about a quarter of my material. The operation seems entirely free of danger, and no such case has ever given me any anxiety.

The bulk of the cases—more than half my material—presented the disease in a severe form, the symptoms being marked as well as the physical signs and the goitre well developed. In such cases the improvement seems to vary with the amount of thyroid removed, and in about half of them is permanent and more or less complete. A second operation may be necessary because of a residuum of symptoms being left or because a recurrence takes place. I am inclined to say of this class that at least half can be permanently cured, though some need a second operation to secure this result. Of the rest, the disease can be greatly relieved or brought to a standstill in most.

Anything more detailed than this rough analysis would not, in my estimation, at the present time be of much value, but I should like to add that I am deliberately giving cautious and conservative estimates of the results.

To turn for a moment to the more technical aspects of the subject I should like to add a few words as to anæsthesia and technique of operating. I have used chloroform, open ether, ether by intravenous infusion, and local analgesia.

There seems to be a strong current of feeling at the present day against the use of chloroform in these cases, and I must admit that I have been influenced by it. There can be no doubt that the drug is more toxic than ether, and I feel that we are not justified in adding any risk, however small, to those necessarily contingent upon the operation. Still, I should like to say that in all my earlier cases chloroform was used and gave satisfactory results in some of the severest. The pulse-rate practically always diminished during the anæsthesia. Of course, such an anæsthetic should never be given except by the most accomplished expert, and I was fortunate in having for the most part the assistance of my friend Dr. Herbert Scharlieb. Ether by infusion I do not regard as presenting any considerable advantage except possibly in the elderly where pneumonia is to be feared.

At present I rely entirely upon ether by the open method in combination with atropine, morphia, and scopolamine, and in certain cases upon local analgesia. In connexion with the use of ether I should like to lay stress upon the importance of the preliminary atropine and upon the anæsthetist satisfying himself that this drug is acting before he begins the anæsthetic.

With regard to the actual operation, the choice of the time for its being done is in my opinion very important. I do not, however, acquiesce in the view that has been expressed that the patient should be submitted to several months' medical treatment as a preliminary. After all, this merely means watching the course of the disease for such a period, and I think that after some experience one can estimate the type of the disease and the course it is likely to follow without an expenditure of time so discouraging to the patient. As to the existence of an acute exacerbation, I should not hesitate to operate at such a time if I thought the patient's life was being endangered by the condition, though as a general rule it would be better to wait. Bronchitis, tonsillitis, and acutely inflamed cervical glands which are common complications I regard as absolutely contra-indicating operation for the time.

I have come to regard the mental state of the patient as perhaps the most important feature of the case in prognosis both as to the danger of operation and as to the final result. All the patients are nervous—that is, of course, part of the disease; but not all are frightened, and the really frightened patient is the most dangerous of all. To explain this, I do not think it necessary to invoke the changes in the cerebral cells of frightened animals described by Crile. A much simpler explanation seems to me available. Fear acts by precipitating an access of tachycardia during which the pulse-rate is perhaps uncountable for hours. In such circumstances the anæsthetic does not produce the usual steadying of the pulse, and the shock of the operation or the least amount of cyanosis from laryngeal spasm may be fatal. It is in these cases that the modern method of ether administration is so valuable. In hospital nowadays in my cases the patient is always anæsthetised in bed in the ward.

In the actual operation itself speed is no doubt valuable, but it is much less important than gentleness of manipulation which is absolutely indispensable. A large incision is essential to give easy access to the gland, and any kind of

pulling is to be strictly avoided. In getting out the upper pole traction is very easily transmitted to the superior laryngeal nerve with the immediate result of causing laryngeal spasm and cyanosis—a most dangerous complication. Drainage is sometimes necessary when the anæsthetic is ether, to allow of the escape of blood. Otherwise I never use it, and I have not seen the slightest evidence that the thyroid secretion can cause symptoms by being absorbed from the wound.

The operation done in my cases has always been a partial thyroidectomy, usually the removal of one lobe and the isthmus.

The chief causes of death are shock during or immediately after the operation, an exacerbation of the disease within the next 24 hours, or pneumonia in the first week. I have lost two cases from shock, one from an acute exacerbation and one from pneumonia, and I am convinced by the study of that experience that the danger of the occurrence of such complications can be greatly reduced. This is to be effected by adequate mental and physical preparation of the patient, the choice of the best time for operating, the right anæsthetic for the given case, and the most careful avoidance of any traction upon or crushing of the gland. Such conclusions have been entirely borne out by my later experience.

Harley-street, W.

"ACHING THROAT."¹

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IT is known to us all that there are certain affections of everyday occurrence which, while not having the immediate destructive effect upon life which appertains to the various forms of malignant disease, yet in a way have considerable importance, since by their persistent character and worrying nature they, as it were, gnaw their way into the comfort and happiness of their unlucky victims, constantly obtruding themselves on their consciousness and interfering with their pleasures like spectres at a feast. To one of these I have given the name of "aching throat," and I have decided to submit to your notice and consideration a few facts concerning it, because, although from childhood upwards we are all familiar with "sore-throat," yet aching throat, although more troublesome because more permanent, has not, I think, for some reason received the amount of attention it deserves.

The patients who come complaining of this trouble have generally arrived at, or are approaching, middle life, and the aching may vary very considerably in degree and somewhat in character. On examination they may be found to have the signs of chronic pharyngitis, with swelling, congestion, and catarrh, hypertrophy of the pharyngeal bands and granular patches, associated with coughing, hawking, and other efforts, varied and anomalous, some voluntary, others reflex, to clear the throat. Also there may be associated with it enlargement of the post-nasal, faucial, and lingual tonsils, the first least, the last most commonly, or nasal obstruction and discharge, also enlarged veins, bad teeth, and enlarged glands. All of these I have observed, but not one of them is pathognomonic, for in some of the worst cases one comes across they are absent. It is a somewhat curious fact, at least as far as my experience goes, that those cases of pharyngitis with swollen deeply congested pharynx, soft palate and uvula, with great irritability and excess of mucus, such as one sees often in persons indulging in excess of alcohol and tobacco, are but seldom troubled with aching throat, though dryness may be a marked symptom, and, on the other hand—indeed, in some of the worst cases—I have seen the pharynx when examined show very little or no evidence of disease at all.

As regards general condition, these patients are sometimes anæmic or their history or other parts of the body point to gouty or rheumatic tendencies; much more commonly, however, the patient suffers from dyspepsia of the flatulent variety which may have to be carefully inquired into, for if simply asked whether or no he suffers from indigestion the patient generally replies in the negative, as he has neither abdominal pain nor vomiting, but is distended with wind,

¹ A paper read before the Medical Society of London on Feb. 12th, 1912.

the belching up of which gives him considerable relief. In taking the history of these patients it is necessary to carefully analyse their feelings, or one of the cardinal signs may not be elicited—viz., that the aching, instead of being increased by swallowing food, as is the case in sore throat, is diminished thereby, as though the bolus in some way soothed and comforted the parts; swallowing liquids, however, may increase the aching.

In trying to throw some light on this symptom of aching throat, it will be well to first shortly consider two points—viz., the nerve supply to the naso-pharynx, pharynx, and upper part of œsophagus, and the vagueness of the sense of locality in this region.

Briefly taking the nerve supply first:—From above downwards, we find the posterior and external branches of the spheno-palatine ganglion of the superior maxillary together with the pharyngeal nerve and Vidian; the inferior maxillary by its various branches sensory and motor, the facial to certain muscles used in swallowing, the glossopharyngeal by numerous branches both muscular and to the mucous membrane, the pneumogastric, together with the spinal accessory, pharyngeal and laryngeal branches to mucous membrane and muscles of the throat, also to the external auditory meatus and œsophagus; the hypoglossal to the muscles of the pharynx, also the upper cervical spinal nerves and the sympathetic.

As regards sense of locality, one notes in the naso-pharynx and pharynx a vagueness which may be misleading. For instance, when one passes the Eustachian catheter through the nose in the ordinary way for deafness, and the point impinges on the orifice of the Eustachian tube above the palate, the patient is apt to point to a spot below the angle of the jaw and say that he feels it sticking in there. Again, this vagueness is well illustrated by the common incident of one's having to search for a bone sticking in the throat when the foreign body is generally found in quite a different part from that to which the patient had drawn our attention.

Also, how often we find pain due to disease of the throat referred to the ear. And patients suffering from malignant disease of the lower end of the œsophagus sometimes refer their discomfort to the cervical region, and I myself have had a case in which the chief symptoms were aching and unpleasant sensations referred to the throat and wasting. In this woman examination of the pharynx and œsophagus by the direct method showed nothing abnormal, but the patient died with disease of the liver.

I think, therefore, we may say without fear of contradiction that we have in this region not only an exceedingly rich and varied nerve-supply, but also find here a marked tendency to refer sensations to other areas than those actually stimulated.

One would like first to mention here that one knows very well that there are those who are inclined to somewhat poo-poo these cases and dismiss them under the general term "neurotic," and consider the aching allied to the constricted feelings of the throat and the lump rising or globus hystericus of true hysteria, but I cannot admit this explanation as satisfactory, for although aching throat may, of course, occur in a neurotic subject, and this explanation is apt to cross our minds if we find nothing locally, yet in the great majority of cases further examination fails to reveal other signs of hysteria.

Again, I would disassociate from the subject under discussion the aching pain felt by those who use their voices largely, such as teachers, clergymen, lecturers, public speakers, singers, and the like, and in whom it is associated with more or less hoarseness, as this seems allied to the so-called muscular aching from which many persons suffer after the immoderate use of any muscle in the body, leaving aside the question as to whether the pain be actually in the muscle itself or not; for aching throat occurs commonly in those who are not large voice users at all. On the other hand, they often complain that the aching is much worse when they get tired, using the term in the general sense. Here are some short notes of illustrative cases, private and hospital.

CASE 1.—The patient, a domestic servant, aged 34, attended hospital complaining of aching throat. She had six months previously suffered from tonsillitis, but volunteered the statement that this was quite a different pain from that which she had then, and noticed that taking food, instead of aggravating it as it did before, now gave temporary relief. On examination the throat looked anæmic, but beyond a slight enlargement of the faucial tonsils nothing else abnormal could be detected. Bowels very constipated. After advice as to diet and

regulation of the bowels marked improvement took place, and patient ceased to attend.

CASE 2.—A healthy looking man, aged 40, came complaining of discomfort in the throat which he described as being of an aching and burning character. Asked as to its position he located the site of maximum intensity as being about the situation of the thyroid cartilage, but sometimes extending up to the ear and down to the sternum. On examination it was noted that the teeth were very much decayed and some granular patches present on the pharyngeal wall. Post-nasal space normal. Subsequently an examination by the direct method was made, but no abnormal appearances could be detected in the lower part of the pharynx or œsophagus. He suffered largely from flatulence, and belching gave some relief to the pain. No pain or difficulty in swallowing solid food, which gave immediate temporary relief. Liquids, however, he stated seemed to increase his discomfort. Advised to seek the assistance of a dentist and ordered a mixture containing rhubarb and soda. Reported later that he had been better for a time, but that the pain had returned. The granulations on the pharyngeal wall were now cauterised with the galvano-cautery, and when last seen he was free from the aching.

The next case does not, strictly speaking, belong to this category, but is introduced because of the side light it throws on the subject.

CASE 3.—A man, aged 45, came complaining of pain in the throat, sometimes of an aching, sometimes shooting in character, the seat of maximum intensity being in the region of the lesser cornu of the hyoid bone on the left side. No pain on swallowing, no symptoms of indigestion, no flatulence. Patient had previously tried numerous remedies and had the galvano-cautery applied to the pharynx, but the aching, though intermittent, never disappeared. On making a careful examination of the floor of the mouth I found a small salivary calculus in Wharton's duct, after the removal of which the pain permanently disappeared.

Since this occurrence I have made a point of examining carefully the floor of the mouth in all cases of aching throat, but in only one other case—viz., that of a lady about 50 years of age—have I ever succeeded in detecting anything in the shape of a salivary calculus.

CASE 4.—A man, 52 years of age, who had been abroad a good deal and had had malaria, complained of aching and throbbing feelings in the throat, and referred to the back of the palate as the seat of its maximum intensity, but he was somewhat vague on this point. He admitted that he suffered from indigestion and flatulence. On examination of the mouth and pharynx nothing abnormal was detected, nor did posterior rhinoscopy reveal any abnormality, though the airway through the nose was much interfered with by a deviated septum. The bowels were regulated and the indigestion treated with partial relief. Later on the nasal stenosis was relieved by a submucous resection operation, after which he expressed himself as feeling all right and ceased to attend.

CASE 5.—A housewife, aged 52, came complaining of trouble, some aching in the throat. She was very much worried by the pain, which she feared was due to cancer, from which her mother died. She swallowed food very slowly, and believed that certain articles of food made the pain worse afterwards, but she had no real difficulty in getting a bolus down. She got much flatulent distension and belching after food. Lingual tonsil enlarged but no other abnormality detected, nor did the direct examination of the œsophagus by means of Brüning's apparatus give evidence of anything pathological. Aperients and regulation of the diet produced improvement, but the case has shown marked relapsing tendencies.

Treatment.—I have already spoken of the local pathological conditions which I have found at different times associated with aching throat, but except, of course, in such a case as calculus I would strongly advise the avoidance of radical treatment in reference to these in the first instance; I think it better to be content with the ordinary cleansing nose washes, sprays and gargles containing chloride of sodium, bichlorate of sodium, and the bicarbonate, boric acid, potassium chlorate, and the like, for operation may prove disappointing in results both to surgeon and patient, and should therefore not be lightly undertaken nor advised since we cannot promise that removal of, say, a much enlarged lingual tonsil will cure aching throat, any more than the removal of polypi and other morbid conditions in the nose can be guaranteed to cure asthma.

At the same time one must give proper attention to general pathological conditions such as anæmia, though I must admit that the administration of arsenic and iron after due regulation of the bowels has not given the results hoped for as regards the throat discomfort, but has, in fact, been decidedly disappointing. I must say the same though in a less degree as regards medicines which have been found to give relief in gouty conditions—e.g., colchicum, piperazine, and salts of lithium and potassium, such as the citrate and bicarbonate.

As regards rheumatism, the fact that the pain closely resembles that which occurs in muscular rheumatism, and also since it has been repeatedly shown not only that acute pharyngitis and tonsillitis are often markedly benefited by anti-rheumatic remedies such as salicylate of soda and aspirin, but also that these diseases are often the immediate forerunners of acute rheumatism, one would be led to reasonably expect that these remedies would give relief in aching throat, but they have failed to do so in my hands.

On the other hand, a very large proportion of patients do

suffer, and have suffered, from chronic dyspepsia, and the appetite is commonly deficient, though occasionally it is the opposite. Although actual abdominal pain and vomiting are not common, retching frequently occurs with feelings of oppression and depression after food and eructations and distension with gas. The tongue may present morbid appearances, and a disagreeable taste is often present. Constipation is very common, diarrhoea rare.

What the exact relationship of aching throat is to this condition it is difficult to say, but that it is a very close one I am quite certain, and the best results are to be obtained by suitable treatment to the digestive organs, supplemented in some cases by operative treatment on the throat and nose.

In order to relieve the dyspepsia, first of all the teeth must be examined, and the patient referred to a good dentist if necessary. The diet must be inquired into and corrected. As regards the vexed question of alcohol, it certainly seems in some cases to bring on and in others to aggravate the aching, and I think, on the whole, these patients are better without it. I know of several cases in which washing out the stomach has completely relieved the aching, and consider it a most valuable form of treatment if not carried to excess.

Amongst the drugs which have proved most useful, gentian, calumba, strychnine, bicarbonate of soda, bismuth, magnesia, and charcoal are the principal. Constipation is very common and very troublesome, and if not relieved by careful dieting I have found the best drugs to use to be cascara, podophyllum, and sulphur; also small doses of mercury followed by a saline aperient are valuable. As a means of giving temporary relief massage is useful, and so is the galvanic current, but as permanent curative agents both are disappointing.

Smoking, if in excess, of course must be forbidden, but I have not been able to convince myself that moderate smoking was in itself a cause of aching throat, and certainly many women suffer from it who do not smoke at all, and one finds a good many patients who are anxious to get well and willingly abstain entirely from both tobacco and alcohol, and yet the pain continues.

In conclusion, to summarise matters a little we may say that experience has shown that aching throat is more commonly associated with flatulent dyspepsia than anything else, and this seems to act either by the formation of toxins, or possibly the aching may be a referred pain, such as that which occurs in the ear so commonly in disease of the larynx and upper part of the oesophagus. There may also, however, be local conditions which, if they do not actually cause, certainly accentuate aching throat; these must be sought out and dealt with in obstinate cases, not forgetting that the condition of the nose and accessory sinuses has a very distinct bearing on the state of the pharynx, as also have the teeth.

I will finish with one word of warning—viz., only after very careful examination must we arrive at our conclusions as to the cause of aching throat. To overlook malignant disease is disastrous.

Cavendish-place, W.

FURTHER EXPERIMENTS ON THE TREATMENT OF INOCULATED RAT SARCOMA AND OBSERVATIONS ON CERTAIN ACCOMPANYING BLOOD CHANGES.¹

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AND

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IN a previous communication² we published the results of some experiments on the treatment of malignant disease in rats and mice, showing that by the injection of antivenom (horse) serum it was possible to effect regression of inoculated tumours in rats provided they did not exceed 1.5 cm. in diameter. We have found since that by the simultaneous administration of adrenalin with the antivenom serum (Pasteur Institute) yet larger growths can be made to disappear in these animals.

In this second series of 77 tumours there have been many which reached or exceeded 2×1 cm. in size. An idea of the relative size of such a tumour may be gained from the fact that the average weight of the animals used has been 40 grammes, and of the tumours 8 grammes—that is, a tumour equal to one-fifth of the body-weight may be cured.

Of these 77 tumours, 34 of the largest at the time of starting the experiment have been treated, while 43 were kept as controls. Of the 34 treated, 24 were cured, 3 became larger, while in 7 the animals died before the conclusion of the experiment. Of the 43 control tumours, only 8 regressed, the remaining 35 increased in size, while 12 animals died before the conclusion of the experiment. In other words, while 70 per cent. of the treated tumours regressed, only 18.6 per cent. of the untreated tumours did so, although the original selection of small tumours as controls placed them in a more favourable position for regression. Consequently there can be no doubt as to the effect of treatment. Moreover, in the untreated animals metastatic deposits were common, but in none of the animals which died while still under treatment were any metastatic deposits found.

There is a marked naked-eye difference between a treated and an untreated growth. The treated tumour is composed mainly of a necrotic core with only a narrow margin of tumour tissue proper. The width of this bounding layer depends upon the size of the tumour and the duration of the treatment. Of course, necrosis occurs also in the centre of many untreated tumours, but growth continues at the margin, so that there is always an increasing area of tumour tissue in growing tumours.

The facts mentioned above and in our previous communication, made it likely that there would be some difference in the hæmolytic content of the blood against cobra venom in susceptible and refractory animals respectively. We find that the anti-hæmolytic power of tumour-bearing rats is considerably less than that of refractory animals. Further, in uninoculated animals, it is possible by an examination of the anti-hæmolytic power of the blood to foretell with a considerable degree of accuracy whether on inoculation with sarcoma they will or will not "take." The method of our procedure will be given in detail in another paper, but we may mention here that inactivation of the serum to be tested is essential. Conversely, by diminishing the anti-hæmolytic power of otherwise refractory animals it is possible to render some of them temporarily susceptible—in one instance even after ten previous unsuccessful inoculations with the same tumour.

In the human subject the results are not so unequivocal. Infective conditions seem often to be accompanied by a considerable loss of anti-hæmolytic power to cobra venom, and all we can say is that serum from cases of sarcoma also assists hæmolysis, while that from normal individuals tends to inhibit it. This similarity with infective conditions may have a suggestive significance.

To summarise: 1. By an extension and modification of

¹ Part of a paper read before the Leeds and West Riding Medico-Chirurgical Society on Feb. 16th, 1912.

² THE LANCET, April 1st, 1911, p. 879.

CENTRAL MIDWIVES BOARD.—A meeting of the Central Midwives Board was held on Feb. 22nd, at Caxton House, Westminster, with Sir Francis H. Champneys in the chair. Letters were considered from the superintendent of the Rescue and Maternity Homes, Moss Side, Manchester, and from Dr. C. W. Brown, of Manchester, asking that candidates whose certificates of attendance on cases and attendance during the lying-in period are not signed in accordance with the existing Rules may nevertheless be admitted to the next examination. The Board decided that the superintendent of the Rescue and Maternity Homes and Dr. Brown be informed that the candidates cannot be admitted to the examination, their schedules not having been signed in accordance with the Rules. Letters were considered from Dr. W. J. Howarth, county medical officer of Kent, reporting the suspension of two midwives for a period in excess of 24 hours, with the special circumstances in connexion with the cases. The Board directed that Dr. Howarth be thanked for his communications, and that he be informed that the action taken is approved by the Board. A letter was considered from a certified midwife inquiring as to the antiseptics to be used for cleansing the infant's eyelids as prescribed in Rule E, 2 (b). The Board decided that the reply be that the Board has designedly refrained from prescribing the use of specific antiseptics.