SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY

June 10, 11, 1927.

President—DAN MCKENZIE, M.D.

(*Continued from* p. 848, vol. xlii., 1927.)

Demonstration of Radiograms of the Normal and Abnormal Labyrinth—H. GRAHAM HODGSON, M.B.—The paper is published in the *Journal of Laryngology and Otology*, vol. xliii., p. 92, February 1928.

DISCUSSION.

MR F. W. WATKYN-THOMAS said he had two remarks to make before saying anything else: first he must pay a tribute, not to Dr Graham Hodgson's technical skill—the work he had shown spoke for that—but to his untiring energy and enthusiasm; secondly, neither he, nor Mr Jenkins, who introduced his paper with him, were in any way responsible for, or, perhaps he should say, guilty of complicity in, his (the speaker's) conclusions.

As the majority of the cases on which he had been working with Dr Graham Hodgson were cases of clinical otosclerosis, he (the speaker) would confine his remarks to that condition.

By "clinical otosclerosis" he meant cases in which there was an intact membrane, a patent Eustachian tube, a Rinné negative at 512 d.v. or higher, paracusis of Willis and a negative Gellé. In all his cases except one there was a lowering of the high tone limit by air as tested by monochord and Galton-Edelmann whistle.

In all there was a curious uniformity in radiological changes, a uniformity strangely at variance with the protean clinical manifestations. If these photographs were viewed from a distance of six feet or so it would be seen that in the otosclerotics the labyrinth stood out as a compact lump; the changes were not confined to one part of the labyrinth but affected the labyrinth capsule as a whole. He emphasised "labyrinth capsule" because, however much he had suspected it, in no case had he proved, to his own satisfaction, any encroachment on the labyrinth lumen. The change, which could best be described as a "fuzziness" or swelling of the labyrinth wall, was specially marked in the region of the superior vertical canal and about the first turn of the cochlea; such changes in the region of the first turn—again without any narrowing of the lumen—were shown in one of the plates in Wittmaack's "Histological Study of Otosclerosis." Changes in the region of the internal auditory meatus were frequent, and here it appeared to him that, in some cases, there was a narrowing of the lumen.

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An interesting point was the disparity between the clinical and radiological findings; for instance, in one case of his the bone changes were much more advanced in the right ear than the left, but clinical examination showed that the left ear was deaf to the conversational voice at 8 in., while with the right ear the patient could hear at 18 ft. In another case, clinically unilateral, on the affected side there was nearly complete deafness to the conversational voice, but the high-tone limit on that side was normal for air and bone, although there was considerable change in the region of the first turn. This case was of particular interest when one recalled the fact that, on the resonance hypothesis, the first turn was the part of the cochlea responsible for the acceptance of the high notes.

Another point of interest was that the bony change was confined to the labyrinth and followed the line of the capsule; there was no diffusion into the surrounding petrous, except at one spot, namely, the angle between the superior canal and the free border of the petrous; in many of these skiagrams an extension of the bone change could be seen in this region.

A third point was that, in none of these skiagrams of otosclerotic patients was there any evidence of true sclerosis. The labyrinth capsule was thickened and expanded, but, if new bone had been laid down, it would appear to be spongy bone, not compact.

At this stage it would be premature to attempt any deductions; much more work must be done, and radiological and histological findings must be correlated in a series of cases. It might, however, be justifiable to hazard two suggestions; neither was original. Manassez regarded the nerve deafness of otosclerosis as the primary lesion; the bone changes as secondary. If, as these skiagrams suggested, otosclerosis was a disease of the whole of the labyrinth capsule, it was easy to see how, in the irregular spread of the disease, any nerve fibre group might be picked out.

Again, it must be admitted that there was one hypothesis as to the pathogenesis of otosclerosis which certainly did fit in with the radiological findings. The labyrinth was in the petrous, but not of it. The labyrinth developed independently, and its capsule was formed in two layers, a layer from the mesoderm around the primitive auditory capsule, and an outer layer from the mucoperiosteum of the tympanic cavity and from the dura mater. Between these two layers there was, in the fœtus, a lymphatic space, and the suggestion had been made that otosclerosis was due to an infection of this space, which had not been perfectly obliterated.

Mr ALEX. R. TWEEDIE said that Mr Watkyn-Thomas had referred to the high tone limit for bone conduction on one side, and he (the speaker) would point out that as we had no noise apparatus for obliterating this function in one ear, it was impossible to decide accurately by which ear bone-conduction of the high-tone limit was really heard. He himself was endeavouring to have a noise apparatus made, which would exclude the appreciation for the high tones on one side.

Mr G. J. JENKINS said that for many years he (the speaker) had tried to induce radiologists to take up this subject. Dr Hodgson had responded well and great credit was due to him for what he had done.

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Societies' Proceedings

November 6, 1927.

President—J. S. FRASER, F.R.C.S.E.

National Investigation of Otosclerosis—J. S. FRASER, F.R.C.S.E.—The address is published in the *Journal of Laryngology and Otology*, vol. xliii., p. 84, February 1928.

DISCUSSION.

Dr J. KERR LOVE said it was difficult to know how to approach this subject, but investigation ought to be attempted. The proposed inquiry might begin by being too broad. Those who thought otosclerosis and congenital deafness might be associated should begin by considering how a condition which was completed at birth might be associated with one which did not begin till the twentieth or even the thirtieth year. If both forms could be included in the inquiry, light might be thrown on each. He felt certain that an independent inquiry instituted in this country, and associated with Mr Fraser, would not fall short of that undertaken in America.

Sir WILLIAM MILLIGAN said he warmly sympathised with the project, but these schemes were apt to come to nothing because interest evaporated after a year or two. Very few people died from otosclerosis, but many died with other lesions in addition to otosclerosis. It would be of value if house-surgeons would make a point of reporting cases in which the patients, in addition to other lesions, had some form of deafness. A monetary gift, not a large sum, might be offered as an additional inducement and a slight recompense for their trouble. The sum of £5 might be offered for a report and for a pathological specimen. He did not see why some of the Norman Gamble Fund and that provided by Lady Dalby should not be devoted to this object. He agreed that the inquiry should not be on a very broad basis; a certain number of hospitals, having large numbers of patients, should be selected as likely to provide the desirable material.

Sir JAMES DUNDAS-GRANT said that many years ago, when he first had cases of otosclerosis, he had been keenly disappointed that he could do nothing to remedy the deafness from this cause. What he then found did most good for the cases was the administration of the compound decoction of aloes, which amounted to saying that there had been toxins present, and that they had to be cleared away. In any case this did more good than continuous inflation.

With regard to the association with parturition, changes were found by Ducrest in the skulls of women who had died in child-bed, and it was pointed out that there were little changes in the interior surface of the skull; and there seemed to be an association of blood changes with bone changes like those of osteomalacia. That made one consider also the glands, especially the parathyroid. In a few of his cases there was a diminution of calcium content, in one to an extraordinary extent.

With reference to an association with osteo-arthritis, there was a good deal of resemblance between the lesions of the two conditions. He once

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asked a house surgeon to see if his osteo-arthritis cases were deaf, and he said they were not. However, the speaker himself went over them with the tuning-fork, and found that nearly all of them gave Rinné negative.

He agreed that what was wanted was *post-mortem* examination of these cases.

He suggested that the national investigation recommended should be inaugurated by this Section.

Mr HERBERT TILLEY said that since the Edinburgh discussion on this subject he had been making inquiries at the hospital to which he was attached, and as a result he thought help might be given by a well-known biochemist at University College. He felt sure that otologists working alone would never discover the cause of otosclerosis. Also in the new Royal Ear Hospital, University College, there was an admirable silence chamber, probably the best in the world, and he did not doubt that it would be at the disposal of those who desired to test their cases under constant conditions.

There was a good deal to be said for Sir William Milligan's suggestion that some sort of reward should be offered to indirect workers. In his own hospital there would be no difficulty in asking all the resident house physicians and surgeons to notify every case of deafness in the hospital and in getting the Registrar of the Royal Ear Hospital to collect these cases and have them examined by members of the Royal Ear Hospital Staff. Mr Scott had referred to the question of appointing a registrar for the purpose, but he (the speaker) thought there should be many registrars from the different centres co-operating in this work.

Mr J. F. O'MALLEY said he was anxious to see such a programme carried out. Those who had considered the subject had found that the number of cases of otosclerosis was greater than they had thought: also that the available range of treatment offered little hope. The limitations of the investigation would be considerable, and unless help was forthcoming much progress could not be expected. He hoped the idea would be supported by the whole Section.

Mr NORMAN BARNETT thought the best material for the inquiry would be obtained from Union infirmaries as there the patients did not drift from one hospital to another.

The surgeon in one well-known infirmary had promised to secure post-mortem the temporal bones of all patients who had suffered from deafness.

Chronic Suppurative Otitis Media on the Right (*i.e.*, the exposed) Side of Motor Drivers (three cases)—R. J. CANN, L.R.C.P., M.R.C.S. (introduced by Mr T. B. LAYTON).—(1) Male, aged 20, a garage motor driver attended in November 1925, with right-sided chronic suppurative otitis media. History of a mastoid operation in 1917; attended intermittently for several weeks. He appeared again in December 1926, with pain in right ear and a history of giddy attacks, making it impossible for him to continue driving.

13th December 1926. — Right radical mastoid operation was performed; in February 1927 he was at work as motor driver.

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(2) A private chauffeur, aged 28, had chronic suppurative otitis media on the right side for years; attended out-patients, August 1926, because of several giddy attacks, one of which occurred while driving and nearly resulted in an accident.

9th August 1926.—Right radical mastoid operation was performed.

In November 1926—At work and well since.

(3) L.C.C. ambulance driver, aged 33, whose right ear began to "run" in 1915 while in France; time-serving man, discharged medically unfit in 1919 for this. Granted pension for two years, when this was stopped, as he was told the ear was cured. Lorry driving 1919-24, when he joined London Fire Brigade (Ambulance Section) as an ambulance driver.

December 1926.—Pain in right ear, followed by deafness and giddiness. Admitted to St Giles' Hospital 2nd February 1927, and immediate operation performed. Subsequent operations 9th February and 23rd May. Returned to duty end of August. A fortnight ago had giddy attack while cleaning ambulance and fell out of the back door. As a result of this he is marked for discharge from the service.

It is curious that these three patients should all have the complaint on the same side, and I have wondered whether there was any connection between this fact and the motor driving.

Mr NORMAN BARNETT said that few modern cars were not equipped with windscreens, and he thought the fact of the right ear being affected was merely a coincidence.

Mr T. B. LAYTON agreed.

Mr J. S. FRASER (President) said that a draught was more liable to cause an internal ear affection than to cause a lesion of the middle-ear. A "cold," *i.e.*, an acute catarrhal rhinitis, sometimes produced middle-ear inflammation. But a cold wind blowing on the ear was more likely to cause facial paralysis or nerve deafness. He had had a few patients suffering from nerve deafness, even in one case of herpes zoster oticus apparently due to a cold wind impinging on one side of the face. With regard to chronic middle-ear suppuration that trouble usually began very early in life, and went on possibly unnoticed by the patient. It was uncommon for chronic middle-ear suppuration to begin when the patient reached the age at which he could be a motor driver.

Attic Cholesteatoma, Vertigo, Ossiculectomy, Recovery—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—A young man who had suffered from suppuration in the ear since childhood, was first seen by me on 15th September 1926, complaining of headache and especially of giddiness: he had been in bed for six weeks with vomiting and vertigo. He had a large opening in the attic filled with white cholesteatomatous masses. After cleaning out and the use of salicylic acid and alcohol, the giddiness disappeared. The discharge continued and re-accumulations took place, requiring occasional clearance. In May 1927, I removed the ossicles and from then he was free from

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disturbance and the discharge became very slight. In October he had a recurrence of headache, the meatus being blocked by a soft polypus; I removed this and he became quite comfortable. The removal of the polypus seemed so complete that I could not find its site of origin. The hearing is better than it was before removal of the ossicles.

Mr A. R. TWEEDIE said that the large cholesteatomatous mass, described as occupying the attic, seemed to indicate the absence of the incus. Was this the case, and if so, what ossicles were removed? He noted that the meatus was still filled with granulations, and suggested that further operation would now be required.

Dr J. KERR LOVE said that ossiculectomy was not suitable in this case. At this stage the word "cure" was not applicable. In a case of his own the patient had refused to undergo the mastoid operation. From time to time there had been retention of pus in the attic. He (the speaker) removed the incus, which was dead, and in doing so he had disturbed the stapes, so that the patient had considerable giddiness. Later the malleus was removed, and there was no evidence that the tympanic antrum was involved. The previous week the patient had left for Morocco, and his ear was quite dry. It was difficult to distinguish a case in which only the attic was involved from one in which there was more extensive mischief. If other local measures did not succeed a radical operation ought to be performed.

Sir JAMES DUNDAS-GRANT replied that a portion of the incus might be present, and possibly the head of the malleus, but he removed the remainder of the chain of bones. If he had to do the mastoid operation, then he would be certain. After the removal of the cholesteatomatous masses the patient completely recovered from the vertigo and headache. This was exactly the kind of case in which ossiculectomy was called for, as there was a mechanical barrier to the escape of the cholesteatomatous formations. The main object in making a large opening was to admit air and allow the products to escape. It was best to remove the ossicles in the first instance, and if that operation produced the desired effect well and good. If not, one should proceed to the radical mastoid operation.

Squamous-celled Carcinoma of Left External Auditory Meatus—T. B. JOBSON, M.D.—Female, seen first by Mr McLaggan on 15th August 1927. History was obtained of something obstructing the ear for some months; pain for one week; meatus blocked by masses which looked like polypi, pus and debris. Growth is attached to posterior wall about half an inch from pinna. Portion of growth removed.

Pathologist's Report.—"Squamous-celled carcinoma."

22nd September 1927.—Radium needle inserted.

27th October 1927.—Marked improvement, no pain. Growth about one-quarter its original size.

Sir WILLIAM MILLIGAN said the result achieved was remarkable, though he was not sure that there was not a slight recurrence. It was

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extraordinary how rapidly radium could be effective. He asked how Mr Jobson applied the radium? If by a needle, what was the dose? Spicules could be introduced into such a growth and left imbedded. The result of the treatment in this case was remarkably different from his own experiences in cases of carcinoma of the external ear.

Mr H. J. BANKS-DAVIS asked whether, in this case, there was any discharge from the middle ear, as the outlook was very serious if that was involved. He had shown three cases of the kind before the Section, and in all there had been recurrences.

Dr T. RITCHIE RODGER said he had had two cases of squamous-celled carcinoma of the external ear. Dr Jobson would be well advised to remove the posterior wall of the meatus through a mastoid incision, with the adjacent part of the mastoid process as well. He (the speaker) had done that in a case eight years ago, and the patient was still alive. After the mastoid exposure he had used radium in the packing. He had at first feared atresia of the canal, but three months later the canal was patent, and he had recently heard that the patient was well and the hearing normal.

In his second case the condition was further advanced, and the results were not so good; the post-meatal cells of the mastoid were invaded, and facial paralysis, with extension into the middle ear, took place, and was followed by the death of the patient. In the present case there should be a good result from the suggested mastoid exposure, making as wide a sweep as possible. If cases of the kind could be seen early by the otologist the prognosis need not be a gloomy one.

Mr J. D. MCLAGGAN said he had seen this case before radium was applied, and at that stage there was a small soft gland below the tip of the mastoid, which might have been inflammatory. He could not now palpate that gland, but there seemed to be a slight resistance beneath the sterno-mastoid, and it might be well to supplement the radium application by an extensive dissection of the neighbouring glands.

Mr FORSTER said that in a case of the kind, in a middle-aged woman, he had proceeded partly as in Mr Ritchie Rodger's case, but his (the speaker's) had been a more advanced case, and so he had decided to perform a radical mastoid operation, largely to allow freedom for the growth if it recurred, and to give the patient longer postponement of the pain. He had followed the growth to the tympanic membrane which it had not invaded. Nevertheless, the radical operation was done. There was a recurrence; radium was inserted, without success—severe pain had set in and the patient died. He had since seen one or two advanced cases in older patients, and he had not attempted operation. Sir William Milligan had suggested diathermy in such cases.

Dr W. S. SYME said that the best result he had had in a case of the kind was one in which he had removed the pinna, and extended the incision downwards, clearing out the region below the ear.

Dr JOBSON (in reply) said that he had not previously seen a case in which the disease was strictly confined to the meatus. The lesion was a quarter of an inch from the outside of the canal. He felt much indebted to Mr McLaggan as he had made a very quick diagnosis. At first the condition had seemed like chronic suppurative otitis media with

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cholesteatoma, followed by blocking of the external auditory meatus. It was suspiciously hard.

He had heard of a similar condition diagnosed by a London surgeon as furunculosis, and treated as such for some months. Afterwards, when it was found to be malignant, operation was performed. The growth was found to have spread to the dura mater and the patient died.

The dose of radium used was 30 mgm. of emanation, applied for six hours; the application was carried out at the Radium Institute, and a special needle was made for the case, so that it could be thoroughly buried in the growth. Three weeks after the radium application there was a discharge from the ear, and pain, but during the last ten days there had been neither discharge nor pain. The thickening of the gland might have been due to septic absorption; he could not feel any tender enlargement there now. The effect of the radium had been magical. A week ago there had been a tumour the size of a pea, and now there was only a little excrescence from the posterior wall. Further treatment would be given.

Skiagrams of the Petrous Bone—Dr GOALWIN (New York).

Mr FOSTER understood that the examinations of the petrous pyramid had been recently made by the Stenhuis method in cases of Gradenigo's syndrome; changes at the apex of the petrous had also been demonstrated.

Mr J. S. FRASER (President) said that a method recently used in Edinburgh for X-raying the sphenoidal sinus had given good results as regards the petrous bone and labyrinths. The patient lay on his back with his head extended over the end of the table. The X-ray tube was placed over the chin, and the plate beneath the vertex. This method enabled one to see the septum nasi, the sphenoidal sinuses, the petrous temporal bones, the mastoid processes, the foramen magnum and odontoid process. In a good plate one could pick out the details of both labyrinths and see the erosion of the petrous bone in a case of tumour of the 8th nerve. He recommended this method not only for investigations in cases of suspected sphenoidal sinus suppuration, but also for getting a good picture of both petrous bones.

ROYAL SOCIETY OF MEDICINE—SECTION OF LARYNGOLOGY.

President—Mr H. S. BARWELL, F.R.C.S.

November 4, 1927.

Laryngofissure for Intrinsic Carcinoma of the Larynx: four cases in medical men, who are now in active practice, 2¼, 3, 4½, and 5½ years after operation.—Sir ST CLAIR THOMSON, M.D. CASE I.—This case is interesting in view of the comparatively early age of the patient and some difficulty in diagnosis. Male, aged 40, was referred to me on 28th March 1922 by Dr Arnold Jones. Ten weeks previously he had a sudden attack of

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hoarseness, and was reported then to have general laryngeal catarrh, which subsided slowly, leaving a lesion of the right cord. The right cord, except both extremities, was invaded by an irregular, mammillated growth, with necrotic, white, ulcerating points over the centre. The cord moved freely. No history of lues; no signs of pulmonary, vascular, or renal disease.

Efforts to remove a portion, under cocain, were not successful, as the reflexes could not be controlled. Two months' voice rest improved the voice, but local irregularity and ulceration slightly increased. I urged operation although clinical diagnosis of epithelioma was unsupported by a biopsy; I explained that, while a piece could be removed under general anæsthesia, and examination might confirm the diagnosis, yet a negative report would not alter my opinion and might lead to disastrous delay, and possibly stimulate diffusion of the growth.

19th May 1922.—Usual laryngofissure was performed.

Chloroform 13 drachms, and oxygen 40 gallons were used as anæsthetic.

A considerable portion of the right thyroid ala was removed. The tracheotomy tube was removed on the evening of operation; he could then swallow. Five days later he went for a walk; the neck wound closed ten days after the operation; he left the home within the fortnight.

Dr C. Fletcher reported the growth to be a typical squamous-celled carcinoma, penetrating the submucous tissue to the level of the small muscles. The excision appeared complete in all directions.

Five and a half years after operation he is in good health and able to carry on a large practice.

Case II.—A medical man, aged 52, had been hoarse for two months when he was sent to me by Dr N. E. Kerr, of Sheffield, on 4th April 1923.

The right cord presented a characteristic, cupped, grey infiltration of the anterior half, while the rest of the cord, backwards to the vocal process, showed a red, beefy, infiltration. The cord moved well. Sputum examination: no tubercle bacilli. No biopsy. Wassermann reaction negative.

12th April 1923.—Usual laryngofissure was performed.

Thyroid ala removed; tracheotomy tube was not left in. Patient was out of bed next day. Neck wound closed twenty days later.

Dr C. Fletcher reported: "Typical squamous epithelioma, with a margin of uninvaded tissue in all directions."

Four and a half years after operation the patient continues to carry on his general practice single-handed.

Case III.—A medical man, aged 56, was referred by Mr Musgrave Woodman on 10th October 1924.

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Husky for six months; there is an irregular, knobby, whitish, slightly cupped, abraided thickening of the anterior half of the right cord, which moved well; tuberculosis and syphilis negative. Voice rest and observation for two months, during which time the appearances became more marked and the movement of the anterior half of cord began to flag.

13th December 1924.—Usual laryngofissure and right ala removed; little bleeding; tracheotomy tube left *in situ*.

At 4 P.M. I was sent for on account of hæmorrhage. Large hæmatoma under the stitches, outside trachea and larynx. It was found that the tube had slipped out of the windpipe. (The tube had evidently been left too short, as often happens when the patient's head and neck are no longer extended in the tracheotomy position and the trachea sinks deeper in the neck when he is returned to bed in the sitting position, with head flexed. Hence the value of a "Jumbo" tracheotomy tube.) The cannula was replaced, with packing to check venous bleeding. This gave no more trouble. The patient was out of bed next day and he returned home twelve days after his operation.

Pathologist's Report.—"Squamous-celled carcinoma, with a generous margin of uninvaded tissue in all directions."

Three years have passed. The patient smokes two to three pipes daily. His health is excellent. Two years ago he reported that his voice was strong, though rough, and that he often saw thirty patients daily.

CASE IV.—A medical man, aged 62, had been husky for ten months before he consulted Dr Gavin Young (Glasgow) for a growth at the junction of the anterior and middle thirds of the right cord. A portion was at once removed by Dr Young by the indirect method, and the report on it was: "Although there is no evidence of marked infiltration in what is available for examination, the papilloma is to be regarded as showing changes which are definitely epitheliomatous in character."

I found the cord, with the exception of each extremity, occupied by a whitish, moist, irregular, apparently superficial papilloma-like infiltration. The cord moved freely.

10th July 1925.—Usual laryngofissure performed and thyroid ala removed.

Chloroform 3 drachms, ether 4 oz., oxygen 40 gallons were used as the anæsthetic.

Tracheotomy tube was left *in situ* for eight hours. Patient was up next day and out for a walk on third day. The neck wound closed within the week, and he returned to Scotland on the eleventh day after the operation.

Dr H. A. Osborn cut the usual three sections through the anterior, central, and posterior positions of the removed mass and reported:

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"The classical features of a squamous-celled carcinoma, extending through the corium to the muscle layer, but with a fair margin of uninvaded tissue in all directions."

Dr Gavin Young reported (summer 1927) "condition perfect, voice quite good, carries on an active practice."

It is two years and four months since the operation.

Attention may be called to the following points:—

Clinical Features.—The lesion was limited in all cases to the cord, and did not invade the subglottic area or the anterior commissure. The anterior half of the cord was invaded in all cases, in some entirely and in all chiefly. No impairment of mobility was present.

Diagnosis.—Apart from naked-eye appearances and general considerations, the diagnosis was confirmed by the exclusion of tuberculosis and syphilis, and the results of voice rest and observation—two months in two cases.

Biopsy.—Carried out in one case.

Operation.—This occupied fifty to sixty minutes; but as much as fifty-two minutes (Case I.) have been occupied in arresting hæmorrhage before the patient was removed from the table.

Thyroid Ala.—Removed in all cases, allowing a free approach, more perfect excision, and better control of bleeding. Quicker healing: no stenosis. A further justification is the pathologist's demonstration that the growth, even in the limited and favourable cases, extends deeply into the muscular tissue.

Tracheotomy.—Performed in all cases, thus securing complete protection against descent of blood, mucous and septic material into the bronchi and facilitating a light, smooth and satisfactory anæsthesia.

Tracheotomy Tube.—In one case removed at the termination of the operation; in the others left in place till the same evening (*i.e.*, seven to eight hours).

Bleeding.—Guarded against by careful pre-operative precautions—abstinence from alcohol and tobacco; careful diet; forty-eight hours' rest in bed beforehand; smooth anæsthesia and intratracheal and intralaryngeal injection of cocain.

Post-operative Hæmorrhage.—This occurred in one case and the source was *outside* the laryngo-trachea. This emphasises the importance of arresting all venous and thyroid gland oozing before opening the trachea.

Convalescence.—No shock: Wide-open windows night and day. Sitting posture: Up in twenty-four hours; out in three to four days; and in no case more than three weeks in the home.

Simplifications.—No alkaloid (morphia, atropine, heroin, etc.) at any time. No intratracheal packing or applications (*e.g.*, cautery, Whitehead's varnish, antiseptic powders, diathermy, etc.). No artificial feeding.

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Results.—Rapid recovery: Good general health, generally improved by increased attention to rules of hygiene and avoidance of fatigue and vitiated air. A voice generally as good as before operation and sufficient to carry on satisfactorily the duties of medical practice: Lasting cure.

I agree with Mr Colledge's statement in his Semon lecture that the cases suitable for laryngofissure are those with a growth limited to a mobile cord and with no subglottic infiltration. When the cord is fixed or the case is subglottic it is on the borderline, but even then (as I have shown) susceptible of lasting cure by laryngofissure.

Whether one should give the patient the benefit of laryngofissure, and be prepared to do a laryngectomy if found necessary, or whether one should at once proceed to a laryngectomy, is a question. If the growth has crossed the anterior commissure or invaded the arytænoid, then laryngectomy is the only safe course.

Case of Complete Laryngectomy and Case of Lateral Pharyngotomy for Epithelioma of the Epiglottis.—LIONEL COLLEDGE, F.R.C.S.

Dr P. WATSON-WILLIAMS said that it was unique in the history of the Section for one member to produce four colleagues on whom he had successfully operated. It was noteworthy that Sir St Clair stressed the desirability of going not only up to the anterior commissure of the involved vocal cord, but even beyond it. In a case referred to by Sir St Clair with which he (the speaker) was associated, the patient, a chronic alcoholic, had appeared to be a poor subject for operation, and though there had been no recurrence of the malignant disease, it was not surprising that he subsequently succumbed to some other condition. He agreed that cases of subglottic growth presented great difficulty, when it, the growth, was found to extend downwards considerably. It was not easy to determine whether one ought to do simple laryngofissure, or proceed to laryngectomy, or at least hemilaryngectomy. What was Sir St Clair Thomson's opinion of hemilaryngectomy when it appeared probable that this might suffice so as to avoid the necessity of the more severe complete operation? When was it too risky to do only laryngofissure, involving removal of one thyroid ala? Was the ultimate condition of the patient more satisfactory than in cases where complete laryngectomy had been performed?

Dr RUSS WOOD asked whether Sir St Clair Thomson had had experience of cases in which there had been no local recurrence of the disease, but in which the patients had died four or five years afterwards from malignant disease in other parts of the body. He (the speaker) had had two such cases, the disease in other parts becoming manifest five years and four years respectively after the throat trouble. No post-mortem examination had been made in either case.

Mr HERBERT TILLEY said that in one of his own cases in which ordinary laryngofissure was performed for a localised growth on a vocal cord, a small nodule had appeared in the scar of the skin incision fifteen years afterwards. That was freely removed, but a further nodule had

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appeared some five months later, and eventually the skin of the whole front of the neck became infiltrated by epithelioma and the patient died. In another case in which he had operated many years ago the patient had carried on his profession as a solicitor for nineteen years afterwards. Then he had increasing stridor and it was found that the growth had recurred in the larynx. At the same time he was suffering from a malignant growth in the prostate. These cases illustrated the long periods before local recurrence takes place, and seemed to lend support to the dictum of one of his old teachers, viz., "once cancer, always cancer."

Mr J. F. O'MALLEY asked what were Sir St Clair's reasons for deciding, in his later cases, to remove the ala of the thyroid.

Mr LIONEL COLLEDGE said he did not think much could be advanced in favour of formal hemilaryngectomy, because if half the larynx was removed, a skin flap must be turned in to replace the epithelial lining on that side; then the remaining half tilted over, the skin flap collapsed against the opposite side, and his experience had been that the function of the half of the larynx left was very poor. The patients wore a tracheotomy tube, and though they had a stronger voice they were really in little better position than if they had had complete removal of the larynx. If following laryngofissure any further operation short of total laryngectomy was required, it would not be a formal procedure, but a partial excision, such as taking off the whole front of the larynx completely. As soon as the ring of the cricoid was damaged there was so much stenosis that he did not think hemilaryngectomy was satisfactory.

Sir ST CLAIR THOMSON (in reply) said that in two of his cases of laryngofissure there had been recurrence, and he had handed them over to Mr Wilfred Trotter, who had performed hemilaryngectomy, turning in a skin flap. Both the patients had been obliged to wear a tracheotomy tube permanently, but they had retained a voice. One of these patients was a working girl, and she was able to continue her occupation. Laryngofissure was a much more frequently fatal operation than complete laryngectomy, but there was a great social advantage in saving, even with tracheotomy, an audible voice.

He also had had cases of recurrence of malignant laryngeal disease in other parts of the body. In one case after a seven years' freedom there was recurrence on the opposite cord. He performed another laryngofissure, and the patient was now free, although the second operation was carried out three and a half years ago. In two cases there had been recurrence in the glands. One patient was alive eight years after operation on the glands. In one case there was no local recurrence, but malignant disease appeared in the mediastinum four years after.

With regard to the question of the removal of the ala, the reason advanced for keeping it was that cartilage formed a better barrier in case of recurrence. In his own view, however, the barrier lay rather in the perichondrium, and when he removed the ala he secured a better view, better control of hæmorrhage, less tendency to subsequent stenosis, and quicker healing. If bare cartilage was left, it was not covered by granulations until months later, whereas after removal of the cartilage, the vascular surface left was quicker in healing.

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He was strongly convinced of the advantage of keeping the tracheotomy tube in for the first seven hours, or the first day; the procedure made for safety.

Mr H. S. BARWELL (President) said that both Mr Colledge's cases showed good results. In the first case there was very useful articulation.

Dr W. SYME asked whether Mr Colledge had experience of subhyoid pharyngotomy in cases of malignant disease of the epiglottis. It seemed an easy method of dealing with this condition in suitable subjects.

Mr COLLEDGE (in reply) said that he showed these two cases as a sort of appendage to Sir St Clair Thomson's series. In answer to Dr Syme, the very large tumour growing from the edge of the epiglottis—a picture of which he had shown at the lecture on the previous day—was removed by subhyoid pharyngotomy, but not intentionally, because the operation was begun with the idea of removing the larynx. When the entrance to the larynx was exposed, it was found that the tumour only grew from the epiglottis, and laryngectomy was not required. He would not perform that operation intentionally; there was better exposure obtained by going through the side and deliberately cutting one superior laryngeal nerve. In that case both superior laryngeal nerves were cut, and he (Mr Colledge) did not see how one could perform subhyoid pharyngotomy with free exposure without cutting them. That patient had trouble in swallowing afterwards, though his death six months later was following appendicitis, without any sign of recurrence. The functional result in the patient exhibited was excellent.

Achalasia of the Cardia after Treatment by Hurst's Mercury Tubes—HERBERT TILLEY, F.R.C.S.—Male, aged 58, a tinsmith, was admitted for "difficulty in keeping food down and vomiting" for eighteen months; the first symptom had increased during the four months before admission, but the vomiting varied in frequency, and sometimes the ejected food was unchanged, at other times its constituents were unrecognisable. Since 1915 the patient had had an uncomfortable feeling in the gullet and a sensation as of a lump in the throat. For eighteen months he had been losing weight and getting very weak.

On admission he looked ill and emaciated, and was very weak. X-ray examination showed "dilatation of the œsophagus above the cardiac sphincter."

On 4th August 1927, I examined the gullet by the direct method and removed with Sorensen's suction tube about half a pint of thick fluid composed of macerated food and mucus. Through the distal end of the dilated gullet a series of graduated bougies was passed through the cardiac orifice.

6th August 1927.—Hurst's mercury tube dilators, Nos. 28 and 32, passed into the stomach without much difficulty. The first was left in for five minutes, and the second for ten minutes. Similar treatment was carried out daily, except that sizes 32 and 34 replaced the smaller

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bougies used on the first two occasions, and on the fourth day of treatment the patient could swallow and retain semi-solid food.

13th August 1927.—Patient can now pass the bougie himself, and he takes practically any food he likes. No vomiting occurred after the first passage of the mercury bougie. The patient has put on 14 lb. in weight since the treatment commenced and looks an entirely different being. At present he passes the bougie once a week. Duration of stay in hospital was eleven days.

Cardiospasm—H. BELL TAWSE, F.R.C.S.—Male, aged 11, had vomiting at the age of 9, occurring when he lay down in bed at night. This, with an occasional exception, has continued ever since, even during sleep. He awakens coughing and then vomits undigested food.

He is apparently healthy and is well nourished. His average food per day is 30 oz. solid and 34 oz. liquid. During eleven days, while in hospital and in bed he vomited on seven occasions, always at night, an average quantity of 8 fluid oz. When at home he vomits oftener. Medical report reveals nothing abnormal.

There is no clinical evidence of a large thymus or of enlarged glands at the hilus. The left pupil is definitely larger than the right, but both react normally to light on accommodation. The Wassermann reaction is negative.

X-ray report: There is obstruction at the lower end of the œsophagus with great dilatation of the whole of the œsophagus above. Appearance suggests that obstruction is due to cardiospasm. Indentation about middle of œsophagus. The mediastinum at this part shows increased density. In the antero-posterior view, a dense shadow extends downwards and to the right from the manubrium sterni to the third interspace, ? due to large thymus. There are numerous calcareous glands at the hilus on both sides and the heart is somewhat narrowed.

Extreme and Diffuse Dilatation of the Œsophagus.—H. BELL TAWSE, F.R.C.S. (case of Dr F. J. POYNTON).—Female, aged 10, first had signs of trouble in swallowing in the second year; worse after bronchitis in the fourth year. Diagnosed then as enlarged thymus. At the age of 7 the attacks of difficulty of swallowing became very severe; there was no stridor, but the child ran about crying for air, and in the worst attacks became quite unconscious and appeared to be dead. These attacks lasted about three minutes; during them thick mucus collected and relief was obtained on vomiting. The case was thought to be a new growth of the œsophagus. The child died after operation for the relief of the condition.

X-ray Examination.—The screen examination reveals equal illumination of both lungs except where the lung field is encroached upon on the right side. The diaphragmatic movement is equally good on both sides. Barium fluid is seen to pass down œsophagus into stomach

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without delay. The œsophagus diverges to the right; the cardiac orifice appearing to the right of the spine. The skiagrams show an abnormal shadow of uniform opacity extending from the first to the twelfth rib, and encroaching into the lung field on the right side. In the oblique view this tumour is seen to be lying posteriorly to the lung. The heart and aorta shadows are quite distinct. There is no evidence of any displacement of the trachea.

From appearance alone the nature of this tumour cannot be interpreted. Taking into consideration the clinical side of the picture the following can be ruled out: Encysted pleurisy or empyema, sarcoma, mediastinal glands, enlarged thymus (also position).

The œsophagus, although displaced, does not appear to be directly connected. The opaque fluid passes directly into stomach.

Benign tumours of the mediastinum are possible, such as fibrous myoma, etc. The defined outline and uniform opacity are very suggestive of encysted fluid.

The appearance is not that of a hydatid cyst. In conclusion it is suggested that the condition is a dermoid cyst growing from the posterior mediastinum.

Remarks.—The X-ray report is given to show the difficulties of interpreting skiagrams.

Œsophagectasia not being suspected, a transthoracic operation was performed and revealed an enormously dilated œsophagus.

Mr W. M. MOLLISON said he had seen two cases of kinks in the middle of the œsophagus. One was in a female patient, aged 30, who had a most remarkable S-shaped kink in the middle of the œsophagus, accompanied by the typical symptoms of achalasia. The other case was the first of the kind he had seen, and he, himself, thought the kink might have been due to adhesions in childhood. Dr Hurst, however, believed it to be a case of achalasia. The patient died of heart failure following operation on the gall-bladder.

Mr E. D. D. DAVIS said he had seen several skiagrams of cases of achalasia showing irregularities similar to those in Mr Mollison's case. He regarded it as an inco-ordination of the whole of the œsophagus in addition to that of the lower end. For more than six years he had observed a man with dilatation of the gullet, for whom he had dilated the cardiac orifice repeatedly. This patient also used the mercury-weighted stomach tube recommended by Hurst. In spite of treatment, the œsophageal dilatation was steadily increasing, as shown by skiagrams taken at intervals of two years. The dilatation and dysphagia increase as the musculature fails with advancing years.

Mr RIDOUT said that one of his patients had two pouches in the œsophagus. When the œsophagoscope was put down it became occluded with fluid, and when it was sucked out it became clear; lower down there was another occlusion.

Mr H. V. FORSTER said he had used Plummer's bougie with success; it gave relief for about a year, after which the patient returned. Had

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Mr Tilley any experience of mechanical dilators of a more rigid, expanding type, such as the Starck? After confirming the diagnosis by the œsophagoscope he, personally, had found it difficult to get the Plummer's bag into the œsophagus when the patient was anæsthetised, and he now preferred to introduce it without a general anæsthetic, first passing it into the stomach and then blowing it out with water, and letting out just as much water as was necessary to allow it to be withdrawn safely. He understood that the orthodox way was to pass it accurately into the middle of the stricture under the guidance of the X-ray screen and then use water to produce dilatation.

Mr ERIC WATSON-WILLIAMS said he had seen a similar kink in a case of his own. On the first occasion, after giving a barium meal one saw the pouch filling up, and from the pouch a thin trickle of bismuth went down one side. He thought there was a stricture half way down the œsophagus, but later found that it was a case of cardiospasm. With regard to the use of the mercury tube, he recently had a case in a man, aged 50, who had been doing well for seven years, and who had passed the tube daily until last spring. He then began to find that after taking the mercury tube out he could not swallow food. He (the speaker) thought the trouble was due to a tightened and irritated cardia, which shut up on the withdrawal of the mercury tube. The patient was relieved by dilatation by means of three gum-elastic bougies; by passing first one, then another alongside it, then a third in between the two, one could tell how much force was being used to stretch the cardia. The patient had since given up using the mercury tube.

Mr TILLEY (in reply) said he had not tried expansible steel instruments passed through the cardia. He lost courage with regard to that form of dilatation when he heard of two cases in which some of the surrounding tissues had been ruptured and the patients had died within two or three days from septic mediastinitis. He had tried the ordinary œsophageal bougies, but not the expansile water bladder. The mercury tube he used was so easy to manipulate that he intended to continue its use until convinced that there was something better. It was less likely to coil up in a bowl-like concavity above the level of the stricture than was the case with an ordinary bougie. With regard to Mr Tawse's patient: Mr Tilley had seen a case which might throw some light on the diagnosis. In that case there had been hoarseness and slight difficulty in swallowing. The hoarseness was due to abductor paralysis of the left vocal cord. By deep pressure between the upper edge of the manubrium and the trachea a smooth, resistant swelling could be felt. Sir James Berry had operated and removed a dermoid cyst. The patient was cured of all symptoms except the hoarseness.

Mr H. S. BARWELL (President) said he did not think the condition in this specimen was achalasia at all, but some more obscure condition, which would perhaps never be determined, as no post-mortem examination had been allowed. The long narrow track of barium passing down in the middle of the shadow was not like what was seen in ordinary achalasia.

Foreign Body in Larynx—M. VLASTO, F.R.C.S.—Female, aged 19, on 10th July while holding an open safety-pin in her mouth, had

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a fit of coughing; the pin disappeared. Patient felt no discomfort, and slept soundly through the night. She ate a good breakfast; later in the day she had a "choky" feeling, and consulted me at the West London Hospital.

X-rays showed the pin in the position indicated in the photo. The point of the pin was upwards and forwards. There was a very slight degree of dysphonia, and it was surmised that the pin was embedded in the larynx. The general condition was good. Under general anæsthesia, laryngoscopy showed the pin to be in the larynx. The upper surface of the safety guard alone was visible, peeping through the rima glottidis. It was assumed that the pointed end was embedded in the tissues below the anterior commissure. Gentle movements of traction and rotation were unavailing to dislodge the pin (the operator does not remember attempting to extract the pin by pushing it into the wider parts below); the operator decided to extract it through an external incision. The patient was moved for the purpose, from the dark room to the main theatre. During the transit, the patient "came round" slightly from the anæsthetic, but not sufficiently to lead one to suppose that the pin had shifted its position. A laryngotomy was first performed, and as the pin was not located, the thyroid cartilage was split; still without success. On further examination with the endoscope, it was found that the pin had slipped down into the right bronchus from which it was removed without difficulty.

Mr H. S. BARWELL (President) said that his first case of foreign body was in a boy, aged 4, and occurred at a time when Brünings' instruments were first introduced into this country. X-rays showed the foreign body to be in the right bronchus, but when the patient was brought to the operating theatre it was found to have shifted into the left bronchus, a fact which caused a good deal of trouble.

Sphenoidal Sinusitis, due to Bacillus Mucosus Capsulatus —HAROLD KISCH, F.R.C.S.—Male, aged 36, complained of intense pain in the right frontal region which began in 1916, and occurred periodically. He had a certain amount of nasal and postnasal catarrh. On examination, there was a grossly deflected nasal septum to the right, and some sticky discharge in the nasopharynx. Otherwise nothing abnormal was discovered. A complete X-ray examination of the nasal sinuses revealed opacity of the right sphenoidal sinus. Owing to the deflected septum it was impossible to lavage the sinus, so a submucous resection was performed. The sinus was then washed out and a culture taken. The anterior wall of the sinus was then opened. He is now quite well and free from pain. The culture showed a pure growth of the *Bacillus mucosus capsulatus*.

Dr PATRICK WATSON-WILLIAMS said there were many points of interest in this case. He did not recall any sphenoidal sinusitis due to this bacillus alone. Furthermore, Mr Kisch had found that the fluid sucked out was

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clear, and was not even suspected of infectivity until submitted to bacteriological examination, proving that it was not only in cases in which there were many polymorphonuclear leucocytes that an infective inflammation might exist and cause intense local symptoms. This man had, between attacks, a distinct loss of memory, inability to concentrate his mind, and an intractable temper; his mentality was so profoundly affected that in his periodic depression he was prepared to end his life. Had he done so, no one would have suspected the cause of the suicide. He (the speaker) was convinced that many cases of suicide were directly determined by sinus infections. The verdict of the coroner's inquest was usually "suicide during temporary insanity," but there was never any post-mortem investigation which might prove that many lives were thus brought to a tragic end from a failure to diagnose in time the sinusitis or other focal infection. It would be well that all branches of the profession should be on the look-out for cases in which mental symptoms were associated with definite sepsis and report them.

Mr JAMES ADAM referred to two cases of the kind which had been under the care of alienists. He asked whether Dr Watson-Williams thought there might not be some relation between psychosis of nasal origin and abscess of frontal lobe.

Dr P. WATSON-WILLIAMS (in reply to Dr Adam) said that he had not had cases of frontal sinus disease associated with cerebral abscess with mental symptoms due to such abscess, but there were cases of sinus disease in which mental symptoms disappeared when the sinus had been dealt with.

Mr KISCH (in reply) said that this patient was a chartered accountant and therefore intelligent, and when seen he was greatly depressed, and had threatened suicide. At first he (Mr Kisch) had thought the case might turn out to be one of sarcoma or carcinoma of the sphenoid, and that was why he had that region X-rayed. No sinus other than the sphenoidal was affected. In his opinion, it was a common occurrence to see different degrees of mental change in nasal sinus disease.

Postcricoid Carcinoma treated by Diathermy with Complete Disappearance of Growth—LESLIE POWELL, M.B.—Female, aged 56, first seen 22nd April 1927. For one year had complained of catarrh of throat. For three months difficulty in swallowing, losing flesh, said she had at night "a little cough and brought up a lot of watery fluid, continuing for about two hours." A large pedunculated tumour, irregular but not ulcerated, was seen obscuring the larynx and extending forward to epiglottis.

28th April 1927. — Diathermy was employed using Davis gag. Growth seen to extend all round lower pharynx and forwards on the right on to the arytæno-epiglottidean fold. Epithelioma.

5th May 1927. — Examination under anæsthetic and further diathermy applied to doubtful spots.

17th June 1927.—Wound healed: patient swallowing well. Has remained well since, and only complains of a little irritation in throat. Has gained 3 lb. Contraction from scarring on right side.

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Mr H. S. BARWELL (President) said he presumed that Dr Powell did not use suspension or the directoscope or other means of obtaining access to the growth.

Mr L. GRAHAM BROWN said he did not think the condition was quite healed. On the right side, in the post-cricoid region, he saw what he took to be a portion of the original growth, or a recurrence.

Dr LESLIE POWELL (in reply) said he thought that the swelling now seen was due to scarring; it had been in that stage four months. He did not use any other form of suspension. When employing diathermy in these cases it was a good plan to make an inspection a week afterwards and to touch doubtful spots again; the patient would submit to this more readily then than later.

Fixation of Left Cord due to Blow on the Neck—W. M. MOLLISON, C.B.E., M.Ch.—Male, aged 37, on 4th October 1927 was cranking a car when the handle swung round and hit the left side of the neck; he had severe dyspnœa for a quarter of an hour; talking and swallowing have been painful for a time and the voice has not recovered. Wassermann reaction negative.

Mr H. S. BARWELL (President) asked if there was any sign of hæmatoma. [Mr Mollison: No.] The only case he (the President) had seen in which the cord was fixed after injury was one in which there was distinct ecchymosis of the cord. The patient in that case had recovered, and he thought it likely that this patient would improve.

Simple Ligature Applicator for Tonsillar Vessels—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—The apparatus consists chiefly of a tube of glass or metal, and a carrier in the form of a wire which is notched at its distal extremity. The ligature is passed through the tube and one of the outer extremities marked with a knot. The other extremity is tied round this one in the form of a half slip-knot which is tightened. When the loop is placed round the vessel or the forceps, the knotted end is pulled upon and the tightened slip-knot is drawn down until it tightly encircles the tissue in the forceps. It is, in fact, Coakley's slip-knot, but its application is greatly facilitated by the use of the tube. The small details are sufficiently obvious, such as that the non-knotted end should be twice the length of the knotted one, and that the catgut, if used, should not be soaked to such an extent as to make it soften and swell, as it will then not slip as easily as could be wished.

FURTHER REPORT OF CASES PREVIOUSLY SHOWN.

Sinusitis Complicating Scarlet Fever, shown 6 years ago—T. B. LAYTON, D.S.O., M.S.—E. S., aged 18, was shown at the meeting on 6th May 1921, to demonstrate marked disfigurement resulting from a forehead flap when used for subcutaneous swelling above the inner end of the eyebrow (*Journ. Laryng. and Otol.*, vol. xxxvi., 1921, p. 537).

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The case is now shown to demonstrate that one's fears of extreme disfigurement have proved wrong and that the scarring is such that it can easily be covered by the coiffure. Compare Mr Archer Ryland's case (*Journ. Laryng. and Otol.*, vol. xxxvi., 1921, p. 396). and Mr Harold Kisch's case (*Journ. Laryng. and Otol.*, vol. xlii., 1927, p. 695).

Elderly Man with a Growth on the Hard Palate and Great Enlargement of Glands—NORMAN BARNETT, F.R.C.S.—Shown for diagnosis, 10th June 1927 (*Journ. Laryng. and Otol.*, vol. xlii., 1927, p. 770).

Further pathological examination showed the growth to be non-malignant. The patient gradually sank and died owing to the general toxic condition.

NEUROLOGICAL AND MECHANICAL FACTORS UNDERLYING IMMOBILITY OF THE VOCAL CORDS.*

DISCUSSION IN THE SECTION OF LARYNGOLOGY AND OTOLOGY, BRITISH MEDICAL ASSOCIATION, EDINBURGH, 20th July 1927.

(*Abstract of the Proceedings by T. Ritchie Rodger, M.D.*)

I.—THE NEUROLOGICAL ASPECT, by A. Brown Kelly, M.D., F.R.F.P.S. Glasgow.

In order to determine the etiology in a case of paralysis of one or both vocal cords, it may be necessary to pass in review the lesions to which the laryngeal motor nerve supply is liable at different levels between its origin in the cortical and bulbar centres, and its ending in the larynx.

Cortical and Bulbar Laryngeal Centres. — The larynx subserves two great functions—respiration and phonation. The chief respiratory centres are situated in the medulla and by these the cords are maintained in a state of tonicity in the respiratory position. Subsidiary respiratory centres in the cortex enable us to achieve at will a wider movement as in deep inspiration. The principal phonation centres are cortical and the less important are bulbar. A cortical lesion, therefore, is not capable of producing complete paralysis of a vocal cord. A very complete examination of the degree of immobility should be made before one attributes a laryngeal paralysis to cerebral disease. On the other hand, Broeckaert is quoted as expressing the opinion that paralysis of cortical origin would cease to be rare if, instead of merely looking for paralysis of a cord, we searched systematically for the slightest alteration in mobility or sensation and for functional disturbances

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in articulation and voice production. The chief diseases of the medulla which may involve the laryngeal centres are tabes, progressive bulbar paralysis, syphilitic arteritis and gummata, syringobulbia, disseminated sclerosis, hæmorrhages and softening from thrombosis and embolism. Laryngeal paralyses are met with in about 40 per cent. of cases of tabes.

Lesions of the Roots.—Lesions of the roots of the last four cranial nerves may be caused by meningitis, basal fractures, abscesses, tumours and aneurysms, but gummata and tabes are the commonest causes.

Associated Paralyses.—Owing to the close grouping of the centres, roots, and to a lesser extent the upper part of the trunks, of the last four cranial nerves, associated paralyses are common. Lesions at different levels produce well-defined groups of paralyses which have come to be known by certain names. Thus we have the syndromes of Vernet, Schmidt, Avellis, Tapia, Hughlings Jackson, and Collot-Sicard, as follows:—

Vernet: paralysis of the spinal accessory and glossopharyngeal (XI. IX.).

Schmidt: paralysis of the internal and external branches of the spinal accessory (XI. complete).

Avellis: paralysis of the internal branch of the spinal accessory (XI. incomplete).

Tapia: paralysis of the spinal accessory below the origin of its pharyngeal branch, and of the hypoglossal (XI. XII.).

Hughlings Jackson: paralysis of the spinal accessory above the origin of its pharyngeal branch, and of the hypoglossal (XI. XII.).

Collet-Sicard: paralysis of the four last cranial nerves (IX-XII.).

There may be also a paralysis of the sympathetic, the 8th, 7th, or 6th nerves, associated individually or in any combination with any of the syndromes.

The Thyroid Gland.—Vocal cord paralysis may be caused by disease of the thyroid gland or by operation for its removal. The nerve may be damaged by pressure, traction, torsion, or ulceration. Bilateral paralysis almost invariably denotes a malignant thyroid: intrathoracic goitre is more apt than the cervical variety to cause pressure on the nerve. The common condition is a unilateral abductor paralysis; in the absence of obvious symptoms, it is apt to escape notice unless the larynx is examined as a routine procedure in such cases. Complete recurrent paralysis, however, may occur from a break in continuity of the nerve due to ulceration. Dyspnœa, if present, may be due to narrowing of the glottis from the paralysis, but is more frequently due to actual pressure on the trachea. In bilateral cases, however, the danger of dyspnœa from the failure of movement in the cords has to be reckoned with. In some cases

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of goitre, death from suffocation has been explained by spasm of the glottis. Operation on the thyroid gland may cause paralysis by division of the nerve, by traction, and by involvement of the nerve in cicatricial tissue. An examination of the larynx should be made in every case before operation. If paralysis already exists, the surgeon is in a position to clear himself from any subsequent question of its being post-operative, and he can also take particular care to avoid the possibility of injury to the nerve on the opposite side, thus safeguarding the patient from the chance of bilateral paralysis with its attendant danger of dyspnœa.

Lymphatic Glands.—Recurrent laryngeal paralysis may be caused by pressure from enlargement of a lymphatic gland—as, for example, the tracheo-bronchial or the para-tracheal groups. The right recurrent may be involved in disease of the cervico-pleural glands at the right apex, and paralysis of the right cord always suggests pulmonary disease at the right apex. Malignant disease in the glands of the neck and mediastinum may also cause paralysis of the recurrent laryngeal, and reference was made to Dr Logan Turner's work on such cases occurring in connection with mammary cancer.

Aorta, Heart, and Pericardium.—Aneurysm of the arch of the aorta is the commonest cause of paralysis of the left vocal cord and the paralysis is usually of the complete type. The cord may be paralysed even before clinical or X-ray signs are definite. The nerve injury may be due to stretching, to neuritis, or to the action of calcareous deposit.

Apart from aneurysm of the aorta, other conditions relating to the heart and its immediate surroundings may interfere with the function of the recurrent laryngeal nerves and these are discussed in considerable detail—dilatation of the left auricle from mitral stenosis, pressure by the ligamentum arteriosum, distension of the left auricle from kyphoscoliosis and pericarditis. In these conditions the principal etiological rôle has generally been assigned to pressure, but Dr Brown Kelly professes himself in agreement with A. Adam, who suggests that an accompanying inflammatory condition in the mediastinum is more likely to be the cause and is independent of dilatation of the heart. The hoarseness may be preceded for a longer or shorter period by violent coughing, suggesting irritation of the nerve before paralysis ensues. Occasionally the paralysis passes off when the circulatory conditions improve.

The Œsophagus.—Malignant disease of the œsophagus is often complicated by paralysis of one or both vocal cords. This may arise from an extension of the disease from the wall of the gullet, or from involvement of the adjacent paratracheal lymphatic glands. The left cord is the more frequently involved, but when cancer of the cervical part of the œsophagus is considered separately, the right cord is more

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commonly affected. The paralysis is also more frequently of the abductor type in cancer of the cervical œsophagus, but this may be because the earlier production of symptoms leads to earlier examination of the larynx. Œsophageal cancer affords special opportunities of observing the successive implication of the vocal cords and of the passage of the paralysis from the abductor to the complete stage.

Peripheral toxic neuritis and myopathic paralysis may occur, but reliable information on this aspect of the subject is still scanty and of doubtful value.

II.—Mechanical Immobilisation of the Vocal Cords, by Herbert Tilley, B.S.Lond., F.R.C.S.

Very early in his career Mr Tilley met with two cases which demonstrated to him that fixation of a vocal cord is not always due to paralysis of the recurrent laryngeal nerve. In the first case the fixation was bilateral and an urgent tracheotomy had to be performed owing to the laryngeal stridor. The patient still wears the tube, but his general health is excellent; the cause of the laryngeal condition is not stated. In the second case the fixation was associated with œdematous swelling of the corresponding arytenoid and with pain in some of the larger joints of the body. The patient was treated for acute rheumatism and three months later his cord movements were normal.

In 1918, Mr Tilley had collected and published twenty-four cases of temporary or permanent fixation of the crico-arytenoid joint and, in nine of these, the immobility was not due to true paralysis. Six of the latter recovered completely and three remained *in statu quo*. The cause of the condition was not clear in every case, but was in one case acute rheumatism, in another gout, in a third influenza, and in a fourth syphilis with swelling of the arytenoid. The fact is remarked upon, that even in those cases not attributed to an affection of the recurrent laryngeal nerve, the same predilection for the left side is seen as in the more usual paralytic cases. Reference is made to mechanical fixation due to trauma, to septic infection following impaction of foreign bodies, and to the infiltration produced by tubercle or malignant disease. Mr Tilley urged that we should always bear in mind the possibility of fixation of the cord not being due to a serious lesion involving the recurrent nerve as the prognosis is so different in the two conditions. The contingency should always be in our minds when confronted with an inactive cord, but if every means within our power should fail to detect a serious etiological factor, it was then our duty to give a guarded diagnosis, and a hopeful prognosis, combined with a duly watchful or expectant treatment. He also urged more attention to the details of clinical examination and less reliance on the newer accessories to diagnosis.

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In the Discussion which followed the introductory papers, Sir James Dundas-Grant (London) said that osteoarthritis was sometimes the cause of immobility of one or both cords. He had also reported two cases in which the paralysis appeared to be due to alcoholism, complete recovery following on abstinence.

Sir St Clair Thomson thought a better title for the subject would have been "Defects of Mobility" or "Palsy and Paralysis." Immobility indicated a complete paralysis, whereas the most interesting cases and the most important were those of simply impaired movement.

During ten years of Sanatorium work he had seen twelve cases of laryngeal paralysis without laryngeal tuberculosis. One half of the cases recovered completely; in the remainder the cords remained fixed. Whether the condition was due to pleurisy or to glandular deposit was still obscure. He looked upon articular causes of impaired movement as rare, the neurological causes being the more frequent.

Professor F. R. Nager (Zürich) spoke of the involvement of function of the vocal cords in goitre and said that in Switzerland, generally, a distinct vocal palsy was taken to indicate malignant degeneration of the thyroid gland. Sometimes in rare cases of sudden enlargement, as from hæmorrhage, temporary immobility might be observed; this disappeared after operation. About 8 per cent. of operations were followed by vocal cord affections, but they were not all permanent and the figures included those due to involvement of the nerve in scar tissue. Professor Nager also mentioned a case of paralysis of the recurrent laryngeal nerve due to aneurysm of the innominate artery.

Dr V. F. Lambert (Manchester) gave an analysis of 189 cases of vocal cord paralysis compiled from the Ear and Throat Department of the Royal Infirmary, Edinburgh, during the twenty years prior to 1926. Immobility due to tumour or perichondritis was not included. Of the 189 cases, 181 were unilateral and 8 bilateral. From the table of statistics given, the most frequent causes of the paralysis were—aneurysm of the aorta (22 cases), mediastinal neoplasm (22 cases), pulmonary tuberculosis (13 cases), disease of central nervous system (13 cases), and malignant tumours of the neck (11 cases).

Dr W. S. Syme (Glasgow) said he had seen three cases of laryngeal paralysis due to invasion of the mediastinal glands in breast cancer, and suggested that a laryngeal examination should be made in all cases of cancer of the breast before they were submitted to operation. In some cases of slight paresis of the cord, the condition was present at one time and absent at another. With regard to aneurysmal dilatation of the aorta, he thought that, short of such dilatation as was demonstrable by clinical or X-ray examination, there might be such increased

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pulsation and movement of the vessel as to cause a constant "fretting" of the nerve, so as to produce thickening of the sheath and resulting pressure on the nerve fibres.

Mr C. A. S. Ridout (Portsmouth) referred to two cases, one of malignant disease of the petrous bone. There was aphonia and dysphagia and the right vocal cord was found to be paralysed. A month later the 6th and 7th cranial nerves were paralysed. The second case was one of influenza with involvement of both cords. Recovery took place and he looked upon it as a neurosis.

Mr M. E. Vlasto (London) referred to Dr Syme's suggestion about the fretting of the nerve from increased pulsation of the aorta, and said that the "roaring" of horses, common in the hunter class, was a similar phenomenon.

Professor H. S. Birkett (Montreal) stressed the importance of impressing upon students that the larynx should always be examined in the event of even the slightest disturbance of the speaking voice. In one of his cases, a slight abductor paresis was the first sign of tabes. He cited also an example of a lesion involving the cranial nerves emerging from the jugular foramen, with contraction of the left pupil, paralysis of the left side of the palate, atrophy of the left half of the tongue, and paralysis of the left vocal cord. He did not agree that the crico-arytenoid joint was seldom involved except in tuberculous or malignant disease; he had seen a gonorrhœal arthritis affecting this joint along with the knee and elbow joints of the same side. Neither did he agree that vocal cord paralysis in goitre cases was a sign of malignancy. Among French-Canadians this certainly was not so. He had also seen in several cases, paralysis of a vocal cord occurring after exposure of the neck to a very cold wind, the cause being a peripheral neuritis.

Mr W. G. Howarth (London) referred to a case of bulbar palsy with right recurrent paralysis and a gradually produced weakness of the soft palate, hemi-atrophy of the tongue, and weakness of the trapezius. He had watched the case for twelve years. Another case of right recurrent paralysis following influenza recovered after eleven months.

Dr Dan McKenzie (London) remarked on the considerable number of cases in which the paralysis lasted a lifetime without one being certain of the cause. He referred also to the puzzling cases in which right-sided paralysis was associated with aneurysm of the aortic arch, and quoted Crookshank's suggestion that in such cases there might be a syphilitic mediastinitis with cicatricial changes.

Dr Andrew Wylie (London) said that certain toxic cases probably escaped notice. Impaired mobility was often a sequel of malarial fever. He had also seen cases due to enteric fever and lead poisoning, which had cleared up completely.

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