The patient died a week after admission. During the week the temperature varied from 99.6° to 102.8°. The pulse and respirations were increased in frequency, especially the latter; the stools, not very frequent, were loose, yellow, and offensive. The faucial exudate cleared up very slowly, and it was then found that the tonsils were ulcerated. The patient's voice was weak but there were no marked signs of laryngitis.

At the post-mortem examination it was found that both tonsils were deeply ulcerated, that there was a large slough, still adherent, on each side of the upper part of the epiglottis, and that there was superficial ulceration within the larynx towards the back of the arytenoid cartilages (Fig. 2). Acute nephritis, with small infarcts, cardiac dilatation, and enlargement of the spleen were also found. Vincent's organisms were obtained in smears from the teeth and tonsils taken at the autopsy.

In both these cases the ulceration of the larynx was doubtless secondary to the disease of the teeth and gums, and, in both, was presumably due to the same cause, probably the fusiform bacilli and spirilla of Vincent. If the sloughs of the epiglottis found in Case II., had had time to separate, ulcers such as the one found in the first case would have resulted.

SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTION OF LARYNGOLOGY

President—Dr A. Logan Turner.

November 7, 1924.

Nasal Growth — Irwin Moore, M.Ch.—Female, aged 19, was first seen on 15th August, complaining of nasal obstruction for the past three months, accompanied by a thick, yellow discharge from the right nostril. Recently, vision of the right eye became slightly blurred, and she attended hospital, where the right lachrymal sac was washed out on account of purulent secretion: glasses were ordered.

At 8 years of age she complained of a mass which had formed in the right nostril during the previous six months. Her tonsils and adenoids were removed at this time, and reference to the notes of her case records that "granulations" were also removed from the right nostril.

https://doi.org/10.1017/S0022215100027080 Published online by Cambridge University Press

There is marked broadening of the nose with separation of the nasal bones. The right naris is completely filled by a hard, fleshy growth which is presenting in the vestibule, and has pushed the septum over to the left side. Posteriorly the growth is seen occluding the right choana, likewise in this position pushing the septum to the left. Here the growth is of a more polypoid character; no history of bleeding. There is slight protrusion of the right eye.

X-ray examination shows a dense opacity in the right side of the nose, pushing the septum to the left. The opacity involves the antral wall on the right side and invades the antrum and the right ethmoid cells. Opinions are invited as to treatment.

Naso-pharyngeal Fibroma extending through Spheno-maxillary Fossa to Cheek—LESLIE POWELL, M.B.—Boy, aged 15, shows with the post-nasal mirror a small nodule on the right side which does not appear to be growing. The swelling of the cheek was thought to be in the parotid.

The naso-pharyngeal tumour was removed in March 1923; it recurred, and was removed again in July. The swelling in the cheek was traced back to the spheno-maxillary fossa and was removed in August 1924. Sections demonstrated a fibroma.

Opinions as to further treatment are desired.

(*a*) **A Snare through which a Diathermy Current can be passed, intended for use in the Naso-pharynx, through the Mouth**; (*b*) **Tumour (Angio-fibroma) removed with the Snare, entirely Bloodlessly from Naso-pharynx of a Boy of 13.**—Exhibited by Mr E. BROUGHTON BARNES, F.R.C.S.Ed. (introduced by Mr E. D. D. Davis).

Mr W. STUART-LOW (discussing Dr Irwin Moore's case) said that he (the speaker) had had similar cases. It was difficult to account for the origin of the condition, but there was in this girl a history of a severe blow with a base-ball two years previously, and she states that the nose did not bleed. There must have been hæmorrhage into the tissues, and, most likely, into the maxillary antrum. It was possible that such intra-tissue hæmorrhage was the explanation of the origin of these tumours, as a similar history of injury was obtained in his patients.

As regarded treatment he would have no hesitation in thoroughly avulsing the growth from the nasal passage, at the same time clearing out the antrum and applying the galvano-cautery point to the seat of origin if it were possible to locate it. Hæmorrhage might be severe, but if thromboplastin were injected every three hours for twenty-four hours before operation, bleeding would easily be controlled.

Dr W. H. KELSON said his remarks were intended as a caution to those dealing with such cases as Dr Irwin Moore's. He had a boy, aged 8, at the hospital with one of these growths, which he removed with a snare

https://doi.org/10.1017/S0022215100027080 Published online by Cambridge University Press

and strong adenoid forceps. The boy had previously had very large hæmorrhages, but his progress was satisfactory. A fortnight after operation a final examination, before the patient left, revealed what seemed like a granulation or a small piece of growth. He (the speaker) touched this with the galvano-cautery, and there was a sudden and very severe hæmorrhage, the boy fell on the floor, and before anything could be done, he died. No autopsy was allowed.

Mr THOMAS GUTHRIE asked, in regard to Mr Leslie Powell's case, what was meant by the remark "the swelling in the cheek was traced back to the spheno-maxillary fossa." In several cases of naso-pharyngeal fibroma he had noted a swelling of the cheek, and was in doubt as to the cause of it. It did not seem to be due to the growth extending into the cheek; possibly it was associated with a portion of growth filling the spheno-maxillary fossa and causing obstruction of venous or lymphatic channels.

Dr H. SMURTHWAITE said he did not know whether Dr Irwin Moore's case was a genuine fibroma. On removal he thought it would prove to be a very thickened polypus. In a chronic case the thickness might be a quarter of an inch, and yet inside it might be cystic. He suggested removing a piece from the front; treatment would depend on what it was found to be. If a fibroma, Moure's operation could be done.

Mr A. J. M. WRIGHT said he had a patient, a boy, from whom he removed a naso-pharyngeal fibroma. Before the operation he had an indefinite swelling of the cheek on the side to which the growth was attached. Since the removal of the growth the swelling had subsided. He thought the swelling must be due to interference by pressure with the vascular supply to the part.

Dr W. HILL said that with regard to Dr Irwin Moore's case, he feared Dr Smurthwaite was somewhat over sanguine if he imagined this was an ordinary mucous polypus, or even so in part, the remainder being fibrous. The ordinary mucous polypus did not usually attack the ethmoid cells and cause proptosis, as in this instance. In one such case he (Dr Hill) had done a modified Rouge operation, which gave very fair access, but Moure's operation would be better. In the case he was referring to he was confronted with very alarming hæmorrhage, and the possibility of such in these cases led the operator to approach them with trepidation. In the case of the present patient it would be well to see what could be done *per vias naturales*, stop the bleeding, and then do an external operation.

Mr G. W. DAWSON (referring to Mr Powell's case) said a few years ago he exhibited a similar case, and objection was taken to his calling it fibroma; it was considered that the proper name for it was angio-fibroma, because of the numerous blood channels. The tumour caused a swelling in the cheek; it extended to the back of the upper jaw, and was attached to the main growth by a pedicle.

Mr F. H. WESTMACOTT said that for some time he had been accustomed to have the patient so prepared that diathermy could be employed if serious bleeding ensued. Even when artery forceps, applied to a vessel, were touched with the diathermy point, hæmorrhage ceased at once.

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Dr W. S. SYME said he agreed with Dr Smurthwaite that this was an ordinary nasal polypus due to pressure, but he did not think the possibility of its being sarcoma should be overlooked. He advised removal of the growth through the nose and opening the antrum at the same time. It was possible that it originated from the antrum, filled the nose, was of the nature of a choanal polypus, and that the fibrous condition of it was due to pressure. Posterior rhinoscopy showed what looked like an ordinary polypus, but he had had a case with the same appearance and the other part turned out to be sarcomatous.

Mr NORMAN PATTERSON said he would give radium a good trial in this case, as in some cases the patients had been cured completely by radium, no operation having been required.

Dr BROWN KELLY said he doubted if Dr Irwin Moore's case was one of fibroma, because of the patient's age (19) and absence of bleeding.

Dr JOBSON HORNE said these cases of intra-nasal, para-nasal and post-nasal tumours caused differences of opinion, not only among clinicians, but also among microscopists. The tendency was to diagnose sarcoma where it did not exist. Sarcoma was a term, and a matter of degree, and the tendency of these tumours was to kill by local extension and destruction, and not by metastases. The tumours diminished under radium treatment, so much so that the reputation of radium as a remedial measure in malignant disease had largely been built upon them. He considered radium should be given a full trial before resorting to extreme measures.

Dr IRWIN MOORE (in reply) said that against the idea of malignancy in the case which he was exhibiting was the slow growth of the tumour. The history of "granulations" having been removed from the right nostril at 8 years of age suggested that the growth might have originated at that time, recurring later but remaining latent for some years, until the recent onset of active growth. As to its site of origin, a skiagram suggested that the growth probably originated from the right ethmoid region, the right maxillary antrum being apparently not involved. The antro-nasal wall appeared to be bulging outwards.

He intended to remove the growth by a lateral rhinotomy, employing Moure's lateral incision, which would thoroughly expose the growth, and, if before operation the naso-pharynx was well plugged, he did not anticipate any trouble with hæmorrhage, since it could be easily controlled. He would report further at a later meeting.

Mr E. BROUGHTON BARNES (in reply), said that he had designed a snare for the tumour he showed ; he had not had any other opportunity of using it. The patient had had two extensive hæmorrhages before he (the speaker) saw him. There was no hæmorrhage at the time of the removal, nor at any other time.

Mr LESLIE POWELL (in reply) said that at first he did not realise what was the nature of the swelling in the cheek. He removed the naso-pharyngeal growth through the antrum, by diathermy. A little of the swelling went down and left a well-defined tumour in the cheek. He thought this was due to a calculus blocking Stenson's duct and referred him

https://doi.org/10.1017/S0022215100027080 Published online by Cambridge University Press

to Mr Joyce, who turned back a flap and removed the tumour, which proved to be fibroma.

In reply to Dr Brown Kelly, he said he did not notice anything on the left side, except that the septum was pressed over to that side by the large growth, which had been there for two years. The bleeding was not very severe, and when it occurred it was arrested by the use of diathermy. The nodule in the naso-pharynx seemed now to have disappeared.

Two Specimens showing Ulceration of the Larynx associated with Vincent's Organisms—E. W. GOODALL, O.B.E., M.D. (introduced by Mr T. B. Layton). The cases are published *in extenso* in the *Journal of Laryngology and Otology*, February 1925, p. 115.

DISCUSSION.

Mr PHILIP FRANKLIN mentioned a case under his care, of a man, aged 33, who had an infection and ulceration of the tonsils, soft palate, lymphatic tissues behind the posterior pillar, and the posterior pharyngeal wall. His general condition was that of septicæmia. Diphtheria was suspected and an antitoxin given. A swab was taken and proved to be negative. A swab for diphtheria also failed to reveal the presence of Vincent's organisms, although Vincent's angina was subsequently suspected. The temperature ranged between 102° and 104° F., the pulse 95 to 115. During this period acutely tender spots occurred in the middle of both tibiæ and radii.

The throat was treated with tincture of iodine and salvarsan powder, and injections of arthritin were given. After three weeks the general condition improved but the local condition did not alter. A Wassermann test was made and proved to be positive. One intravenous injection of salvarsan produced an immediate improvement of the throat condition.

The case was undoubtedly one of acute syphilis, probably aggravated by a mixed infection, pneumococcal or streptococcal in nature.

Mr G. WILKINSON said he had seen many persistent Vincent's angina infections in both throat and gums, during the war period, and in one or two cases resolution occurred after not only the local application of "606," but by intravenous injection of a small dose. These cases showed a negative Wassermann reaction. Bar of Nice had written an article in which he drew attention to the serious complication of infection by moulds and yeasts along with Vincent's angina. In many resistant cases those organisms might be responsible for the persistence of the lesions.

Mr LESLIE POWELL said the organisms of Vincent's angina sometimes remained latent in the tonsils when signs of ulceration had disappeared from the mouth. In the War Hospital he removed tonsils after Vincent's angina had been apparently cured, and there was an immediate flare-up of the disease. It did not recur after further treatment with "606."

Dr E. W. GOODALL (in reply) said that the young man died of acute nephritis following scarlet fever, and the woman had septicæmia, nephritis, and broncho-pneumonia. He considered the laryngeal condition was secondary to that in the mouth and throat. His experience was that cases

https://doi.org/10.1017/S0022215100027080 Published online by Cambridge University Press

of Vincent's angina had been more common since the War. Vincent originally described the disease as being confined to the tonsils, but it was now clear that the condition might extend to the larynx, though it was rare for this to happen.

Tuberculosis of the Larynx with an unusual degree of Involvement of the Base of the Tongue—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Male, aged 35, with physical signs of pulmonary tuberculosis but no bacilli in the sputum; complained of difficulty in swallowing, especially on the right side of the throat. When seen in March of the present year the laryngoscope revealed extreme thickening of the epiglottis with superficial ulceration on its lingual surface. A portion of tissue removed from the epiglottis was found on section to contain giant cells and necrosis of tissue with some fibrosis. He used an inhalation of anæsthesin and orthoform powder, while trichloracetic acid was applied to the ulceration. The pain diminished very considerably, but when seen again more recently, there was found to be an excavated ulcer on the base of the tongue in front of the epiglottis, continuous with the ulcer on the lingual surface of the epiglottis.

Hyperplastic Laryngitis (with Microscopical Section)—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Male, aged 34, complained of hoarseness but especially of difficulty in breathing, with stridor, which interfered considerably with sleep. He was sent to Brompton Hospital as being probably a case of tuberculous laryngitis, but no pulmonary signs were found and repeated examinations of the sputum revealed no tubercle bacilli. Laryngoscopic examination showed general rounded swelling of the epiglottis with fairly normal contour and shiny surface, while the ary-epiglottic folds were extremely enlarged, the swellings being mobile or floppy to such an extent that they were sucked in, more especially the left one, during inspiration. A portion removed for microscopical examination was found to contain areas of hyperplasia of epithelium, foci of necrosis and chronic inflammatory changes, and a section stained for bacilli contained none. The breathing was only slightly improved, but the subsequent removal of a much larger portion made the breathing quite easy, and this it has continued to be ever since. There is still a little want of clearness in the voice, but otherwise the patient's condition is quite satisfactory. He inhales powder consisting of anæsthesin and orthoform whenever he has any feeling of fullness in the throat.

The exhibitor found a somewhat similar appearance in a case* of acromegaly (under the care of Dr Wyndham Milligan) in which the discomfort was of the same nature and was completely relieved by the removal of a large portion of each hyperplastic ary-epiglottic fold.

* For notes of case see the *Lancet*, 1905, ii. p. 590.

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Royal Society of Medicine

Sir ST CLAIR THOMSON suggested that the case of hyperplastic laryngitis was undoubtedly one of tuberculosis, and if he were asked for proof of it, he would say, first, the age of the patient, and various negative results of investigation—he presumed the Wassermann test had been done. The patient was not at an age when the condition was likely to be malignant. Still, it could only be settled by direct inspection. In spite of no tubercle bacilli being found, and in spite of the negative microscopical appearance, he did not doubt that the condition was tubercle, and, even if its nature was doubtful, he strongly advised that tracheotomy should be done. Tracheotomy was, he considered, too little resorted to as a curative method; it was simple and safe, and there could be very little objection to it. Mr Howarth and he had had, together, the case of a retired medical man, aged 70, with a similar condition. It was suggested that this case was malignant; Dr Perkins gave a negative report in regard to tubercle but after much persuasion the patient agreed to tracheotomy being done, and this was carried out in June 1923. That day he (the speaker) had received a letter from the patient stating he had got well, that he had discarded his tracheotomy tube, and had played golf.* He had also the case of another medical man, with a similar condition, who refused tracheotomy. It was five years before he died, and no tubercle bacilli had ever been found at all. At the end he had to undergo tracheotomy in order to avoid asphyxia, and he might as well have had it done earlier to save his life.

He (the speaker) warned younger members as to removing pieces of growth from larynges in which tuberculosis was suspected for the sake of arriving at a diagnosis which could be made without it. It rarely settled the diagnosis, but opened the way to secondary infection. These patients bore operation badly, and removal of pieces for examination was likely to lead to trouble.

Dr JOBSON HORNE adversely criticised Sir St Clair Thomson's suggestion that tracheotomy should be done as a curative measure in laryngeal tuberculosis; speaking generally, he himself considered that tracheotomy was a thing to be avoided in laryngeal tuberculosis. Cases of the disease occurred in which the operation was necessary to overcome stenosis and obstruction, but such were few in number. It was a pity the two cases had been discussed together as they widely differed. The unusual features about the second case were that the thickening of the epiglottis and the arytenoids was so symmetrical, and the disease was so confined to the extrinsic part of the larynx. He thought the exhaustive report from Brompton Hospital, negativing tuberculosis, was important evidence. Moreover, as the internal operative measures upon the larynx by Sir James Dundas-Grant had been so successful in making "the breathing quite easy," "as it has continued to be ever since," tracheotomy as suggested by Sir St Clair Thomson was certainly not called for.

Dr LOGAN TURNER (President), said that he failed to find microscopical evidence of tubercle in the slides in the case of hyperplastic laryngitis, but, clinically, he was inclined to take Sir St Clair Thomson's view.

* Case shown at December Meeting, 1924, see *Proceedings*.

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Sir JAMES DUNDAS-GRANT (in reply) said that it would be interesting to know whether Sir St Clair Thomson had ever seen a case presenting this œdematous "floppy" character. To himself it did not look like a tuberculous infiltration. He removed a small portion for microscopical examination. The man had inspiratory stridor, which prevented sleep, owing to the softness of the ary-epiglottic folds, which were drawn in. He (Sir James Dundas-Grant) then removed a large portion from each fold, and since then there had been good breathing.

He would watch the case, and bring it forward again.* The condition was very similar to what he saw in a case of acromegaly; the discomfort was the same. He removed the trouble completely by punching out a considerable portion from each ary-epiglottic fold, and there had been no recurrence.

SECTION OF OTOLOGY

November 8, 1924.

President—J. KERR LOVE, M.D.

Nævoid Angioma of the Tympanum (? Endothelioma). Microscopical Section—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Male, aged 29, had suffered for a little over a year from attacks of giddiness. A specialist found a swelling in the depth of the meatus involving and occluding the postero-inferior two-thirds of the tympanic membrane. There was lowering of the caloric reactions of the labyrinth. Paracentesis was followed by so much hæmorrhage that he suspected the presence of a bulging of the jugular bulb.

I saw him three months ago and found the condition as reported. The swelling was smooth and red, pulsating when felt with a probe and resilient after compression, bleeding when manipulated.

A portion was removed for microscopic examination. The hæmorrhage was considerable but could be controlled with enough ease to exclude the diagnosis of projection of the jugular bulb.

The microscopical examination showed it to be a nævoid angioma on which possibly an endothelioma had arisen.

Removal was carried out by means of sharp spoons and free use of the galvano-cautery, a ready approach being afforded by detachment of the auricle and membranous meatus, and enlargement of the bony meatus by means of the gouge and by Körner's flap. There seemed to be no deep extension into the bone, the growth apparently arising from the tympanic membrane and mucous membrane of the adjacent floor of the cavities.

The tissues removed at the mastoid operation were reported to

* Report to hand that the patient is wonderfully improved, the vocal cords being easily seen.

https://doi.org/10.1017/S0022215100027080 Published online by Cambridge University Press

consist of the remains of an angioma "without any evidence of epithelial or sarcomatous new-growth."

When seen recently the patient felt perfectly well, but there was a small elastic swelling in the postero-inferior part of the tympanum. This was punctured with the galvano-cautery point and again with the zinc electrolytic needle. The question of radium treatment is under consideration.

A case of the same kind is described by Fischer, and criticised by Wittmaack; a case has also been exhibited by Dr Peters. In the latter, although the nævus was confined to the tympanic cavity, there was interference with the labyrinth. My operation in this case was performed in July 1924.

Specimen of Bony Ankylosis of Malleus and Incus—E. WATSON-WILLIAMS, M.C.—The specimen shows bony ankylosis of malleus and incus, with filling up of the groove lodging the capsular ligament of the joint. The whole of the long process of the incus, and the tip of the handle of the malleus, have been destroyed; but the bones are otherwise not obviously diseased. The specimen was removed at operation from a young man who had been deaf for many years, with otorrhœa. The exhibitor would like to know the frequency of this condition.

Mr SYDNEY SCOTT said that the beautiful way in which the specimen had been demonstrated by the exhibitor was a method new to him.

Mr A. R. TWEEDIE said that the specimen shown served to emphasise the importance of indicating the exact locality of disease, rather than employing the loose expression "chronic suppurative otitis media"—a point to which he had already directed attention.

Sir JAMES DUNDAS-GRANT said that in cases of ankylosis of malleus and incus without perforation a diagnostic sign would be a labyrinthine "fistula symptom" on suction. In cases which he knew of there was action by suction upon the fenestra ovalis, the disturbance of equilibrium being enormous. One obtained a nystagmus in the opposite direction to that usual in fistula of the external canal. The suction did not merely act on one canal, but on them all. In one case the membrane of the fenestra ovalis was visible, and suction caused such a disturbance that the patient almost fell off the chair. When this was elicited in a person with a normal membrane, one must expect to find ankylosis of the malleus and the incus.

Dr J. KERR LOVE (President) said that in the intra-tympanic stage the mastoid operation was usually hurried too much, and enough notice was not taken of what was removed from the middle ear. It would be well to observe carefully the conditions in the tympanum.

Results of Zinc Ionisation in Chronic Otorrhœa in over 600 Cases—A. R. FRIEL, M.D.—In 1900, Professor Leduc of Nantes, began to publish his discoveries on the method of treatment which we

https://doi.org/10.1017/S0022215100027080 Published online by Cambridge University Press

call ionisation with the principles governing its application. The present statistics show the results obtained by applying his principles in the treatment of local sepsis in chronic otorrhœa. The patients were school children at the London County Council Ionisation Clinics, held weekly. While attending they received no other treatment whatever.

Table I. gives an analysis of the causes of chronicity met with in these cases; the number of cases in which a particular condition was regarded as the main element in the case; and the results obtained. For convenience the table is drawn up largely on the anatomical basis to which we are accustomed. In the tympanic cases it is possible to state both the position and the conditions present, but in the attico-mastoid cases it is only possible to state the position.

TABLE I.

Otological Classification and Summary of Results of Suppurating Ears treated by Ionisation.

Cause of Chronicity.	Total.	Cured.	Lost Sight of.	Still under Treatment.	Sent for Operation or other Treatment.
I. *Tympanic conditions*—					
(*a*) Tympanic sepsis	251	234	17	...	...
(*b*) „ „ + granulations	82	61	16	5	...
(*c*) „ „ + polypus	29	18	5	3	3
(*d*) „ „ + caries	4	2	2	...	...
(*e*) „ „ + cholesteatoma	3	1	2	...	...
(*f*) „ „ + other conditions	3	2	1	...	...
II. *Tympanic conditions + involvement of the Eustachian tube, nose, pharynx, or mouth*	37	18	9	4	6
III. *Tympanic conditions + attic or mastoid*	173	35	40	11	87
No previous operation	...	24	33	6	72
Previous operation	...	11	7	5	15
IV. *Tympanic conditions + external otitis*	14	9	2	1	2
„ „ + *stricture of meatus*	1	1	...	...	...
V. *External otitis*	12	9	2	1	...
VI. *Tympanic conditions + cause undetermined*	7	4	2	1	...
Total	616	394	98	26	98

The incidence of the special causes of chronicity shown in the table approximates to, but is not quite identical with, the actual incidence, for a fair number of children come to the clinic in whom the otorrhœa is very slight, and, as a rule, these are not ionised. Boracic powder is insufflated, and they are directed to return in a week. Usually the otorrhœa has then ceased. If so, they are discharged, and they are not included in these statistics. A few others obviously require operation, or live too far away to attend again, or, they or their parents object to electrical treatment. These, too, are not included.

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It will be seen that the majority of the cases fall into two classes—those in which the cause of chronicity is to be found in the tympanum, and those in which it is found also in the attic or mastoid. Contrary to what might be expected there was not a large number in whom it was considered that the maintenance of the otorrhœa was due to throat and nose conditions.

Table II. gives an analysis in the cases of tympanic sepsis of the number of ionisation treatments and the number of visits paid to the clinic till the discharge ceased. This table shows the kernel of the ionisation case in its scientific and economic aspects.

TABLE II.

Analysis of Treatment of Cases of Tympanic Sepsis.

A.—CURED.

Number of Cases.	Number of Ionisation Treatments.	Number of Visits till Discharge ceased.	Number of Cases.	Number of Ionisation Treatments.	Number of Visits till Discharge ceased.
143	1	1	4	2	5
41	1	2	1	2	6
7	1	3	2	3	3
4	1	4	1	3	4
1	1	6	1	4	6
1	1	8	1	4	7
9	2	2			
10	2	3	234		
8	2	4			

B.—LOST SIGHT OF.

8	.	1 visit, 1 ionisation	1	.	4 visits, 2 ionisations
3	.	2 visits, 1 „	1	.	4 „ 3 „
3	.	3 „ 1 „			
1	.	3 „ 2 ionisations	17		

Zinc ionisation was used by Professor Leduc as the remedy for local sepsis. The treatment of tympanic sepsis by this method resembles a laboratory experiment in which the conditions are so arranged as to give a decisive answer to a single question. The table shows that one may expect in such cases a rapid cessation of the discharge.

The only treatment given to these patients was zinc ionisation without or with insufflation of boracic powder.

To turn to the attico-mastoid cases. In a few a favourable result has been obtained. The diagnosis of mastoid or attic disease has been made by observing pus on aspiration from the aditus region, or discharge at Shrapnell's membrane. Zinc ionisation produces coagulation of albumin. As a result of the sterile barrier formed, the inflam-

https://doi.org/10.1017/S0022215100027080 Published online by Cambridge University Press

mation of these tissues diminishes, and it is often possible to determine where the discharge is coming from.

Table III. summarises in general outline the principles by which the writer is guided in the treatment of chronic otorrhœa.

TABLE III.

Indications as to Treatment based on Cause of Chronicity.

Cause of Chronicity.	Treatment.
I. Accessible sepsis, *e.g.*, tympanic sepsis.	Zinc ionisation with or without boracic powder insufflation.
II. Accessible sepsis with second factor in ear, *e.g.*, polypus.	Remove second factor then ionise ear.
III. Accessible sepsis with inflammation in a neighbouring organ, *e.g.*, rhinitis.	Treat neighbouring organ and ionise ear.
IV. Inaccessible sepsis, *e.g.*, cavity in mastoid, opening directly into tympanum.	Use special instrument to gain access (*a*) attic cannula; (*b*) gelatin covered wire.
Attic disease.	or, make area of sepsis accessible.
Chronic mastoiditis.	*e.g.*, destroy outer attic wall, ossiculectomy, partial or complete mastoid operation, and then ionise.

Ionisation is not a remedy for chronic otorrhœa, but it is a remedy for sepsis, and as sepsis is frequently the cause of chronicity in cases, it happens that zinc ionisation is a remedy for many cases of chronic otorrhœa. Cases are unaffected by ionisation when the process cannot "get at the spot."

Dr. A. G. WELLS said he would like to bring before the Section some points of interest in connection with ionisation, in his capacity as aurist to the London County Council. In addition to the useless treatment which obtained at the sixty treatment centres at the hands of nurses, he had incorporated in his scheme of treatment that by ionisation, and hospital treatment for the purpose of operating on mastoids. The hospital was a Metropolitan Asylums Board institution in London, which commenced its work in 1917. Over a large number of cases, his results closely approximated those Dr. Friel had now put forward.

The number of operations done for chronic mastoid disease in London was comparatively small; most were on acute cases. It would be agreed that the former were unsatisfactory, as the majority of cases left hospital before they were healed. This was due to the demand for beds, and to the fact that the after-treatment was in the hands of house-surgeons. Sooner or later, cases operated upon for chronic disease found their way to him and a proportion was healed without further operation. In a large number of cases something further had to be done. One of the trying features of these cases was after-treament, and it was with the object of shortening

https://doi.org/10.1017/S0022215100027080 Published online by Cambridge University Press

this period that he had adopted ionisation treatment for some years as a routine measure.

In 1920, the operations done at the hospital numbered 118, and in about 80 it was successful, giving a figure of 67·7 per cent. In 1921, 158 patients were operated upon, giving 87·3 per cent. of successes, and last year (1923) the number was 137, of which 129, or 94 per cent. were successful. It was difficult to get an idea of the percentage of patients operated upon at general hospitals who were cured, but careful investigation over a definite period led him to say that 15 to 20 per cent. at the outside were cured as a result of the operation done at the general hospital. Latterly, ionisation was begun closer to the date of operation. Though he did not attribute the whole of the good after-result to the ionisation, it was an important factor. Another was the increased experience of those looking after the cases. Last year, the average length of time per case was sixteen weeks from operation to date of healing. There were sixty-four cases for which he arranged an intensive course of ionisation; *i.e.*, it was commenced within a day or two of the operation and administered on several occasions. In those, the average length of time per case from operation to healing was 10·9 weeks, as compared with the sixteen weeks for the less intensive treatment. As a result of this treatment he had noticed reduction of the inflammation, clearing up of the wound, and lessening of the pain. At one period the 94 per cent. of cures dropped to between 70 and 80 per cent., and that was traceable to the work being indifferently done, and to the fact that there was a new staff of house-surgeons inexperienced in the work. He asked if others had undertaken this procedure, as it would be of interest to compare experience and results.

Mr J. S. FRASER said it was well known that when a new remedy or a new method was introduced, there was a tendency for a very brilliant impression to be entertained respecting it; then, as years went on, colours faded and something like a true picture was recognised. The specialty had experienced this in regard to the treatment of otosclerosis by blistering the drumhead or by injections of fibrolysin followed by massage.

As a result of his own experience of ionisation, he was not prepared to homologate the opinions expressed by the last two speakers. He certainly did not agree with Dr. Wells as to the poor results following the radical mastoid operation. He found that by the immediate skin-grafting of the cavity by Mr. Marriage's method one could obtain at least 70 per cent. of cures. Dr. Wells had also mentioned the prolonged and painful after-treatment of these cases. After skin grafting the first dressing was done on the fifth day after the operation, usually without any pain, and the wound was repacked with iodoform worsted; the second dressing was done one week after operation and there was no packing after that. As a rule, patients left hospital within fourteen days of the operation, many of them in ten days, and in Edinburgh the patients were sent to the convalescent home, where they remained three weeks. The after-treatment could be carried out by anybody with brains and a pair of hands. In any case a nurse could do all that was necessary, with peroxide drops and syringing. The superficial layers of the graft came away, and at the end of five weeks

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the cavity was lined by smooth epithelium, and a week or two afterwards it became white and glistening. It was true that some cases did not do so well as this, but his own experience of trying zinc ionisation in cases which did not dry up after operation had not been good. In these the Eustachian tube remained open and there was a mucoid discharge The patient, however, was free from any danger of a labyrinthine or intracranial complication. Ionisation was not always free from pain. Children did not like it, especially with a current of more than two milliampères. The conservative (wet) method of treating chronic middle-ear suppuration, carried out at his clinic, gave 50 per cent. of cures or apparent cures. Of the remaining 50 per cent. ionisation would cure less than half, and the remainder, which belonged to the attic and antral group were not cured. Even cases which were supposed to have been cured by one or two ionisations were apt to relapse. If cases were seen again in a month or two, it was often noted that the discharge had returned. Therefore, though all possible help was needed in regard to these cases of chronic purulent otitis media, it was not wise to be too enthusiastic about the results of ionisation.

Mr E. WATSON-WILLIAMS asked whether this method of treatment was applicable to the adult as well as to children. He had found that even 2 milliampères of current disturbed the adult considerably, even when a second anode was placed on the opposite mastoid. He used the method in a Pensions' clinic for about a year, only for the resistant cases, and the number of successes did not warrant a continuance of the treatment. In one clinic, he had had 37 radical operations ; 34 were completely successful. There was an enormous gap between that proportion and the 15 to 20 per cent. mentioned by Dr Wells.

Dr WELLS asked leave to explain his meaning. He said it was difficult to ascertain the exact proportion of cases which cleared up. He had to take, for a certain period, a large number of cases which had been operated upon in hospital, and to find out whether they cleared up as a result of the first operation. In *that* series he found that 15 to 20 per cent. was the proportion which had cleared up. That might not be the true figure for all, cases, but in the majority of instances the patients who were operated upon needed something further to obtain a cure. The procedure was as applicable to adults as to children, and he did not consider the treatment an unpleasant one. He had a special clinic where over 2000 ionisations a year were being done, and in the great majority no unpleasant symptoms were caused. In answer to Mr Fraser he (the speaker) did not suggest that the radical mastoid operation was not successful ; his idea was to find out whether, by ionisation, the length of the after-treatment could be diminished, and his conclusion was that ionisation, applied intelligently did accomplish that.

Dr J. KERR LOVE (President) said it was necessary to keep in mind that this was a particular application of a general principle. If the cavity was wide enough to be kept clean and it was well drained, it would heal. There were many ways of doing that, of which zinc ionisation was one. In Glasgow it was used for the old cases in which cure had not resulted.

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Dr FRIEL (in reply) said that in cases of chronic otorrhœa it was important to state what factor one was treating. Strictly speaking, zinc ionisation was not a remedy for chronic otorrhœa but it was a remedy for sepsis, and as sepsis in the accessible tympanum was frequently the cause of chronicity, zinc ionisation was a remedy for many cases of chronic otorrhœa. But cases were unaffected by ionisation when the sepsis was in a position which was not accessible. In such cases one might try, but seldom with success as far as his (the speaker's) experience went, to gain access by the use of special instruments such as an attic cannula; or one might make the area accessible by operation and ionise subsequently. This was the method Dr Wells had adopted with the result which he stated. With regard to the idea that it was an unpleasant form of treatment a good deal depended upon the kind of rheostat which was used. If one chose the water rheostat designed by Leduc, the graduation of the current could be so gentle that unpleasantness was minimised. That could not be said when one cell was introduced after another by a handle passing over studs. Children occasionally fell asleep during the treatment. Ionisation was equally applicable in the case of adults. Zinc ionisation did not guarantee that there would be no recurrence, but in his experience recurrence of discharge in tympanic sepsis cases was uncommon. In regard to cases in which polypi or granulations were present he made it a rule to see the child again in a month before discharging it from the clinic.

Tubercular Disease of the Mastoid—FRANCIS MUECKE, C.B.E., F.R.C.S.—Patient seen 1st October 1924, with otorrhœa for two years, and circumscribed mastoid swelling for one month. The discharge came from a sinus communicating with mastoid process. The swelling was a typical suppurating tuberculous gland. Whole cap of mastoid separated as one sequestrum, greenish in colour, exposing dura and sinus freely. Further large sequestra of outer table of occipital bone removed.

Treatment.—Direct sunlight: excellent progress.

Malignant Disease of Tympanic Antrum—FRANCIS MUECKE, C.B.E., F.R.C.S.—One month of impairment of hearing; two weeks with facial paralysis.

Hard swelling completely surrounded meatus with bleeding granulation in centre. Sections showed malignant disease.

On 24th February 1924: Free removal made with knife and chisel; origin found to be in the antrum, and the disease had broken through into the meatus, extending upwards and downwards. Free use of diathermy was made over bone and light use in middle ear.

Recovery was good. One attack of cellulitis ensued, necrosed bone slowly separating. Microscopic section from meatus, showed malignant epithelial disease of parotid type.

Complete Sequestrum of Petrous Portion of Temporal Bone—FRANCIS MUECKE, C.B.E., F.R.C.S.—Male, with middle-ear suppuration, following shell-burst in France, in 1916; continuous

https://doi.org/10.1017/S0022215100027080 Published online by Cambridge University Press

suppuration since; facial palsy fourteen days. There was great difficulty at operation in making sufficient room to remove sequestrum. Carotid was easily seen; no sign of any tubercular disease; complete recovery and mastoid healing.

Mr SYDNEY SCOTT said that the sequestrated labyrinth was a perfect specimen. He remembered one similar in St. Mary's Hospital Museum. They had also had one at St. Bartholomew's. In the course of a radical mastoid operation, a sinus was found in the region of the external semicircular canal. Mr. West passed in a probe and felt bone rocking. It proved to be a sequestrum of the whole labyrinth. It was easier to remove such a sequestrum if the facial nerve was destroyed, but in the case at St. Bartholomew's the nerve was intact and the labyrinth was removed in two sections.

Mr J. S. FRASER (discussing the sequestrum case) said that many otological text-books stated that necrosis and sequestrum formation were common in chronic middle-ear suppuration of the ordinary pyogenic type. This had not been his experience. If a sequestrum was found at operation, subsequent investigation usually revealed the fact that the case was tuberculous. Mr. Muecke, however, told him that it was apparently not so here. He agreed that in bad cases of acute scarlatinal otitis media and mastoiditis there might be sequestrum formation. These cases also were rare. He was at a loss to understand what process had produced the large sequestrum in the present case.

Mr G. J. JENKINS said that a mass destruction like that in the sequestrum case was very difficult to explain, and he wondered where the lesion which cut off the blood supply was situated. Had there been a localised meningitis in the neighbourhood of the internal auditory meatus, or septic labyrinthitis?

Mr MUECKE (in reply to discussion on the last case) said that he did not know whether the explosion had anything to do with the condition; it was feasible to think it had, especially as the patient said he did not suffer from any trouble of the kind until after the explosion. Possibly a fracture was produced at the time. No trace of disturbance of taste or of any other nerve function could be found.

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