The presence of spores in the granulomata with an absence of mycelial development has been noted by all observers. Whether the explanation put forward to account for this phenomenon in our case is generally applicable we cannot say. It has been recorded, as stated above, that certain strains grow best at 37° C., but, so far as the published accounts go, little attention appears to have been paid to the relationship of the temperature factor to the microscopic characters of the fungus.

Serum Reactions.—In sporotrichosis, as in other diseases, the properties of the serum have been studied—in this case by Vidal,¹⁸ who recommends that a portion of an agar culture, four to six weeks old, should be emulsified and filtered through filter paper, so as to give a concentration of from 130 to 150 spores per field of a microscopic magnification of about 400 diameters. With such an emulsion a reaction has been observed with serum in a dilution of from 1 in 200 to 1 in 400, or even higher. Complement deviation has also been observed, the antigen being the above emulsion of spores, used in a proportion of 1 part of emulsion to 2 parts of serum. In the case of both the agglutination and complement deviation tests, however, the position is complicated by the fact that the serum of patients suffering from other mycotic infections—for example, thrush, actinomycosis—reacts to *Sporotrichon beurmanni*.

The *Sporotrichon beurmanni* has been found living on decaying vegetable material (de Beurmann and Gougerot),¹⁸ and recently considerable attention has been paid to the part which it plays in animal disease. Gougerot and Caravan¹⁴ have described three cases of sporotrichosis in the dog, in two of which there were ulcerating granulomata in the neck, and in the third an affection of the peritoneum, the liver, and lungs. Spontaneous epidemics have also been observed in the rat. The most important observations, however, relate to the discovery of a sporotrichon as a causal agent in epizootic lymphangitis in the horse—a condition characterized by superficial granulomata bearing a resemblance to glanders, but of a benign nature. Whether all cases of the disease which go under this denomination are due to the same cause seems as yet undetermined. The condition is often associated with the presence in pus from the lesions of a large body said to be capsulated, usually referred to as the "cryptococcus of Rivolta." The botanical relationships of this organism have not been worked out, but it has been grouped amongst the blastomycetes, as, for instance, by Tokishige.¹⁶ In America (Page, Frothingham, and Paige¹¹) certain cases of epizootic lymphangitis have, however, been traced to a sporotrix apparently identical or closely related to that of de Beurmann, and similar results have been obtained in Madagascar by Carougeau.¹⁶

Hyde and Davis¹⁷ have considered the possibility of such observations being important from the standpoint of human pathology, as in one case of sporotrichosis in man there was a strong suspicion that infection had arisen from a horse; and they note that during the last seven or eight years twelve human cases have occurred in the southern part of North Dakota, a district in which sporotrichosis in the horse has probably been fairly common.

Pathological Diagnosis.—It is stated that if the pus of a sporotrichon lesion be examined without staining, the spores can be recognized as highly refractile double-contoured objects. It is further stated—by Landouzy¹⁹—that if, after inoculating a sloped agar tube, a droplet of the pus be smeared on the naked glass opposite the medium, sprouting of mycelium from the contained spores can be observed with a low power of the microscope.

The diagnosis, however, essentially rests on the isolation of the organism. For this purpose tubes of potato or of glycerinated carrot, of plain sloped agar and glucose agar, should be inoculated, preferably from a non-ulcerating lesion. One set of tubes should be incubated at 37° C., and another at 22° C., and kept under observation for at least a week.

It is evident that cases of sporotrichosis can easily be overlooked. To ensure that the primary cultures shall be pure, material from unbroken lesions must be obtained and the difficulty of microscopically demonstrating the fungus in the lesions, the necessity in many cases for the use of media containing sugar, the special thermal relationships of the organism, the non-appearance of visible growth till several days after inoculation, the peculiar microscopic appearances which often suggest the presence of yeasts, the relative insusceptibility of the guinea-pig to inoculation, all open up paths for the organism being missed. Further, the marked therapeutic effect of potassium iodide may suggest a diagnosis of syphilis and obscure the recognition

of the true condition present. It is obvious, however, that in all granulomata, especially of the skin, which cannot be clearly attributed to the ordinary causes of such lesions, the possibility of sporotrichosis should be kept in view. Usually, if such precautions as those we have detailed be observed, little difficulty will be experienced in the fungus being isolated, if it be present.

We must acknowledge our great indebtedness to Dr. R. Cranston Low for the drawings of which reproductions appear in the coloured plate. We also owe our thanks to the Carnegie Trust for a grant from which the expenses of the inoculation experiments were defrayed.

REFERENCES.

- ¹ Schenk: *Johns Hopkins Hospital Bull.*, 1898, vol. ix, p. 286.
- ² Hektoen and Perkins: *Journ. Exper. Med.*, 1900, vol. v, p. 77.
- ³ Brayton: *Indianapolis Med. Journ.*, 1899, vol. xviii, p. 272.
- ⁴ De Beurmann and Ramond: *Annal. de Derm.*, 1906, pp. 837, 914, 993.
- ⁵ Ofenheim: *Lancet*, 1911, vol. i, p. 659.
- ⁶ Pautrier and Lubemtacher, *Bull. de la Soc. Franc. de Dermatologie*, 1909, p. 254.
- ⁷ Vidal and Abrami: *Bull. de la Soc. de Méd. des Hôp. de Paris*, June 5th, 1908.
- ⁸ De Beurmann, Gougerot, and Gaucher: *Bull. de la Soc. de Méd. des Hôp.*, 1908, No. 20, p. 837.
- ⁹ Low: *Edin. Med. Journ.*, February, 1911, p. 121.
- ¹⁰ Foulerton, *Trans. Path. Soc. Lond.*, 1901, vol. lii, p. 259.
- ¹¹ Page, Frothingham, and Paige, *Journal of Medical Research*, 1910, vol. xxviii, p. 157.
- ¹² Gougerot, *Gaz. des Hôp.*, 1909, pp. 537, 581.
- ¹³ De Beurmann and Gougerot, *Bull. Soc. de Méd. des Hôp.*, 1908, vol. xxvi, p. 753.
- ¹⁴ Gougerot and Caravan, *Presse médicale*, 1908, p. 337.
- ¹⁵ Tokishige, *Centralbl. f. Bakteriöl.*, 1896, Abth. I, vol. xix, p. 105.
- ¹⁶ Carougeau, Reference in *Centralbl. f. Bakteriöl.*, 1910, Abth. I, vol. xlv, p. 610.
- ¹⁷ Hyde and Davis, *Journ. Cutan. Diseases*, New York, 1910, vol. xxviii, p. 321.
- ¹⁸ Vidal, *Ann. de l'Inst. Pasteur*, 1910, vol. xxiv, p. 1.
- ¹⁹ Landouzy, *Presse médicale*, 1909, p. 785.

CARCINOMA OF THE LARYNX

EXTIRPATION OF PRIMARY AND SECONDARY GROWTHS: GLANDULAR RECURRENCE: TREATMENT WITH THYROID EXTRACT: DISAPPEARANCE OF GROWTHS.*

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MR. CHAIRMAN AND GENTLEMEN,—I should not trouble you with a paper on so well-worn a subject as extirpation of the larynx, were it not that the following case has points of quite exceptional interest.

The patient, M. W. L., aged 51, was sent to me by Dr. William Hamilton, of Boyle, in November, 1909. He complained of pain and difficulty in swallowing for about two months, the pain latterly increasing in severity and shooting towards the right ear, while the dysphagia was so great that only fluid and so-called semi-fluid foods could be taken.

The patient had a very intolerant throat, and examination could only be conducted after cocaine had been applied. The right side of the larynx was seen to be occupied by a large growth having an ulcerated surface presenting backwards and outwards towards the sinus pyriformis and the opening of the gullet. A gland or two over the carotid sheath at the level of the upper border of the thyroid cartilage were palpably but not greatly enlarged. There was no history of syphilis or any other important complaint. A diagnosis of malignant disease was made, and a portion of the growth removed for microscopic examination. Dr. Earl, to whom it was submitted, reported it to be a flat-celled carcinoma. Sir Charles Ball saw the patient in consultation with Dr. Hamilton and me, and agreed that total extirpation of the larynx offered the only hope of saving the patient's life. This course was agreed to by the patient.

With a view to lessening the severity of the sepsis which necessarily follows such an operation, it was decided to

* A paper read before the Surgical Section of the Royal Academy of Medicine in Ireland, May, 1911.

administer a vaccine beforehand. Accordingly, a swab was taken from the patient's throat, and found by Professor O'Sullivan to contain a variety of micro-organisms, the most numerous being *Staphylococcus albus*; but *Staphylococcus aureus* and a streptococcus were also found. His index for *Staphylococcus albus* was taken and found to be 0.9. A vaccine was made from these organisms containing 30 million *albus*, 15 million *aureus*, and about 8 million of the streptococcus in 0.5 c.cm. This dose was injected into the back between the shoulders two days before operation. The index for *Staphylococcus albus* of the blood taken thirty hours after injection was 1.2.

Operation was performed on November 27th, 1909, Professor E. H. Taylor assisting. Tracheotomy was first performed, and the anaesthetic administered through the tracheotomy tube during the subsequent steps. The larynx was opened in the middle line, and an examination made in order to see if it would be possible to take away the growth without sacrificing the whole organ. The tumour occupied the whole of the right wall of the larynx, and involved the back wall so extensively that anything short of total extirpation was out of the question. The larynx was accordingly removed, and the trachea sutured to the skin above the suprasternal notch. A rubber tube, 9 mm. in diameter, was introduced through the nose into the stomach. The sac of the pharynx was sutured in the middle line so as to shut off the food and air passages the one from the other. The operation lasted a little over two hours. His pulse and colour were both good when he was put back to bed.

The patient went on fairly well for some days. His temperature remained below 100° F., but he suffered considerably from cough and bronchitis accompanied by profuse purulent liquid expectoration, and his sleep was meagre. Two days after operation the patient was seized with a fit of coughing, in which the feeding tube was expelled through the nose. It was replaced successfully though with some difficulty. On the third day the character of the expectoration changed. It became thicker, and more like muco-pus. He still slept badly—about four hours per diem—and never more than half an hour at a time. On the fourth day some superficial necrosis showed itself in the wound, and the skin for a considerable distance round the tracheal opening was acutely inflamed.

On the fifth day, while dozing after a hypodermic injection of morphine, a gush of blood came from near the base of the tongue. It was stopped by pressure and adrenalin. At 4 a.m. on the sixth day bleeding again took place, this time fairly profusely, but it yielded to the same treatment. Later on I was summoned, to find that the plug, which had been put in to stop the bleeding, had nauseated him, and in his distress he had pulled out both it and the trachea tube; and in the coughing which followed, the stomach tube was expelled through the wound in the throat. The dressings, etc., were replaced, except that, as the pharyngeal stitches had given way, the feeding tube was introduced through the neck wound, to the patient's great relief; he was intolerant from the very first of the tube passing through the pharynx.

The quantity of blood lost in these haemorrhages did not exceed 2 pints. There was no obvious defect in its clotting power. His pulse and respirations remained quiet, and the temperature varied between 98° and 100° F. It was observed about this time that the wound showed no tendency to repair, but rather to extend its boundaries. The anterior surfaces where they had been stitched together had failed to adhere, and the granulations were of the poorest quality. It looked, in fact, as if the tissues were slowly melting away. A silkworm suture by which the trachea was anchored to the skin in front of the suprasternal notch, cut through, and the resulting ulcer, so far from healing, gradually eroded the skin until it reached the dimensions of a half-crown piece. Some calcium iodide was given in a mixture.

At 5 a.m. on the eleventh day there was a little more haemorrhage, but it was easily controlled. At 3.30 a.m., at 6.30 a.m., and again at 10.30 a.m., on the twelfth day there were more haemorrhages. Some calcium chloride was administered in the hope of checking the bleeding, though it appeared to be caused rather by the ulcerative process described above than by any defective blood condition. At this time the wound presented a startling appear-

ance. Every stitch had cut through, and no two surfaces had united. The trachea was isolated and surrounded by sloughing areolar tissue, through which it rose and fell with great amplitude of movement during coughing. The pus from the sloughing tissues was very profuse, and it was only by unremitting care on the part of the nurses that it could be kept from overflowing into the trachea. A suction apparatus, such as was devised by me, and described in the *Transactions of the Royal Academy of Medicine in Ireland*, vol. xiv, 1896, rendered the most admirable service.

On the sixteenth day after operation a decided improvement took place in the appearance of the granulations. They began to grow abundantly, and from this date the wound filled in with wonderful rapidity.

By the end of December healing was practically complete, but the upper borders of the trachea and gullet had epithelialized, thus establishing a fistula between the two tubes. His cough had disappeared; he was able to sit up for seven hours daily, and the general condition was excellent. On January 19th, 1910, with Sir Charles Ball's assistance, I closed the fistula, but no union took place and the edges separated.

By this time the glands over the right carotid sheath had grown to a considerable size, and it was obvious that their removal—postponed in the hope of our being able to close the fistula—could not be much longer delayed. This operation was carried out on January 29th, Sir C. Ball assisting. One of the glands was so adherent to the jugular that it was necessary to excise between 2 in. and 3 in. of that vein. The glands when examined were found to be cancerous. The wound healed by immediate union.

During all this time food was given by the tube introduced through the fistula. In February I devised a tracheal tube on the principle of Hahn's cannula, by which a rubber covering could be inflated so as to block the fistula, and permit swallowing by the mouth. This worked quite successfully, and on February 21st he tasted his first meal of half a dozen oysters. He left the nursing home on March 19th, and was recommended to present himself for examination at least monthly.

The patient was examined repeatedly after this time. The fistula remained open, but owing to the inflating device on the cannula swallowing could be carried on quite comfortably, while at other than meal-times the presence of the fistula enabled him to talk with quite a good voice. In fact, the advantage of being able to talk far outweighed any inconvenience resulting from the fistula, and the patient decided not to have it closed. He was seen at intervals until early in July, 1910. Examination then revealed no recurrence of the disease either in the throat or in the glands.

The patient's next visit was three months later, when, on October 19th, a tumour of considerable size—about that of a walnut—was found on the right side of the neck, the centre of the growth corresponding to the level of the bifurcation of the carotid. It was stony hard, and an obvious recurrence of the disease. There was no ulceration in the pharynx.

It was decided that an attempt should be made to remove it, and on October 22nd the patient was again anaesthetized, Dr. Mulloy of Kensington being present. When the tumour was defined and separated from the tissues in front and at its inner and outer sides, we found that, as not uncommonly happens, the condition was worse than appeared from external examination. The growth involved not only the common carotid artery but the prevertebral muscles. Professor E. H. Taylor, who assisted, entirely agreed with me that it was inadvisable to proceed further. Complete removal could only be accomplished by exposing a healthy portion of the common carotid, ligaturing it, and dissecting the cancerous mass up from below, and sacrificing the pneumogastric nerve—an operation that would almost certainly have been fatal, while it gave little or no prospect of eradicating the disease. The lower portion of the mass involved the thyroid gland. Accordingly, the operation was abandoned, except that a small portion was removed for microscopic examination. This proved to be cancerous.

On October 28th I asked Sir Charles Ball to see the patient with me in consultation. He suggested that thyroid extract should be given, and quoted two cases of inoperable cancerous lymphatic glands in which that

remedy had been tried with success, though he had tried it in others without any good effect. Three-grain doses of the extract in the form of tabloids (B. W. and Co.) were prescribed three times daily.

On November 22nd—that is, a calendar month after the last operation—the patient came to me complaining of discomfort at the front of the neck low down to the right of the tracheal opening. The skin was tense and fluctuating, but there was no redness of the skin or tenderness. This fluctuating tumour was separated from the hard mass above by a groove which had apparently been caused by the tracheotomy tape. A small incision was made and several drachms of curdy whitish matter evacuated. It was obviously not pus, and I considered it was caused by some necrotic process taking place in the growth; and I remember thinking it strange that if necrotic softening were taking place it should not preferably start where the tumour was bulkiest and most remote from the blood supply. The possible influence of the patient's thyroid gland did not then occur to me. After daily examination for three or four days no more discharge appeared, and the wound was allowed to close.

The patient returned on December 12th with the same symptoms as on November 22nd. The same treatment was carried out, but this time the discharge persisted longer; the wound was finally allowed to close in the first week of January.

The treatment by thyroid extract was continued without interruption from October 28th. At the end of three months (January 24th, 1911) it appeared to me that the growth was not quite so large, but I hardly trusted my observation. At the end of four months there was no possible room for doubt on the matter. The infiltration round the glands had disappeared, and the glands themselves were certainly smaller; and at this time (February 27th, 1911) the patient reported that for the last week he had been quite free from the shooting pains on the right side of the neck which had been in existence for a considerable time previously.

The glands continued to diminish in size. Early in March the dose of thyroid was increased to 12 grains per diem. The patient had previously tried to take this amount, but could not tolerate it. On March 27th there was no more than a suspicion of any abnormality in the neck, and six months after the treatment was started no evidence of tumour could be felt. Sir Thornley Stoker saw the patient with me in consultation at this time, and advised the continuation of the thyroid treatment.

So far as I know, the only cases in which success by this treatment has been recorded have been those of lymphatic recurrences where the primary growth was first extirpated.

This, the most recent of a series of well-authenticated cases of cancerous recurrences in lymphatic glands cured by thyroid extract, opens up some very important and interesting questions.

1. What is the nature of the influence of the thyroid extract, and by what process did the tumour melt?
2. How far does the existence of such cases go to prove that one of the conditions necessary for the occurrence of cancer in an individual is some defective or abnormal internal secretion?
3. Why does thyroid extract cure a few cases and leave others unaffected?
4. What was the influence, if any, of the vaccine on the subsequent suppuration?

Whatever answers are given to these questions, we must keep in view the important fact that cancer can sometimes be made to undergo a recessionary cure under the influence of an animal extract, and that such a fact justifies us in looking forward with confidence to the time when the secret of its existence will be wrested from this scourge of humanity, and its prevention, or at least its cure, merely a question of the knowledge and the drug.

IN view of the disadvantages accruing to the Chelsea Hospital for Women from the noise of traffic and lack of adequate space for nurses' accommodation and out-patient work, Earl Cadogan has presented the institution with a new site. It is over an acre and a quarter in extent, and though within short distance of present building, is very quiet.

A Clinical Lecture

ON

SOME CASES OF CHRONIC JAUNDICE IN WHICH OPENING THE DUODENUM WAS REQUIRED.

DELIVERED AT THE MEDICAL GRADUATES' COLLEGE AND POLYCLINIC.

BY

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My observations will be based upon ten cases in which I have found it necessary to explore the duodenal end of the bile duct to unravel the cause of a more or less persistent jaundice.

In proceeding to make a diagnosis in chronic jaundice it must be remembered that jaundice is not a symptom of stone in the gall bladder. It is not present unless there is some associated infection spreading to the hepatic or common ducts related or not with the passage of a stone which has left the gall bladder on its way downwards to the bowel; should this be suspected, the recovery of a stone from the faeces would solve the riddle, but in many instances when a stone has passed into the common duct it remains retained there. The accidental jaundice occurring with stone in the gall bladder will, as a rule, be of only a transient character.

Now, retained stones in the common bile duct may be of fair size and yet not produce any special diagnostic symptoms. This is frequently found in operating on a "gall bladder" case; the additional duct stones will most probably occupy the supraduodenal or widest part of the duct. In most cases, however, one would expect special symptoms to be present, which may be as follows.

Pain may not be particularly complained of. If present, it may be specially referred to the epigastrium or to the back; it may be associated with a typical colic with vomiting, but the latter symptoms are in many cases due really to a still present stone in the gall bladder.

Jaundice is a characteristic symptom and varies in intensity and duration. The attacks of jaundice may extend over a long period with intermissions, and in other cases the jaundice, although slight, may never completely disappear. The jaundice is caused not only by the blocking due to the stone, but by the attendant inflammatory swelling of the mucous lining in the presence of an infection. After a while dilatation of the duct and reduction of the catarrhal swelling allow the onward passage of the bile and subsidence of this symptom.

Fever with the jaundice is common, and may be only of a mild continued type; but what is most striking when it occurs is the intermittent form with big rises and falls resembling that of malaria, and to which our attention has been drawn by the writings of Charcot, Osler, and others. This intermittent fever may be accompanied or not by rigors and sweating, and usually at the time there is an increased depth of the jaundice. These attacks are explained by a renewed activity of a bacterial infection, while in the intervals of more or less immunity the severe symptoms may completely pass away, except perhaps a slight jaundiced tinge, only to reappear after a varying interval with the same type of attack faithfully reproduced.

Marked loss of flesh is a feature. In the intervals of the severe symptoms the patient may not feel ill, and may manage to do his work. Itching may be very troublesome.

The liver may or may not be to some extent enlarged and tender; in the majority of cases, owing to its contraction, the gall bladder will not be able to be palpated.

In a large proportion of cases there is an associated pancreatitis, demonstrated by the presence of Cammidge's urinary reaction.

If a stone completely blocks the duct there will be no bile in the faeces. As in many cases there is a varying