leaving the entire wound open, as Mr. Butlin and others recommend (von Bergmann's operation). The stomach may be washed out after the oesophagus has been sutured, so as to diminish the likelihood of post-anaesthetic vomiting. The stomach tube passes readily.

The post-operative treatment is also important. In any future case I shall certainly carry out a similar line of post-operative treatment to that adopted in this case—namely, the avoidance of all nourishment by the mouth for four days, frequent rinsing of the mouth and pharynx with an antiseptic mouth-wash, and rectal administration of salines with raw meat juice. It may be said that as the patient is constantly swallowing saliva he will be no worse off if allowed to take liquid nourishment; but I think less strain will be thrown upon the oesophageal wound by simply leaving the patient to swallow saliva than by giving milk and other liquid nourishment to drink.

Some authorities recommend preliminary gastrostomy a couple of weeks before removing the diverticulum, with the object of increasing the patient's strength before operation and of being able to feed him from the first without running any unnecessary risk of producing leakage of the oesophageal wound. In greatly emaciated patients badly exhausted by inanition, such a preliminary operation under cocaine anaesthesia should unquestionably be performed, but in cases not so exhausted it is unnecessary.

The removal of the diverticulum itself could easily be accomplished under local anaesthesia, and the patient given a satisfactory meal through the stomach tube passed before the neck wound is closed and while the sutured oesophagus is still under the operator's eye.

Passing a tube through the mouth into the stomach or oesophagus, and leaving it in position so as to feed the patient subsequent to the removal of the pouch, is a procedure to which I should not have recourse.

REFERENCE.

¹ *Annals of Surgery*, October, 1908.

Remarks

ON

COMMON TYPES OF SORE THROAT.*

BY A. STANLEY GREEN, M.B., B.S.,

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SORE throats present considerable difficulties both in diagnosis and treatment, and are amongst the most anxious cases that the medical man is called upon to treat in his practice, especially amongst children, for when a child complains of a pain in the throat the mother is filled with anxiety, sends for the doctor, and her first question is, "What is it, doctor? Is it diphtheria?" and the doctor is expected to give it a name forthwith. Now, in some cases this is an easy matter, but in a large number the diagnosis presents many difficulties, and the cautious man will exercise reserve in giving a definite opinion.

Scarlet Fever.

I do not propose to enter into any details with regard to the differential diagnosis of the acute specific infectious diseases from the appearance of the throat; so many other circumstances have to be taken into consideration with which you are all more familiar than I am, for my practice does not lie in that direction. I often hear the expression, "He's got a typical scarlet fever throat"; but there are four different conditions of sore throat met with in scarlet fever.

1. The tonsils, faucial pillars, palate, uvula, and oropharynx are swollen and of a deep red colour. Sometimes there is inflammatory oedema. (This picture was exactly reproduced in all the throats in our milk epidemic, and many cases were isolated, the isolation being strictly enforced until the patient had finished peeling; in all my

cases the oedema was very marked, and the submaxillary glands were involved very early and to a considerable extent.) I have also seen several throats this spring which presented the same appearance, but they were due to influenza; but in these patients the glands were not affected, but a very troublesome cough annoyed the patients, especially at night, and caused a sharp cutting pain in the larynx, which, however, on inspection was found to be normal, but the mucous membrane of the trachea was the seat of inflammation. I found that glyco-heroin acted as a specific for the cough, and the pain was relieved by benzoic acid lozenges sucked freely.

2. The appearance presented may be that of a follicular tonsillitis.

3. A definite membranous inflammation may occur; the membrane is soft, and leaves superficial ulceration as it disintegrates.

4. Marked and deep ulceration occurs in the septic variety; the ulceration may spread upwards to the nasopharynx and nose and downwards to the epiglottis and larynx; the soft palate may be perforated or the uvula may slough off.

The treatment of the throat symptoms in these diseases merits more attention than is usually paid to them; a gargle is frequently ordered, which many patients, especially children, are unable to use, and in any case the fluid seldom reaches the oropharynx; it is far more efficacious to prescribe a lozenge—for example, formamint—or apply whatever fluid is chosen with a brush; this the physician should do once a day himself, because parents, and indeed many trained nurses, are unable to carry this out efficiently, and more is deposited on the surface of the tongue than reaches the inflamed area. I find it better in many cases not to depress the tongue with a spatula—this causes the patient to hawk and retch; if the patient is directed to open the mouth wide and take a deep breath, the tongue sinks down, and the brush can be passed in rapidly, and the whole area thoroughly swabbed. Inasmuch as the inflammation in a large percentage of cases extends upwards through the Eustachian tubes to the middle ear, causing acute otitis, it is always advisable to douche the nasal cavities; personally I never use a spray, as they are inefficient, easily get out of order, and frighten a nervous child. I find the glass douche the easiest to use, and a warm alkaline solution the most efficacious in clearing away the mucus and freeing the nasal passages.

Diphtheria.

I need not say much about diphtheria; the only question is one of early diagnosis, and the prompt injection of serum in efficient doses. The diagnosis is often attended with difficulty, especially when the membrane is confined to one or both tonsils; indeed, when I was a student I was taught that such cases were not diphtheria, but I have seen several cases in which only one tonsil was covered with membrane, but bacteriological examination revealed the specific organism; these cases are very important, because many of the patients are well enough to walk about, but at the same time are sources of infection to their comrades, and may themselves suffer from subsequent paralysis. The injection of serum is sometimes followed by very unpleasant symptoms.

I had a case lately where I injected 3,000 units of anti-diphtherial serum, and in less than ten minutes the patient's eyelids commenced to swell and this swelling involved the whole of the face in less than one hour; the lips were as thick as a negro's, and the whole body was covered with an urticarial eruption which caused the patient intolerable irritation. I remembered that I had treated her six years previously for hay fever, and that one of her sisters had suffered from chilblains, so I prescribed 20-grain doses of calcium chloride every two hours, with the result that in fourteen hours all the swelling had disappeared from her face and only small areas of eruption were causing any irritation.

Vincent's Angina.

Vincent's angina is a condition met with more commonly than is generally supposed. There are two varieties, but only the ulcero-membranous presents any interest for us; the diphtheroid is extremely rare. The more common type is ushered in by headache and fever with redness of the fauces and enlargement of the tonsils; the breath is fetid, tongue coated, and the submaxillary

* A paper read before the Boston and Spalding Division of the British Medical Association.

glands swollen and tender; deglutition is attended with difficulty and pain. The attack may subside in a week or ten days, or may persist and become chronic; in some cases ulceration of the tonsils and palate may occur. In one case of mine both middle ears had become infected before I saw the case, and both the fusiform bacillus and spirillum were found in the pus. When a grey or yellow membrane has formed on the tonsils and palate it is difficult to diagnose the case from diphtheria or streptococcal infection without a bacteriological examination.

Streptococcus Infection.

One of the most serious conditions of sore throats that we are called upon to deal with is acute streptococcus infection, which may simulate diphtheria very closely, but the diagnosis is cleared up by taking a swab. If seen in the early stage only one tonsil may be affected; it is swollen and red and covered with a yellowish membrane which is difficult to remove, and the surface of the tonsil bleeds when the membrane is removed; the patient's breath is offensive, tongue coated, temperature high (sometimes 106°), and pulse rapid; very soon the other tonsil is affected, and the palate may or may not be swollen. I have seen a case lately where both tonsils and their pillars were acutely inflamed and covered with thick yellow membrane, whilst the palate and uvula were unaffected; the patient feels miserably ill, is with difficulty persuaded to take food, and, if the swelling increases and invades the epiglottis and larynx, respiration becomes impeded, and the patient may be in imminent danger; it may be necessary to scarify the swollen parts or perform tracheotomy. The glands behind the angle of the jaw are affected from the commencement and may form a swelling the size of a Tangerine orange in less than forty-eight hours. Culture from a swab will give either a pure growth of *Streptococcus pyogenes aureus* or a mixed growth of *Staphylococcus* and *Streptococcus*. I find it best to give 5 to 10 c.cm. of polyvalent serum (P.D.), and I swab the throat with a solution made by dissolving 10 grains of a powder composed of equal parts of sodium bicarbonate, sodium chloride, and potassium chlorate in an ounce of water; this should be done every two hours or every hour if necessary. It is surprising how this solution will dissolve this membrane or diphtherial membrane if thoroughly applied; in one case of mine the whole surface of the oropharynx and both tonsils was covered with a thick yellow membrane, but it all disappeared in twenty-four hours, and in thirty-six hours the throat was clear. The throat in this case had been painted with solution of silver nitrate and lactic acid for three days without any improvement taking place, and I am convinced that it is quite useless to paint these throats with antiseptic solutions, as they only tend to harden the membrane.

Place a thick piece of diphtherial membrane in this solution, and you will see it melt away; but place a similar piece of membrane in a solution of weak mercury perchloride and it will become tougher than before. The effect of the serum is in some cases astonishing; in others it is very slow, and a second dose may be required. One very acute case—a lad with empyema of the right maxillary antrum, with a temperature of 105° and a pulse of 140, a thick-coated tongue, and an intensely inflamed septic throat—recovered in less than forty-eight hours. I always prescribe an effervescing mixture of iron and quinine every four hours, giving 20 minims of tinct. ferri perchlor. to each dose; the bowels must, of course, be thoroughly cleared with a good dose of calomel.

Retropharyngeal Abscess.

Retropharyngeal abscess may follow a septic throat. It is, however, a very rare occurrence in adults. I saw one in consultation with Dr. Genney last year. The patient's throat had not been very acutely inflamed, but the abscess, which was situated on the right side, was a large one, and I advised immediate operation on account of the danger of the abscess bursting during his sleep and flooding his larynx; in this case I opened the abscess by means of a 3 in. incision along the posterior border of the sternomastoid muscle. I feel sure that in adults, at any rate, this method is attended with less risk than opening through the pharyngeal wall, which is the method usually employed with children in acute cases. I know of one case in which a fine athletic young man died of septic

pneumonia three days after such an abscess had been opened through the pharynx. In the case I operated on a culture from the pus gave a pure growth of the *Streptococcus pyogenes aureus*. The patient did extremely well until the tenth day, when his temperature suddenly rose to 104°; we decided to give 10 c.cm. of polyvalent serum and this had a wonderful effect, for the temperature fell to normal in eighteen hours, and there was no further rise.

The only condition that could be mistaken for a retropharyngeal abscess in an adult is a large gumma. In children a chronic retropharyngeal abscess, due to adenitis or vertebral caries, is not at all uncommon, and in these cases I have always performed the external operation, and up to the present I have not lost a case.

Tonsillitis.

The tonsils are a great source of trouble to many people, and are subject to various forms of inflammation, the most common being lacunar and parenchymatous. In the former the brunt of the inflammation falls upon the lacunae, which are plugged with yellow material, and in some cases small abscesses form at the bottom of the crypts; in the latter the whole tonsil is swollen and inflamed, and if both are attacked at the same time may meet in the middle line, and make swallowing a matter of very great difficulty. The pain may sometimes be relieved by placing the index finger in front of the tragus on each side during deglutition. Rheumatism has been assigned as the poison which causes many of these cases of acute tonsillitis, and it is—in children, at any rate—essential to keep the patient at rest in bed, and a careful examination of the heart should be made, and if any cardiac trouble be discovered small blisters should be applied over the cardiac area. I find gargles worse than useless in these cases, and it is better to give the patient guaiacum lozenges to suck freely and to apply warm alkaline lotion to the throat with a brush several times a day. I always prescribe sodium salicylate, sodium bicarbonate, and ammonium bromide, and, if there is a high temperature, I add tincture of aconite. Sodium benzoate is said to cure acute lacunar tonsillitis in from twelve to thirty-six hours if given in 5 to 15 grain doses every two hours. Some patients prefer warm fluids, while others obtain more relief from sucking ice.

We have a different condition to deal with when the peritonsillar tissue is the seat of inflammation, for in these cases we nearly always have abscess formation and the tonsil is pushed downwards and inwards; the faucial pillars and corresponding half of the soft palate are acutely inflamed; hot linseed poultices round the neck and hot drinks help matters, but venous hyperaemia, by means of a long narrow cupping glass, is better still. As soon as pus has formed it should be evacuated. It is cruel to leave a patient to suffer perhaps another forty-eight hours to allow the abscess to burst; it is far better to paint the throat with cocaine and incise the abscess with a bistoury, and then pass in a pair of narrow forceps, which should be opened until all the pus has been evacuated. The point of the bistoury should be inserted at the outer of the two angles formed by a horizontal line passing through the base of the soft palate and intersecting the vertical line passing along the surface of the inflamed tonsil; the bistoury should be plunged in to the depth of $\frac{1}{2}$ in., and then a pair of narrow forceps passed along the track and opened in different directions until the pus has been found. When recurrent attacks of tonsillitis occur there is always some cause—for example, obstruction to nasal respiration, bad hygiene, or carious teeth—which must be removed.

There can be no doubt about the expediency of removing tonsils which are the seat of chronic tonsillitis or have been subject to recurrent attacks of acute inflammation; in the latter case, every piece of tonsillar tissue must be removed or our object will not be attained. I remember a case of a nurse who had been practically thrown out of work by constantly recurring attacks of tonsillitis, although both tonsils had been sliced with the guillotine on two separate occasions, yet when the offending tonsils were removed *in toto* with punch forceps no further trouble was experienced. It is, I think, impossible for any surgeon to remove the whole of a tonsil with the guillotine single handed, because the tonsil slips away when pressure is put upon it; it is therefore necessary to have an assistant to press the tonsil into the fenestrum of the instrument.

I have had a pair of forceps made with the blades cutting up and down so that they may fit in between the pillars of the fauces, which are in danger of being injured if the blades cut from before backwards.

Calculi often occur in the tonsils, due to the retention of the secretions in the lacunae, and these become calcified. They usually occur in the upper part of the tonsil. They may give rise to no symptoms or may cause prolonged supuration with periodical attacks of acute or subacute inflammation or severe pricking sensation or stabbing pains in the faucial

regions or ears. The submaxillary glands may enlarge owing to the continued irritation. No difficulty is experienced in removing these calculi either with a scoop or a pair of forceps.

Malignant Growths.

Sarcoma is the most common of the malignant tumours which affect the tonsil, and may present itself as a smooth, red, irregularly-lobulated tumour, which tends to spread externally. If seen at this stage before the glands are affected, the tumour can in many cases be shelled out from its capsule with very little trouble and little if any haemorrhage. If ulceration has occurred the outlook is very different; still, if the condition of the patient is good an attempt should be made to remove the growth.

I have had a fairly large experience in the treatment of both sarcoma and carcinoma of this region with *x* rays and radium, and I find that not only is the rate of growth not checked, but in some cases it is accelerated. I had, however, one case of sarcoma of the right tonsil with extensive enlargement of the glands, which I treated with large doses of *x* rays, with the result that after the growth had been removed from the tonsil the glands subsided entirely, and did not give any trouble until a recurrence took place in the tonsil. Further *x*-ray treatment again caused the glands to subside; but a third recurrence took place, and in spite of all I could do the glands enlarged to an enormous size and the patient died.

The clinical aspect of carcinoma of the tonsil is quite characteristic—an excavated ulcer with hard, everted edges. The only condition which may simulate it in any way is a broken-down gumma, which would disappear under large doses of potassium iodide.

Syphilis.

I have found more relief is obtained by the insufflation of orthoform in ulcerated conditions of the pharynx and larynx than by any other method. In secondary syphilis of the pharynx, the so-called "snail-track" ulcer, the best local application is a solution of chromic acid (10 grains to the oz.). Inherited syphilis often attacks the bucco-pharyngeal cavity, and may produce a deep ulceration in the centre of the hard or soft palate, nasal fossae, or posterior wall of the pharynx, laying bare the bone and causing necrosis.

Chronic Pharyngitis.

Chronic pharyngitis is a very common complaint, causing the patient a considerable amount of discomfort, which a highly nervous individual may magnify into real pain. Some of these cases are of the simple variety, and the soft palate, faucial pillars, and oropharynx are red and inflamed; there is a good deal of tenacious mucus on the wall of the pharynx which the patient finds it difficult to get rid of, especially in the morning, and this causes retching, and in some cases a troublesome barking cough. These patients complain that they have always got something in the throat which they are unable to get rid of, and also a tickling sensation starting in the soft palate and spreading over the whole of the pharynx, and they feel that it would give them ease if they could rub the surface with a finger; all these sensations are more marked when hyperplasia of the lymphoid follicles which surround

the ducts of the mucous glands on the posterior wall of the pharynx has taken place, causing granules which vary in size from a split pea to a threepenny piece, and which in some cases form lateral bands behind the posterior faucial pillars; these are best seen when the patient retches. Prominent blood vessels sometimes run across the wall of the pharynx, and give rise to a great deal of discomfort unless they are obliterated with the galvano-cautery. This granular variety is very often met with in clergymen and other professional voice-users.

Chronic pharyngitis is often the only visible sign of some constitutional defect, and its successful treatment depends upon the care taken in ascertaining the cause; this may be some bad habit—for example, drinking alcohol to excess, especially spirits (topers always have a very sensitive throat), excessive tea drinking (in men as well as women), smoking (especially cigarettes), the use of pickles, sauces, and hot spicy foods. If there be a history of gout or rheumatism I eliminate meat from the dietary. In any case in which the patient complains of dyspepsia and heartburn I insist upon a very simple diet, and order a mixture of soda and gentian before meals and papain in cachets or tabloids after food; constipation is often troublesome in such cases, and an aperient water in the morning, fasting, is the best corrective. If there are any carious teeth present the patient must see the dentist. A warm alkaline douch for the nose will give much relief, and if the same fluid is used with a brush on the wall of the pharynx most of the mucus will be removed without any difficulty; the pharynx may then be brushed with some astringent paint—for example, silver nitrate solution in various strengths or a solution of iodine in potassium iodide. If the granules do not disappear under this treatment they should be destroyed with the galvano-cautery blade, only a few being touched at each sitting. This is best done under cocaine anaesthesia. One of the best lozenges to prescribe in these cases is the carbolic acid of the *British Pharmacopoeia*; menthol in the form of a lozenge with a black-currant base sometimes gives great relief, but some patients have a great distaste for menthol.

In quite a large number of cases of chronic pharyngitis a careful examination of the nose will reveal some obstruction to nasal respiration; this must of course be remedied, especially if it is sufficient to cause the patient to sleep with the mouth open. The form of obstruction that I have found most commonly associated with pharyngitis is that known as "alternating rhinitis," where first one nasal passage and then the other is blocked by the swelling of the inferior turbinate bone; this occurs most frequently when the patient is in bed, and he finds that he is unable to breathe through the dependent nostril. When the patient is examined both nostrils may be patent, and the condition may be missed unless the patient is closely questioned. Application of the galvano-cautery to the mucous membrane of the offending turbinates may cure this condition, but in some cases is not sufficient, and it is necessary to remove the anterior third of the bone; this I do under anaesthesia produced by the application of a 10 per cent. solution of alypin, a less toxic drug, which I find quite as effective as cocaine. The method I employ is to make a cut with scissors, which I had made for the purpose with the lower blade a little longer than the upper. I then pass the loop of the cold snare round the cut end, and by tightening it up remove the amount I consider necessary; haemorrhage is free at the time, but soon ceases, especially if calcium chloride has been administered to the patient in 15 grain doses for three days before the operation is performed. I find it best to give this drug one hour before each meal.

A very dry condition of the pharyngeal mucous membrane is sometimes seen in weak, anaemic women, and no other cause can be detected save the condition of their general health. The best treatment is the administration of cod-liver oil and iron and change of air; indeed, most patients suffering from chronic pharyngitis derive benefit

from change of air, and of all places that I have tried I find Buxton the best, except when the patient is suffering from rheumatism. Then I recommend either Malvern or Droitwich, so that the brine baths may be taken as part of the cure.

Laryngitis.

Although ulceration of the vocal cords never occurs in simple chronic laryngitis, still this is a condition which is very difficult to cure, and which very often relapses. It often occurs with chronic pharyngitis, and the same causes which have been mentioned in that condition should be looked for and eliminated as far as possible. The inhalation of steam medicated with compound tincture of benzoin or the oil of Scotch fir often gives relief. Care must be taken that the steam is not of too high a temperature, and I always advise patients to mix two-thirds of boiling water with one-third of cold water. If the secretions be viscid and difficult to get rid of, the best lozenge is one composed of ammonium chloride, the only drawback being the disagreeable taste; potassium iodide and tincture of nuxvomica in a mixture will often help in this condition. It may be necessary to apply astringent solutions direct to the seat of inflammation, and of these zinc chloride is the best; a wool brush made by twisting some wool tightly round a curved Playfair's probe should be used. The patient must be instructed to use the voice as little as possible.

Laryngitis may be due to the tubercle bacillus, and is then nearly always secondary to tuberculous disease of the lung. It may occur in quite the early stage of pulmonary tuberculosis, before any physical signs can be detected with the stethoscope, although the extent of the lung mischief may be apparent if the chest be examined with the *x* rays. The importance of an early diagnosis is very great, because laryngeal tuberculosis is not now the extremely fatal disease which it was thought to be some years ago. I have seen some cases make very good recoveries, even when both lungs were affected. The most important point in the treatment is rest to the larynx; the patient must be instructed not to raise his voice above a whisper. Even when ulceration has taken place, the patient need not necessarily lose hope, if only he is able to devote the necessary time and money to a long stay in a good sanatorium. I have more than one patient under my supervision in whom the ulcer has cicatrized, the lung trouble has become quiescent, and the patient has resumed work. Where ulceration is present and pain a prominent feature, insufflation of orthoform gives more relief than anything else, and the patient soon learns to do this for himself. Active local treatment, also, is sometimes necessary in these cases.

Malignant Disease of the Larynx.

Malignant new growths are divisible into two groups, intrinsic and extrinsic. The former include tumours growing from the ventricular bands, the ventricles, the vocal cords, and the parts immediately below the cords. The term "extrinsic" is applied to neoplasms taking their origin from the epiglottis, aryepiglottic folds, the interarytenoid fold, the pyriform sinus, and the posterior surface of the cricoid plate. The importance of this classification lies in the fact that intrinsic cancer is of slow growth, and secondary deposits only occur late in the disease when the growth has spread beyond the confines of the larynx. Early diagnosis and prompt operation give better results than follow removal of cancer in any other region of the body. Indeed, some very excellent results have been obtained since the method of attacking the disease by the external operation of thyrotomy has superseded the older methods of intralaryngeal removal.

A very different story has to be told of extrinsic cancer, for in these cases ulceration occurs early, and the glands are involved much earlier. The only condition which this could be mistaken for is a broken-down gumma. Even in these late cases, if the patient's general condition warrants it, an attempt should be made to extirpate the disease by complete excision of the larynx provided the serious danger of the operation is placed before the patient, and he prefers to face this rather than the inevitable suffering which must ensue if the disease is allowed to take its natural course. It should be laid down as an absolute rule that when an adult complains of hoarseness or alteration of voice of several weeks' duration, the larynx

should be carefully examined, and if there is diminished mobility of a vocal cord with or without a definite tumour, the help of a skilled laryngologist should be promptly obtained. Many lives and much suffering would be saved if this rule were rigidly observed by those who first see these cases.

ON THE WASSERMANN REACTION IN GENERAL PARALYSIS OF THE INSANE.*

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WHEN the serum of a syphilitic patient is mixed with an extract made from the liver of a syphilitic fetus, the mixture possesses a property not possessed by either constituent alone in the same degree. It is able to take up complement. That this is the case is shown by adding to the mixture a suitable quantity of complement—that is, fresh guinea-pig serum—and after an interval adding sensitized red blood corpuscles. The red cells remain intact, suspended in the fluid; whereas, if the complement had not previously been taken up, they would have been laked.

A quite analogous phenomenon occurs in other conditions. If we mix the serum of a typhoid patient with an extract of typhoid bacilli, the mixture similarly acquires the property of fixing complement; and this is true for many other organisms and the corresponding serums. It seemed reasonable, therefore, to suppose, as Wassermann¹ did when he discovered the syphilis reaction, that in this case also he was dealing with an extract of the causal organism and the corresponding serum. In other words, the liver extract was active because it was an extract of the *Spirochaeta pallida* contained in the liver, and the serum was active because the patient had responded to the invasion of the spirochaete by producing an antibody in his blood. If this were so, the reaction would be specific; the complement would be fixed only if the serum came from a syphilitic, but would remain free if the serum were derived from a non-syphilitic; and a method for the serum-diagnosis of syphilis would have been devised. This proved to be the case. The reaction is specific for syphilis, and its value as an aid to diagnosis is admitted. The theoretical support, however, and the convenient explanation of the specificity which the typhoid and other analogies supplied, have had to be abandoned. It has been shown by many workers^{2,3,4} that the spirochaete is not an essential factor in the liver extract. Non-specific substances such as the heart of the guinea-pig,⁵ or even combinations of such relatively well-defined bodies as lecithin, oleic acid, and sodium oleate,⁶ may replace the syphilitic liver in the reaction. Its validity, therefore, as a means of diagnosing syphilis depends entirely on the empirical proof. This fortunately is present in embarrassing quantity. Wassermann⁷ himself a year ago could report the examination of 1010 non-syphilitic serums without a single positive result, and although there is now a small number of cases on record in which a positive reaction has been obtained in the absence of syphilis, it is everywhere accepted that the reaction is thoroughly reliable as an aid to diagnosis.

Immediately after his announcement of the method, Wassermann published with Plaut⁸ a paper showing that if the cerebro-spinal fluid from cases of general paralysis of the insane were used in place of the syphilitic serum in his reaction, the complement was fixed in the same manner. This was hailed at once as supplying an objective proof of the connexion of general paralysis with syphilis, which had long been asserted on clinical grounds.

At Dr. Mott's request we undertook the examination of a series of spinal fluids from cases of general paralysis and other diseases, the result of which we record in this paper.

* The results of a considerable portion of this work have already been reported by Dr. Mott in his Morison Lectures. See BRITISH MEDICAL JOURNAL, 1909, February 20th, p. 454.