis as a result of scarlet fever, with almost complete destruction of drumhead, or with very large perforations.

Supposing it is impossible to get the ear dry, what is the risk to the patient? Secondly, how long should such a patient be kept in hospital? If a patient is not discharged because of a running ear one is faced with the alternative either of keeping the child in hospital for a considerable time, or of doing a mastoid operation, possibly a radical one. From the point of view of other people, there arises the question of the degree of infectivity of a child with a running ear. I have taken up the standpoint that the question as to how far these cases are carriers of scarlet fever should be left to the hospital authorities; that, whether the child can be allowed to go home with safety to other children should be for the medical officers in the fever service to decide; but that it is my responsibility to say whether it is better in the interests of the child to be discharged with active disease still present or whether further treatment should be attempted in the hospital.

The carrier problem is, however, one that we must consider in the near future, and this brings us to the question of the cases in which the Klebs-Loeffler bacillus is present in the nose of children on whom it is desired to operate for otitis media.

Passing from otitis media to mastoiditis, two problems have to be considered: first, that of diagnosis, then, that of treatment. It is the aim of the otologist to diagnose mastoiditis before there is any retro-auricular swelling. I ask if any members have suggestions as to how the diagnosis can be made in children with scarlet fever. They do not often complain of pain, though, not infrequently, they have tenderness, and this may occur during the apyrexial stage of the disease. I do not remember having diagnosed mastoiditis until a swelling had appeared. And the diagnosis is made more difficult because one of the great complications of scarlet fever is the presence of enlarged glands in the neck; it is difficult to tell whether the swelling is due to mastoiditis, or to enlarged glands in the neck, or to the two combined. On one day I saw two cases at the fever hospital in which mastoiditis was thought to be present. The first case I thought was due to gland enlargement, and in the other case I did not think there was any doubt that it was Bezold's mastoiditis. I was wrong in both cases: that regarded as glands, was a mastoid case, and the one considered a mastoid, was a case of glands. Cases must be judged individually, according to the position of the swelling and the observations from day to day.

Turning to the treatment of mastoiditis in scarlet fever, all the authorities on scarlet fever, whom I know, say there is not any great anxiety with regard to the extension of the disease from the bone to the meninges, and I incline to agree with them. One can postpone diagnosis in scarlet fever with greater safety and for a longer time than in the ordinary mastoiditis of hospital or private practice. This will influence the way in which the treatment is approached. We agree that some form of operative treatment

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is necessary. What should it be? Should it be the simple Wilde's incision, or the simple mastoid operation? Should it be the Schwartze, with removal of diseased bone? Should it be the conservative operation with meatal flap? Or should it be the radical operation? Which of these should be done is a matter for discussion in varying conditions and cases.

When we pass from scarlet fever to measles, the problems are probably much the same, but they are more difficult to tackle. Moreover, there are fewer opportunities of studying them, as there are not many cases of measles taken into fever hospitals. Another point is that sufferers from measles are much younger children, and they are so seriously ill, when admitted, that examination of them is difficult. The child may be killed in attempts to get the otitis media well.

Turning to the nose and throat, the problems before us are those connected with rhinitis and pharyngitis and sinusitis. The medical officers in charge of cases deal chiefly with the rhinitis and pharyngitis and the question is chiefly one of syringing *versus* not syringing. The majority of those whom I know engaged in this work have given up syringing the throat in infectious disease, and their results since are as good as, or better than, before.

I do not think sinusitis is very common during infectious diseases. I do not know how to diagnose it until a swelling is seen in the face. In three years I have seen only three such cases of sinus disease.

Mr SYDNEY SCOTT expressed the gratitude of members to Mr Layton for having opened the discussion on a subject the importance of which was not yet realised by the outside public, not even by those in the profession who were not specialists, nor perhaps even by all medical superintendents of fever hospitals, though a change was now taking place.

Dr KERR LOVE said he considered that, as an aid to treatment, tonsils and adenoids should be removed as soon as practicable, *i.e.*, after the fever had subsided. The risk of aural complication would thus be diminished; if such complication had occurred its duration would be shortened.

No authority was entitled to dismiss from a fever hospital a patient who had had ear discharge, until that discharge had ceased. If in two or three months it had not ceased, the mastoid process must be opened. Under the present imperfect arrangements patients were being dismissed before the cessation of the ear discharge. He (the speaker) thought that certainly the school authorities should not readmit such a patient to school, whether the discharge resulted from scarlet fever or from measles. The point was raised at a recent meeting of the Scottish Society of Otology and Laryngology, and he (the speaker) had already asked the school authorities for the County of Dumbarton and those for the City of Glasgow to take that view, which he believed would prevail.

With regard to the occurrence of more serious complications in connection with these two diseases, a few months ago he had operated on the right maxillary antrum of a girl who, some months before, had had scarlet fever, and he believed the antral condition had been due to the scarlet fever. More recently he had operated in a school clinic upon a child in whose case complete sinus thrombosis was due to an attack of measles months previously.

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He thought it would be the duty of this Society to make a move in the direction of getting the consciences of medical officers in charge of infectious diseases hospitals aroused on this important subject and getting them to co-operate more thoroughly with otologists, too few of whom had been appointed in connection with such hospitals.

Sir WILLIAM MILLIGAN said that, when he was President of the Otological Section of the British Medical Association at its Manchester meeting in 1902, he had brought forward a resolution asking that the authorities would take this question into consideration, and make appointments accordingly. That was carried unanimously. Yet now, in 1924, few civic authorities had given effect to the request. He agreed that it was incumbent upon such Sections as theirs to lead in semi-political matters as well as in scientific ones; every social and political means open should be used to bring home to the authorities the need for more to be done because of the danger to the rising generation. Otologists knew how destructive these processes were, and how they handicapped children in their struggle through life. One solution was the appointment of men competent to investigate these cases, which should be investigated daily, for the greatest success rested with those who caught the cases early. It was a policy which he was at the moment discussing with the Manchester Corporation; he had recommended that at least two otologists should be appointed to inspect the scarlet fever cases in the fever hospital. Objection might be taken on the score of expense, but in the first year such an appointment was made in Edinburgh, the stay of patients in hospital was much shorter than formerly, therefore even financially it was well worth while.

What was the difference, in regard to the effect on the ear, between scarlet fever and measles? In scarlet fever the tendency was for the infection to invade bone, in measles the tendency was to involve mucous membrane. Some years ago he had said that in scarlet fever cases the whole middle-ear cleft was invaded, whereas in measles there were segments of the middle-ear cleft which could be invaded independently. In measles there could be a pure tubal infection, whereas in scarlet fever the tendency was for the disease to be generalised in the cleft and to invade bone secondarily.

Another important matter was the part played by the surgeon in the conduct of a case it which in was known that tonsils and adenoids were present. Adenoids should be removed during the infectious stage the moment the temperature came down; it was not prudent to wait for this until convalescence, for early removal of the material expedited recovery and saved the ears.

There was a great difference between cases seen in private and those seen in hospital. He did not recall an early case seen in private which needed after-treatment of an urgent character, for he did not wait until the membrane bulged; as soon as it showed congestion, he incised it. One should anticipate pathological events, and, from the first, facilities for free drainage should be provided. If the perforation were a pin-point one, it should be freely enlarged to permit of free drainage.

With regard to what the authorities should do in the case of a child with running ears, was an authority entitled to discharge a patient in such a condition? The individual was a possible carrier, and therefore

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a public danger, and the authorities should insist on his being detained in hospital until he had entirely recovered. It might be a number of months, but it would not be so long if it were known that this would be the system, for some type of operation would be done at a much earlier stage than was the custom now. If careful treatment for two months did not stop the discharge, he thought the patient should be submitted to a mastoid operation. At present these children went out, they disseminated infection, and so a vicious circle was formed.

Mr J. ADAM said he had had the impression that a chronic suppurative otitis after scarlet fever always needed a mastoid operation. At the Child Welfare Hospital at Motherwell he saw many children and he asked the medical officer of health to give him some statistics. In five years he had 1370 cases of scarlet fever, and among these were 62 cases of otitis media. Twenty per cent. of the 62 were not dry on dismissal, 80 per cent. had dried, none had paracentesis done. Only five of them required a mastoid operation. That supported what Mr Layton said: that cases of scarlet fever otitis mostly got well, even if no operation were done, and that the bone was not involved so often as one was led to expect.

Dr DAN M'KENZIE said a child who had been under his care at the Central Throat and Ear Hospital for otorrhœa developed scarlet fever and was removed to the isolation hospital. She was taken in again seven or eight weeks later and, within a week of her arrival, the children in the cots beside her developed scarlet fever. He did not see how it was possible to avoid an accident of that kind. He raised a question he brought forward some years ago, namely, whether these cases should not be more frequently operated upon by way of the mastoid. The problem of secondary paracentesis should never arise. If primary paracentesis failed to cure the case, why not drain the antrum? Posterior drainage of the middle ear only took a few minutes to perform, and the route of discharge was thereby transferred from the meatus to the mastoid, so that healing of the membrane was facilitated. One sign to which he found himself attaching more and more weight as an early indication for posterior drainage was deep meatal œdema close to the membrane. If, after paracentesis, the discharge continued profuse longer than for three or four days, some mastoiditis was occurring. If posterior drainage failed to cure the disease, it was a case for the radical mastoid operation.

The position he had now arrived at was actually as follows: In a case of acute suppuration of the middle ear, which was not getting well and in which there were enlarged tonsils and adenoids present, it was safer and better to do posterior drainage through the mastoid first, before trying the effect of removing the tonsils and adenoids.

Dr NEIL MACLAY said that for three and a half years he had acted as otologist at the City Fever Hospital, Newcastle-on-Tyne, where the scarlet fever admissions were 500 to 600 per annum. He was familiar with otorrhœa or otitis media showing themselves during the second week of the disease; he had never seen them in connection with the large devastating perforations which were described in the text-books. Usually the onset of the discharge from the ear was unaccompanied by pain;

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generally the first knowledge of it came from the report of the nurse that discharge was seen on the pillow in the morning. It was most difficult to anticipate this by paracentesis, even if the ears were examined every day. Soon after admission, an effort was made to cleanse the mouth, nose, and fauces, as well as the external meatus. Many cases had hard wax plugs and epithelial débris in the ears, and varying degrees of external otitis. If a membrane ruptured into a fairly clean external canal there would be a better chance of natural healing. Many of the children had septic teeth, gingivitis, even pyorrhœa, and those conditions should be treated promptly. The nasal douche was not used. If tonsils and adenoids were present, they were removed, and at an early period. By treating cases in this way, the stay in hospital of patients had been reduced from fifty-eight or sixty days to forty days, representing a considerable saving to the civic authority. There had been a singular freedom from mastoid implication: he had only done one or two mastoid operations in three and a half years in that hospital. But he had seen, fairly frequently, post-auricular cellulitis, which responded to post-auricular incision and drainage. In two such cases he had investigated the mastoid cell area and not found osteitis. It was associated with a type of external otitis, which was believed to be peculiar to scarlet fever. It was not furunculosis, but a sub-epithelial inflammation due to the streptococcus.

Dr J. S. FRASER said he was glad to hear the references to false economy; the authorities seemed to have acknowledged their mistake. Dr W. T. Gardiner held the view that it would not make much difference if early paracentesis were performed in these cases, and he had had a large experience as otologist in a fever hospital. Difficulty in getting permission to perform the operation was experienced: parents should be asked to sign a form of permit on admission to a fever hospital, as in the voluntary hospitals. Dr Gardiner had laid stress on the different mentality of the parents of a patient entering the voluntary hospital as compared with those of a patient entering a fever hospital. Removal to the latter was compulsory, and parents were not equally willing to have an operation performed.

He agreed with Dr M'Kenzie as to secondary paracentesis. He (the speaker) had never seen that a secondary paracentesis did any good at all. If the spontaneous rupture of the membrane did not result in the clearing up of the acute otitis media within three or four weeks, the mastoid should be opened.

Too little stress had been laid in this discussion on the rhinitis of measles. He felt that cure of the rhinitis resulting from scarlet fever and measles would obviate ozæna in the future, because the main cause of ozæna was the rhinitis following those two diseases. Ozæna really corresponded to chronic middle-ear suppuration and cholesteatoma in the middle ear.

Mr HUGH JONES reminded members that just before the war a full discussion took place on this subject at the International Medical Congress, and a Superintendent of the Metropolitan Asylums Board at that time said that chronic suppurative otitis media had never resulted from scarlet fever. Every otologist present was much surprised at this statement. Often the connection was absolutely certain, but it must be admitted that misleading

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histories were sometimes given. He remembered two cases which were sent from a fever hospital, in which the discharge was supposed to have entirely stopped, but three days later the patients turned up at the eye and ear infirmary with renewed discharge. Both patients had perisinus abscesses. He supposed that in many of the cases there was a temporary cessation of the discharge, or the discharge was so inspissated that there was no external evidence of it, and the non-expert, assuming it to be cured, sent the patient out. At the date of which he was speaking the speaker arranged a sort of liaison between the Superintendent of the Liverpool fever hospitals and the ear hospitals, the idea being to have the ear hospital case-sheets started in the fever hospitals, and continued afterwards in the ear department to which the patient was referred. Each patient with otitis on discharge from the fever hospital was to be sent direct to an ear hospital or department. This plan worked for three months, then the war intervened. During the three months' period the speaker, rather to his surprise, saw only one case of scarlet fever, and seven of diphtheria, and he concluded that there were similar problems in connection with diphtheria, to those in connection with scarlet fever and measles. Once patients had been discharged from the fever hospital it was difficult to get parents to bring them for treatment, as they thought nothing further was required. The necessity for following up these cases should be strongly represented to the civic authorities.

He remembered an epidemic of measles in a large preparatory school, in which he was asked to see the cases of otitis which occurred. There were forty cases of measles, and about twelve of acute otitis media. Seven of the latter required paracentesis, two needed the mastoid operation. The medical officer said he believed the whole trouble was due to the fact that all the boys had been using a douche, and the speaker thought he was probably right. This led him to deprecate the use of douches, while he still thought that sprays were harmless.

Mr H. J. BANKS-DAVIS asked whether it had been definitely ascertained that a child with scarlet fever and discharging ears could induce scarlet fever in another child.

With regard to keeping a child in hospital until the discharge had ceased, it might not cease at all. If a mastoid operation had been performed, and the ear was still discharging, should such a patient be taken into hospital? In the Civil Service, a person with a discharging ear would not be accepted, but if he had a mastoid done and the ear was discharging, he was regarded as partly cured. But he thought such a patient was in the same position as the other.

Mr SYDNEY SCOTT said that the carrier question was a very important one, and asked if it could be shown that a child with a discharging ear was necessarily a carrier of scarlet fever or measles?

Dr J. S. FRASER said that Dr Ker of Edinburgh, stated that he got "return" cases of scarlet fever from houses to which a child with running ears had been sent from the fever hospital.

Mr F. B. GILHESPY said that, at Birmingham Fever Hospital, cases were

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not allowed to go out with running ears. In the last year four patients with discharge had been allowed to go out, but they were cases from which tonsils and adenoids had been removed and the mastoid operation done. Those cases were removed from the hospital at the wish of the parents. Otherwise cases with running ears were kept in as they were regarded as infective. At the Birmingham Ear Hospital three or four years ago there were epidemics of scarlet fever, and it was thought they could be traced to children who had been brought into hospital for either mastoid operation or for treatment of running ears. The Medical Committee had passed a resolution that cases with running ears caused by scarlet fever should not be received for treatment at the ordinary hospital.

He was interested in ozæna and he was watching cases, but they would have to be followed up after they had left the hospital.

Dr HARTOG agreed that it was very difficult to diagnose mastoiditis in scarlet fever before the tissues behind the ear were swollen. He was afraid of scarlet fever complications in the ear, as he had had a bad experience of them. He had seen several cases in which the mastoiditis could not be diagnosed and in which he operated and found softening of the whole bone to such an extent that after clearing up sequestra, dead bone, etc., there remained nothing more than egg-shell bone of the mastoid, and every complication was to be feared. Therefore an early diagnosis was very important. To this end he recommended the taking of stereoscopic radiograms of the mastoid, which plainly showed the sequestra lying in the bone.

Mr A. D. SHARP (Leeds) said he found douching of the nose excellent in practice, though some might have objection to it on theoretical grounds. The risks of inducing middle-ear infection by using the douche he characterised as a bogey. Eighteen months ago he was asked to visit a preparatory school in which there was an epidemic of measles and influenza, with ear complications. One boy had died from septic meningitis, there were two patients with swelling behind the ear, several with bulging membranes, and ten or fifteen with red membranes. In two the usual mastoid operation was done, the bulging membranes were incised and all were put on to nasal douching, with reasonable precautions. He had found that to be of the greatest benefit. There were no further ear complications, and within forty-eight hours there was no further cause for anxiety. Until the condition of the nasal mucous membranes had been improved there would be no improvement in that of the Eustachian tube. After douching in these cases there was a decided improvement in forty-eight hours. Many had enlarged tonsils, probably adenoids. Nasal douching gave rapid relief, so that the tonsil and adenoid operation could be safely postponed until the patient was convalescent. He had never had a case of middle-ear infection as a result of douching. The spray was quite useless. During the douching the patient sat up, with the head bent forward ; few children were too ill to be propped up for a few minutes.

Mr F. SYDENHAM said he did not think there was any evidence of scarlatinal infection from a chronic otorrhœa ; and if an appeal were to be made to the public for the appointment of otologists to fever hospitals there

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must be some solid ground for the request. He had been asked for proof of this infectivity, and he had to confess there was none. But otologists did know, and could prove, the damage done to the hearing apparatus, and the Government could be impressed with the importance of making such appointments so as to conserve the hearing.

Mr J. F. O'MALLEY said that for some time he had filled the position of consulting otologist to a community in north-west London, and a rather advanced experiment was made there. In previous years the establishment had been used as an isolation hospital, and later was partly used as such and partly for the treatment of ear, nose, and throat troubles in connection with the exanthemata. Owing to economical and political reasons, a change was made, and he ceased his connection. But, as a result of his experience there, he concluded that scarlet fever and measles were a serious cause of ear troubles. He was not called upon to treat many cases of mastoiditis, but that was chiefly because the medical officer did a simple incision, and many of the cases healed up. Several hundreds of cases of tonsils and adenoids passed through his hands, but he had only six to eight mastoid cases in a year.

Mr Hugh Jones, himself and others had been trying to bring this matter before the authorities, and one of the results was the appointment of Mr Layton and others to such posts: he hoped it would be extended.

Mr T. B. LAYTON (in reply) referred to a paper by Dr Goodall giving statistics, but these were based on reports by nurses as to discharge from the external ear, and he thought Mr Adam's statistics of 80 per cent. dry were based on the same kind of observation. He (Mr Layton) refused to consider such statistics; none should be accepted unless they were the result of examination by the otologist with the forehead mirror. Only thus could the number who went out with the ears healed be ascertained. Even then, in some cases, it was difficult to say that there was no active disease present; and if none could be detected, there was a weakened mucous membrane, which might be infected shortly afterwards. Some might first be attacked with ear disease as soon as they left the hospital.

The important point had been raised as to whether an operation on a child with running ears ought to be undertaken not for the benefit of the child, but for the benefit of somebody else. Yet no one could say all those cases might cause scarlet fever, and in any individual case it might be the nose rather than the ear that caused the return case. Until more was known of the bacteriology of scarlet fever, the problem would not be solved. A number of parents would refuse the suggested operation; what ought to be done then? He was not prepared to support Dr Kerr Love and Sir William Milligan in their contention that no authority was entitled to dismiss a child unless the ear was dry.

He quite agreed with Dr Kerr Love that the school authorities might refuse to have those cases back at school. Even if it meant the loss of a year's schooling, he did not think it would matter very much. It was for the parents to decide whether they would have an operation done, or whether the child should remain from school until the ear was dry. He thought a good number would heal up as a result of general healthy surroundings. A certain number of the cases healed up after Wilde's

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incision. His difficulty had been to decide at what stage, healing having failed, a mastoid operation should be done. Mr Cheatle had told him that if hot fomentations were put on the ears, as much good was done by that as by Wilde's incision, but he did not think this was so.

He was indebted to Dr Hartog for disagreeing with him, as it would make him carefully reconsider his views as to the relation of scarlet fever mastoiditis to meningitis. After what Dr Hartog had said about stereoscopic skiagrams, he would also consider the question of advising the Metropolitan Asylums Board to instal a stereoscopic X-ray apparatus at one or more of their hospitals.

(*Note.*—The cases shown at the Meeting will be reported in January, 1925.)

REVIEWS OF BOOKS

Körperstellung. Professor R. MAGNUS. Pp. 740. Price $6.45 Berlin: Julius Springer.

This publication forms the sixth volume of a series of monographs on the physiology of plants and animals. It represents the result of the recent work at Utrecht on the "neck" and "otolithic" reflexes with special reference, as its name implies, to "body posture."

From one point of view it is a reproduction of the various articles which have been published on the subject associated with the names of Professor Magnus and Dr de Kleijn, and with the Pharmacological Institute of the University of Utrecht. All the material has now been arranged in its proper sequence for the benefit of the student, covering, as it does, the whole of the experimental work in this direction, and leading up, step by step, to the valuable knowledge resulting therefrom.

The origin of this particular research, the author states, was dependent on the reactions which he noted during March 1909 in a decerebrated cat, in which, after division of the spinal cord in the thoracic region, rigidity of the forelegs was observed on turning the animal from the lateral to the dorsal position. The systematic investigation of these reactions resulted in the fascinating voyage of discovery towards the determination of the influences which control the static sense and the formulation of laws governing the "posture" reflexes.

The volume is arranged in twelve chapters. Chapter I. gives a general view of the whole subject; the balance of the body and the effect thereon of various experimental operative procedures on the nervous system; a survey of the "neck" and the "labyrinth" reflexes on the tonus of the limbs and the effect of the same agencies on the position of the eyes, etc., etc. To sum up, it outlines the observations,

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