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THE VALUE OF ENDORHINOSCOPIC EXAMINATION.

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To the average general practitioner there is one method of examining the nasal cavities, and one way only—that known as "anterior rhinoscopy"—practised more or less imperfectly by means of various specula, most of them badly adapted to the nose to be inspected. A few, more advanced, realise that a something further can be learned if the examination is also conducted under the influence of cocaine. Most know of the use of the posterior rhinoscopic mirror, but very few practise it with any ease or advantage.

Even the majority of rhinologists are somewhat restricted in method; anterior and posterior rhinoscopy, digital examination, transillumination, skiagraphy appear to form the extent of their means of obtaining knowledge. Conversation with them leads to the conclusion that, with one or two exceptions, they never go beyond these time-honoured methods, and pay no heed whatever to the possibilities of endorhinoscopy. The one or two exceptions are, however, quietly practising endorhinoscopic examination.

Taking up certain well-known text-books at random, one finds the following:

Tilley ("Diseases of the Nose and Throat," edition 1908) describes anterior and posterior rhinoscopy, but makes no mention of any other method.

Thomson ("Diseases of the Nose and Throat," second edition, 1916) describes anterior and posterior rhinoscopy; median and deep rhinoscopy by means of Killian's long nasal speculum; Yankauer's nasopharyngoscope, and, doubtfully, dismisses Hay's pharyngoscope.

Ballenger ("Diseases of the Nose, Throat and Ear," fourth edition, 1914) appears to consider any description of nasal examination methods as beneath notice.

The late Major Porter, in his excellent manual ("Diseases of the Throat, Nose and Ear," second edition, 1916) gives the best description of all. He mentions Hay's and Holmes's instruments for examining the nasopharynx (that no nasal examination is complete without a careful investigation of the post-nasal space goes without saying), but makes no allusion to the use of the latter in the nasal chambers themselves.

As a matter of fact, not one of these four books appears even to consider the possibilities or advantages of endorhinology.

Let us review for a space the usual methods employed for rhinoscopic examination.

Anterior Rhinoscopy.—This, practised with whatever speculum—Frankel, Lennox-Browne, and Thudichum—is most easy of manipulation to the observer, is the most universal. It is doubtful whether the majority of general practitioners ever uses any other. Properly carried out, which means the movement of the speculum in various directions, and combined with the use of a wool-armed probe, it tells us a great deal. With the added advantage of a weak cocaine solution, it tells us more, and no anterior rhinoscopy should be deemed complete without it.

Posterior Rhinoscopy is often difficult, sometimes impossible. Carried out with the aid of a palate hook, it is not pleasant for the patient. It requires considerable skill and practice, and in the hands of a really expert manipulator, yields most useful information. But even the most expert posterior rhinoscopist may be defeated. Further, when using the posterior rhinoscopic mirror, it is very rarely possible indeed to do anything else in the way of applications, etc.

Digital Examination.—Digital examination, as one of the roughest and most unpleasant methods of exploration of the post-nasal space and choanæ, is well known. It need not be dilated upon here. It teaches us something. Also the surgeon, who has a delicate fourth finger, can occasionally obtain quite useful information by introducing it into the nasal cavities *via* the anterior nares. But it requires an anæsthetic.

Transillumination, another well-known method of investigation, is usually a mere adjunct, giving no additional evidence as to conditions, partly or wholly diagnosed by other means. But I wonder how many rhinologists have ever realised the advantage of anterior rhinoscopy whilst the patient has the transillumination lamp in the mouth. The illumination of the nasal cavities by the light coming through the posterior nares and through the translucent palate often very greatly aids the use of the anterior speculum.

But none of these methods gives any opportunity of seeing into the various nooks and crannies of the nose. By these careful exercises one learns much, but much also remains unseen. It is for the otherwise unseen that endorhinology is so valuable.

Some attempt at endorhinology is aimed at by Killian's long nasal speculum. I tried this method years ago, but gave it up as unsatisfactory. Even under cocaine it was uncomfortable, painful, and did not find the information obtained by its use commensurate with the attendant discomfort. I have occasionally used it since then when the patient has been under a general anæsthetic. Even then, however, it gives but a small and sometimes distorted view.

For adequate endorhinology, therefore, one must find some other instrument. Now, for examination of the nasopharynx there are two—those of Hayes and Holmes. The former is introduced through the

mouth, under the soft palate; I have never used it, and do not know whether it could be utilised in the nose. The latter is passed, like a Eustachian catheter, through the nose into the post-nasal space. It is this instrument that I have employed during the past six years. I showed it at the Otological Section of the Royal Society of Medicine in 1912 (*Proceedings*, vol. v, pt. iii, Otol., p. 11), but it excited little interest and the Fellows appeared to regard it as a useless toy.

For about three years I used Holmes's electric nasopharyngoscope solely for exploring the post-nasal space and found it invaluable for diagnosis. It seemed to open up a new aspect of the relation of the nasopharynx to ear disease. Then it occurred to me that an instrument which gave me such good results in one region might prove equally useful in an extended sphere and I began to use it for the nasal cavities themselves. In this paper I propose to give a general account of the results obtained.

When using the instrument, it is preferable to cocainise the nose lightly, the application of a 5 per cent. solution with a cotton swab to the lower part of the nasal septum being quite sufficient. The tube is then passed through the nose into the nasopharynx like a Eustachian catheter. The light switched on, the eye is applied to the large lens-carrying end. As the instrument can be turned in its collar, every part of the nasopharynx can be examined. The tube can then be slowly withdrawn through the nose and each part explored. If necessary, the instrument can be introduced at an angle with the floor.

Examination of the Nasopharynx.—Before discussing what the nasopharyngoscope reveals when used in the nasal cavities, a few words may be devoted to its use in the post-nasal space. By slowly turning the tube until it has performed a complete circle, a very comprehensive view of the roof, choanae, Eustachian tubes, and other features of the space can be obtained. Indeed, the use of the instrument, in showing differences in the Eustachian tubes, etc., greatly widens one's ideas as to the nasopharyngeal conditions associated with middle-ear deafness. To illustrate this, I have made sketches of some of the conditions which I have actually observed. Fig. 1 shows the appearance of the normal Eustachian tube, drawn from a young woman, aged twenty-five, whose nose, ears and hearing were normal. Unfortunately, pen-and-ink sketches give no idea of the colour, which is a fairly uniform pink. The lumen, lips, and floor of the tube can be distinctly seen, and Rosenmüller's fossa is indicated by the shadow behind the Eustachian cushion. If the patient be told to swallow or phonate, the movements of the tube can be seen distinctly, and on several occasions I have noted a rhythmic movement of the ostium with deep breathing.

In cases of middle-ear deafness, the appearances of the Eustachian tube and nasopharynx vary considerably. Fig. 2 is a sketch done quite recently of a moderate adenoid mass in a boy, aged twelve. He was reported to have had adenoids removed by a general surgeon a year before, but deafness having increased, he was brought to me for a further opinion. His general practitioner did not believe he had any adenoids, but the mass shown in Fig. 2 was removed with excellent results. I might point out here that, as a general rule, the picture given of adenoids both by the nasopharyngoscope and by the posterior rhinoscopic mirror is always misleading as to the size of the mass; removal proving it to be larger than it looked.

The picture shown in Fig. 3 is an interesting one. A girl, aged ten,

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

FIG. 7.

FIG. 8.

FIG. 9.

FIG. 10.

FIG. 11.

FIG. 12

FIG. 13.

FIG. 1. Normal right Eustachian tube opening; female, aged twenty-five.—FIG. 2. Adenoids; female, aged twelve.—FIG. 3. Unremoved adenoids in left Rosenmüller's fossa, pressing on Eustachian cushion; male, aged ten.—FIG. 4. Adhesions in right fossa of Rosenmüller interfering with proper movements of

had adenoids removed by a general surgeon six months previously. When I saw her she had an acute left suppuration. The nasopharyngoscope showed a mass of adenoids crowding Rosenmüller's fossa. This was intensely congested, so that it looked like a collection of minute strawberries. There was a similar, smaller adenoid mass in the lateral recess on the opposite side, but it was the left mass that seemed to have got the full strength of the infection. Evidently, in this case, the surgeon had been content to remove a large central mass of growth and had neglected to clear the lateral recesses of the nasopharynx; an omission which, as I have pointed out elsewhere, is not uncommon when the adenoid operation is done by surgeons other than specialists. It is, moreover, a serious omission from the otological point of view and contributes considerably to the discredit which is attached by some to the removal of adenoids.

The later effects of the non-removal of adenoids or of the neglect to clear thoroughly the fossæ of Rosenmüller is well shown in Fig. 4, from a man, aged thirty-two. I have found that adhesions in Rosenmüller's fossæ, such as are seen here, a fairly common condition in catarrhal middle-ear deafness in young adults. With it goes a history which points to neglected adenoids in childhood, often accompanied by recurrent attacks of earache. These adhesions are probably the traces left by adenoids which have retrogressed and that they seriously hamper the normal movements of the Eustachian tube can be seen through the nasopharyngoscope. Under favourable circumstances, the removal of these adhesions results in improvement in the hearing.

The case depicted in Fig. 5 reveals the action of enlarged posterior ends of inferior turbinates upon the Eustachian tube. This picture was taken from a woman, aged thirty-three, who had middle-ear deafness on the left side, with a septum badly deflected to the right. A large posterior end of the left inferior turbinate was seen in the foreground, with the Eustachian cushion swollen, somewhat darker in colour than the one on the opposite side, and granular. This appearance is probably due to the continued irritation of the secretions poured out by the glands of the posterior end of the turbinate, which share in its hypertrophy.

In acute and subacute middle-ear deafness arising during an acute

Eustachian tube; female, aged thirty-two.—FIG. 5. Large hypertrophy of posterior end of left inferior turbinate; the Eustachian cushion is swollen and of granular appearance; female, aged thirty-three.—FIG. 6. Left Eustachian cushion swollen and congested; mucus flowing from the lumen; male, aged thirty-one.—FIG. 7. View of posterior nares; a large posterior spur blocks the left, a small part of a posterior end hypertrophy peeping over it. On the right is a large posterior end hypertrophy, with a slightly similar condition of the middle turbinate; female, aged fifty-two.—FIG. 8. Large post-nasal polypus nearly filling space; female, aged twenty-five.—FIG. 9. View of right nasal cavity from about the middle; the tube of the instrument lay on the nasal floor, the lamp and prism upwards. To the right of the picture is seen from below an inferior septal spur; to the left the smooth inferior turbinate, with the middle turbinate showing above it; male, aged sixty-two.—FIG. 10. View of right nasal cavity, showing three small polypi growing from under the edge of the middle turbinal, about its centre; male, aged forty-five.—FIG. 11. View of anterior part of right nasal cavity, showing a small polypus at the entrance of the frontal sinus; the polypus showed very white compared to the pinkish colour of the nasal mucosa; female, aged seventeen.—FIG. 12. Mucopus escaping from the right maxillary sinus, beneath the middle turbinal; female, aged thirty. FIG. 13.—Drop of pus issuing from right sphenoidal opening; male, aged forty-three.

nasal catarrh, swelling and congestion of the Eustachian cushion may often be seen, sometimes symmetrical, sometimes unilateral; in the latter case, one cushion may be swollen to nearly double the size of the other. Fig. 6 is an interesting picture, because it depicts the condition seen in a case of acute catarrh with fluid in the tympanum. The patient, a man, aged thirty-one, showed the dark, curved line across the tympanic membrane indicative of this condition, uncommon in England. With intent to endeavour to relieve him without incising the membrane, I used the Eustachian catheter and, following its passage, inspected the nasopharyngoscope with Holmes's instrument. The Eustachian cushion was twice the size of its fellow, and issuing from the lumen was a drop of moderately viscid mucus, which I was able to wipe away with a cotton carrier passed through the opposite nostril. A myringotomy was not required.

Not the least use of the nasopharyngoscope is that by its means applications can be made directly to the Eustachian tube and other parts of the nasopharynx, or, in difficult cases of catheterisation, one can direct the beak of the catheter by vision.

Before leaving these brief references to the Eustachian tube, I would point out that, in some cases accompanied by flaccidity of the tympanic membrane, an undue patency of the ostium of the tube may be noted.

Fig. 7 shows a view of the posterior nares drawn from a sketch made with the Holmes's nasopharyngoscope in position. Of course such a picture has to be made whilst the instrument is turned in different directions. Pictures obtained with the posterior rhinoscopic mirror are very made up in character, but those afforded by the Holmes's instrument are much more continuous; they are made more on the panoramic principle, if one may so term it, than by piecing together glimpses of a more or less passing nature. The picture in Fig. 7 was made from a lady, aged fifty-two, who suffered from chronic nasal and post-nasal catarrh, with nasal discharge and continual "dropping of mucus" behind the soft palate. She was the subject of dyspepsia and was always catching cold. This case especially shows the value of the nasopharyngoscope, for anterior rhinoscopy showed very little beyond small inferior ledges to the septum and swollen middle turbinals. Under cocaine, a doubtful bulging of the septum at the back of the left nasal cavity was suggested rather than seen. Posterior rhinoscopy was unsatisfactory. With the nasopharyngoscope, the doubtful septal appearance resolved itself into a marked bony spur blocking the left choana, a fragment of hypertrophied posterior end peeping over its upper edge. The right choana was blocked by a large hypertrophy of the posterior end of the inferior turbinal. By no other means (save, perhaps, imperfectly by digital examination) could the real condition of the nose have been made out.

The picture shown in Fig. 8 is that of a large post-nasal polypus, nearly filling the nasopharynx, in a woman, aged twenty-five.

Examination of the Nasal Cavity.—By slowly withdrawing the instrument along the floor of the nose and turning the beak in different directions, very good pictures may be obtained of the interior of the nose. The advantage of this method is that different parts of the cavity can be brought directly under the eye. I have selected a few sketches which may give some idea of the pictures thus obtained,

though I fear that pen and ink furnishes but inadequate means of conveying to a reader the majority of the views afforded by the naso-

pharyngoscope. Colour pictures are better, but even these fail as representations of the actual thing, and nothing but practice in endorhinology can bring a true appreciation of its value, especially in the diagnosis of doubtful cases. As an instance, I would cite the following:

A lady, aged twenty-nine, was twice operated upon for empyema of the right maxillary antrum in January, 1915, and May, 1916, the cavity being reported as full of polypi on both occasions. In December, 1916, she had pneumonia. Recently she had suffered with indefinite symptoms referred to the nose, and probably of vasomotor origin. A further operation (? removal of upper jaw) had been suggested, and my opinion was sought in confirmation. Examination was negative. The nasopharyngoscope was used, and, as a liberal opening had been made into the antrum under the inferior turbinal, the instrument was introduced into the antrum through the hole. The cavity was quite empty, save for a little mucus, and no single granulation could be detected.

On an earlier occasion I was able similarly to explore an antrum that I had myself operated upon, and in that case the Holmes's instrument showed me a small polyp in the anterior inferior angle.

Fig. 9 gives some idea of the picture obtained in a man, aged sixty-two, by endorhinology with the instrument upon the nasal floor, and the lamp and prism directly upwards. The right cavity is under examination. On the right of the picture is seen a large crested inferior septal deviation, under which the instrument is partly lying. On the left the edge of the inferior turbinate appears, that of the middle turbinate showing above it. The higher regions are in shadow, but, in many cases, a gentle depression of the proximal end of the instrument will raise the distal lamp sufficiently to illuminate the upper part of the cavity.

In Fig. 10 a view is shown from about the same spot; also in the right nasal chamber. In this case, however (a man, aged forty-five), the septum is straight. Below the junction of the anterior and middle thirds of the middle turbinate can be seen three small polypi. These polypi were not visible by anterior rhinoscopy.

Fig. 11 shows the anterior part of the right nasal cavity of a girl, aged seventeen, and, as in Fig. 10, plainly indicates what could not be seen by anterior rhinoscopy, viz. the passage leading to the frontal sinus, with a small polypus growing therefrom. This is especially a picture which loses by not being in colour, as the polypus showed very white against the pinkish colour of the mucous membrane.

The same may be said of Fig. 12, which shows the right nasal cavity, about the middle, in a woman, aged thirty. Mucopus is seen escaping from the right maxillary antrum. It flows over the inferior turbinate from under the swollen, irregular edge of the middle turbinate.

Holmes, in his first description of his electric nasopharyngoscope (*Annals of Otology, etc.*, xx, 29), mentions that "in several cases we have seen pus dropping through" the opening into the sphenoidal sinus. I have been able to note this condition on one occasion only, shown in Fig. 13, in the case of a man, aged forty-three. The sphenoidal opening is not by any means easy to make out.

I trust that these brief notes may be sufficient to stimulate others to make trial of endorhinology. Possibly some of our younger rhinologists will take up the subject and make valuable additions to its practice. I know of one of the older generation who realises its value.

Personally, I am of opinion that endorhinoscopy has potentialities worth developing, and that it will become as much a routine examination among specialists as inspection with an ordinary speculum through the anterior nares.

PRIMARY TUBERCULOSIS OF THE FAUCIAL TONSILS IN CHILDREN.¹

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(Report to the National Medical Research Committee.)

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THE primary localisations of tuberculosis is still a much vexed question, especially in regard to the relative frequency in which infection takes place through the alimentary and respiratory tracts, and also in what way the primary focus becomes the source of subsequent secondary and more generalised infection. The object of this research was not to consider so extensive and important a subject in its entirety, but to ascertain the frequency of primary tuberculosis of the faucial tonsils and its connection with other tuberculous affections, more particularly with the frequent involvement of the cervical lymph nodes.

Whilst much has been written upon secondary tuberculosis of the tonsils, where phthisical patients have infected their tonsils by their own sputum, the primary form of the disease has hitherto received little attention. Many of the best known text-books in surgery and diseases of the throat and nose either do not refer to tuberculosis of the tonsils at all or treat it as of rare occurrence. The opinion most generally held by clinicians is that the primary form of the disease is of rare occurrence. The reason is probably not far to seek, in that the tuberculous tonsil seldom causes symptoms apart from secondary infection of the cervical glands. Pathological results have also differed greatly in the number of instances in which tuberculous lesions in the tonsils have been found. This variance is due partly to the fact that some give *post-mortem* reports, whereas others detail the results of the examination of tonsils removed during life. The conclusions drawn from such observations must necessarily be one-sided. It appears, therefore, that there is need of additional statistics relating to the subject.

The present investigation formed part of my study of tuberculosis of the cervical lymph nodes reported on in the *British Medical Journal*, London, 1914, vol. i, p. 125, and essentially is concerned with material derived from surgical operations. During the period 1910-16 the material was obtained in the routine of hospital practice. I am particularly indebted to Mr. Harold J. Stiles and Mr. C. Balfour Paul, late Assistant-Surgeon to the Royal Hospital for Sick Children, Edinburgh, and also to Drs. Logan Turner and J. S. Fraser, of the Royal

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² From the *Journal of Pathology and Bacteriology*, vol. xxi.