quantity varied from 5 to 10 millions, and the injections were made on May 15th, May 18th, May 24th, May 31st, and June 7th. A little pus and blood appeared from time to time in the discharge from the bowel, which never became so offensive as it was before the appendicostomy. The temperature, which had oscillated widely between 102° F. and 98° F., began to show smaller excursions about the beginning of June, and there was no rigor after the operation. The patient left the nursing home on August 15th, but it was not until September 13th that he was able to be carried out into his garden, nor until the middle of November that he could stand without support. He then began to increase in weight steadily from 6 st. 4 lb. on October 23rd to 8 st. 4½ lb. on December 19th. By this time the swelling of his wrists had subsided. On January 11th, 1911, his weight had increased to 8 st. 9 lb., but he had experienced a slight relapse, as his wrists had again become puffy, and there was a return of the discharge from the bowel. The note adds that the patient had suffered similar relapses on previous occasions, and that they seemed to follow a few days after any extra effort or mental excitement.

The history of this case is singularly complete, because Dr. Ogier Ward was able to follow it from its very beginning to convalescence. It shows several of the features which I have found to be common in ulcerative colitis. A gradual onset, marked by a weakness of the rectal mucous membrane, followed by chronic irritation, leading to increased secretion of mucus, and by a desire to go to stool. The irritation passes on slowly to ulceration, marked by the appearance of blood, pus, and offensive stools. Absorption of these inflammatory products produces a state of profound toxæmia, from which the patient may be unable to recover.

The actual cause of the ulceration is unknown, although in several of my cases it has followed parturition, piles, fistula, and fissure. The diagnosis in the later stages is easy, but I find that the medical practitioner is apt to think more lightly of the condition than is warranted by the severity of the disease. The ulceration begins insidiously and with so little pain that the patient only thinks of it as an attack of diarrhoea lasting longer than usual. The patient feels ill, it is true, but the languor is attributed, naturally enough, to the disturbance of the bowels. Even in advanced cases when the onset has been rapid the facial expression is no guide to the local condition, and the friends, therefore, do not become alarmed. This was well exemplified in one of my hospital cases, when it occurred to some of my dressers to ask whether the patient was not a phenomenally lazy person who was making the most of an attack of diarrhoea lasting longer than usual. I asked whether it was our custom to take cases of diarrhoea into a surgical ward. I showed them the patulous anus from which a foul-smelling mucus issued almost continuously, and a few weeks later they were able to see the ulcerated mucous membrane of the colon at the *post mortem* examination.

As a result of this failure to appreciate the severity of the disease it often happens that milder remedies are employed long after the time when they should have been abandoned. Castor oil and irrigation of the rectum by means of a Higginson's syringe are excellent methods of treatment at first, but more heroic means must be adopted if the conditions do not improve quickly. Foremost amongst these comes vaccine-therapy, the vaccine being made from the particular strain of micro-organism which is causing the inflammation. Death from toxæmia is the great danger of the disease, and if the patient is to be rendered immune the earlier the process is begun the more likely are the results to be satisfactory. It is advisable, therefore, to call in the bacteriologist as soon as possible. The surgeon may have to follow. It is clear to most of us that the large intestine cannot be cleansed in its whole extent by simple irrigation from the anus. It is also known from *post-mortem* examinations in only too many cases of ulcerative colitis that any part or even the whole of the large intestine may be ulcerated. The products of the ulceration are very abundant, and their absorption is one of the most serious dangers of the disease. It is important, therefore, to cleanse the bowel and to keep it free from putrefying products. Drainage through the appendix enables this to be done in the most satisfactory manner. The operation of appendicostomy is not so serious as that required for removal of the appendix during the quiet stage. It is very effective, and the fistula can afterwards be closed without trouble; indeed, in some of my cases the difficulty has been to prevent spontaneous closure. On the other hand, it must

be clearly understood that appendicostomy will not cure ulcerative colitis, and the friends of the patient should have this clearly explained to them at the time of the operation, or they will be disappointed. The object of the operation is to keep the bowel clean and to prevent the absorption of toxic products. The ulcerative process continues until the patient becomes immune either by a natural process or by artificial means. Appendicostomy, therefore, prolongs the life of the patient, and thus gives him a better opportunity to be cured. In the cases which have come under my own observation the first effect of appendicostomy has been a material improvement in the condition of the patient, even in the most advanced cases. The temperature falls, the appetite returns, and may remain good permanently. The improvement in the general condition, however, is not maintained in its full extent, and a relapse occurs after a week or two. These relapses are a cause of great anxiety, but, so far as I have seen them, they have only been temporary, and the net result of the operation has been a slow but interrupted progress to recovery after months of illness.

I have tried many different drugs as local applications in these difficult cases of ulcerative colitis. Carbolic acid in all its forms, and however disguised, has caused carbolicuria so often that I have ceased to use it. Bismuth salicylate, perchloride of mercury, biniodide of mercury, and boric acid caused irritation in the earlier stages and were discontinued. Bismuth carbonate (15 grains to 1 pint), potassium permanganate (1 in 30,000), and allmætin, which is hæmatoxylin acted on by formaldehyde (40 grains to 1 pint), proved most useful, and were soothing. In the later stages of the disease irrigation with perchloride of mercury (1 in 20,000), zinc sulphate (4 drachms to 3 pints), and silver nitrate in the strength of 5 to 10 grains to the pint of sterilized water gave the best results when they were used alternately. Ionized irrigations were employed on several occasions, but I could not satisfy myself that they were followed by any marked improvement. Chlorodyne was always useful when an anodyne was required, and it never seemed to lose its effect.

THE USE OF VACCINES IN ACUTE MASTITIS.

BY

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A CONSIDERABLE amount of work has been carried out on the etiology of acute mastitis, but, with the exception of a few isolated cases, little seems to have been done to apply the knowledge so gained by resorting to specific therapy. The cause of this cannot be that acute mastitis is always of short duration, with rapid recovery. A visit to any large out-patient department will show cases of chronic sinuses of breast which obstinately refuse to close up, and remain discharging for months and even years. By a timely use of vaccines in the more acute stages these chronic cases might be prevented from occurring. It is not suggested that inoculation treatment can replace surgery. For reasons I shall give later, it is seldom this most desirable end can be attained. Knowing, however, the specific nature of the disease, it is only rational that we should attempt to increase the resistance of the patient against the particular organism invading the tissues.

BACTERIOLOGY AND MODE OF INFECTION.

The infective nature of this condition being an established fact, it remains to discuss the nature of the organisms and their mode of entrance into the breast. These two matters are of fundamental importance in the question of treatment of vaccines.

From an examination of the pus it has been found that almost any of the common pathogenic bacteria may be present. In a very large proportion of cases, however, *Staphylococcus aureus* is obtained in pure culture. In a much smaller number of cases streptococci have been found, either together with *Staphylococcus aureus* or, more rarely, in pure culture. *Staphylococcus albus* is

occasionally found, generally in conjunction with *Staphylococcus aureus*. These three organisms practically constitute the bacteriology of the ordinary acute mammary abscess.

INFECTION BY THE BLOOD STREAM.

Bacteria may enter the breast from within by the blood stream, or from without. There is evidence to show that bacteria from the blood may be excreted in the milk from an apparently perfectly sound breast.¹ It has, however, been shown that the organisms obtained from the milk are rarely the same as those present in the blood in cases of puerperal fever.² Streptococci are rarely to be found in the milk, whereas staphylococci are frequently present in the sound breasts of both feverish and healthy women.³ Moreover, it is rare to find an acute mastitis occurring in a woman suffering from puerperal fever, although I think this fact may possibly be explained, inasmuch as the secretion of milk in these cases very quickly ceases, and there is then no nidus in which the bacteria can multiply. Thus, although metastatic abscesses may occur they are very rare, and septicaemia as a cause of the ordinary mammary abscess may be practically disregarded.

EXTERNAL INFECTION.

By the external route infection is possible in two ways: (a) Through cracks and fissures of the nipples; (b) through the milk ducts themselves where no nipple lesion exists. Each of these ways is claimed by different authors to be the sole route of infection. Doubtless the truth lies between these two extremes.

It must be generally admitted that lesions of the nipple are not always, or even usually, to be found in cases of mastitis; at any rate, on macroscopical examination H. Ehrlich⁴ in a study of 84 cases found nipple cracks only in 24 per cent. In my own cases they were only found twice in 25 consecutive cases of abscess.

Kehrer calculated that mastitis occurs in 25 per cent. of cases of cracked nipple.⁵

Much light is thrown on the occurrence of infection through a lesion of the nipple by a comparison of the bacterial contents of the cracks themselves with those of the associated abscess, and also with the bacteria of those abscesses which apparently are not associated with a nipple lesion. In a recent monograph by Schalk⁶ the bacterial content of 22 cases of cracked nipple was examined; 14 of these cases showed the presence of *Staphylococcus aureus* in conjunction with streptococcus, while 8 showed *Staphylococcus aureus* alone. In 3 cases suppuration of the mamma occurred, and the bacteria of the abscess were identical with those found in the cracks—that is, in two cases *Staphylococcus aureus* and streptococcus together, and in the third case a pure culture of staphylococcus. In my own two cases with cracked nipple streptococcus was present in both cases in both cracks and abscess pus; in one case it was associated with *Staphylococcus aureus*. In a third case, in which a well-marked fissure had been present but had healed, a pure culture of streptococcus was obtained from the abscess pus. On the other hand, in 12 consecutive cases of my series in which no nipple lesion was present macroscopically, the abscess pus gave a pure culture of *Staphylococcus aureus*. Although infection may undoubtedly occur through a lesion of the nipple, it has been pointed out that pus pouring from a fissure is very likely to infect the adjacent ducts.

ANATOMICAL EVIDENCE.

Where infection through fissures occurs the organisms pass by the lymphatics into the substance of the breast. In these cases suppuration commences in the connective tissues, while the glandular element proper at first plays a passive part. On the contrary, inflammation beginning in the ducts and acini spreads outwards from the glandular into the interstitial tissues. Both of these conditions have been described from histological preparations of cases of mastitis. The bulk of the cases from which morbid material is obtainable are in the later stages, and, as a rule, it is impossible to say exactly where the inflammation has commenced.

Billroth⁷ described a pure interstitial mastitis with the bacteria lying in the lymphatics of the connective tissues leaving the glandular elements untouched; whilst Bumm,⁸ whose work on mastitis is well known, described the conditions present in an early mastitis of glandular origin.

He found the smaller ducts and acini choked with milk clot and bacteria; the epithelium had been shed, and leucocytes were migrating through the basement membrane into the focus of infection. The infecting bacteria were likewise passing from the acini into the surrounding connective tissues.

CLINICAL EVIDENCE.

Clinically it is usually possible to distinguish in their earlier stages two types of mastitis; their onset bears evidence of a different mode of infection.

There are cases in which the inflammation is obviously of the nature of a diffuse cellulitis—a firm uniform swelling forms, usually limited to one part of the gland, and frequently goes on to suppuration. In these cases there is generally no obstruction of the milk flow (even in the affected area) in the earliest stages.

By far the more common kind of case, however, begins as a lobular mastitis, mostly as a sequel to the sudden cessation of suckling. The milk becomes clotted in the distended breast, and there is some pain and rise of temperature. Resolution usually takes place, and the condition rarely goes on to suppuration. A lesion of the nipple is seldom found to account for this. How far the condition is of bacterial origin is not certain, but if the clots from such an obstructed breast are examined they are usually found to contain numerous bacteria, nearly always staphylococci.

PROCESS OF INFECTION.

The course of events would appear to be as follows: When suckling ceases the bacteria present, mostly staphylococci, flourish in the stagnant milk, and clotting ensues. The irritation caused by the milk clot and bacterial toxins leads to invasion by leucocytes; these probably digest the milk clot, and, if possible, take up the bacteria also. We know, however, that opsonin is essential for phagocytosis of bacteria to take place. The presence of opsonin in small quantities has been shown in milk, and it has also been demonstrated that, like other bacterial antibodies, it varies in amount in direct proportion to that present in the blood.^{9,10} The main point at issue is whether there is sufficient opsonin present to allow the bacteria to be taken up by the leucocytes, or whether they will be able to flourish unhindered and lead to abscess formation.

SOURCE OF THE INFECTING ORGANISM.

As to the immediate source of the infecting organism, Koestlin¹¹ found *Staphylococcus albus* on the nipple and areola in 297 consecutive cases.

Cohn and Neumann¹² have shown that *Staphylococcus albus* and *Staphylococcus aureus* are the most frequent bacteria to be found in the milk from normal breasts, but they are few in number. In the intervals between suckling, however, the bacteria multiply to a considerable extent, especially if these periods are prolonged. In the milk from obstructed breasts they found these organisms present in great abundance. These observers also found that most bacteria were to be found in the sample of milk first drawn—that is, that lying nearest the nipple. Schalk⁶ has recently shown that organisms similar to those found in the nipple cracks and associated abscesses are also to be found in the child's mouth and in the maternal vagina at birth. He traces infection through these channels.

CONCLUSIONS AS TO THE ETIOLOGY AND PATHOLOGY.

It would be well to state these conclusions before proceeding to the subject of treatment.

There are two organisms which are the cause of almost all the cases of acute mastitis. They are the *Staphylococcus aureus* and the streptococcus of one variety or another.

I. The *Staphylococcus aureus* is by far the more common. It usually enters by the ducts, causing clotting of the milk and obstruction; it then multiplies in the acini. The condition begins as a lobular mastitis, and subsequently the surrounding tissues may be involved with suppuration.

II. The streptococcal form of infection occurs through a lesion of the nipple; it spreads by the lymphatics and involves the interglandular cellular tissues without at first causing obstruction of the milk.

TREATMENT.

I.

Taking first that class of case in which direct infection from a nipple lesion has occurred, the course from an inoculation point of view is quite clear.

The infecting organism—probably a streptococcus, or streptococcus and *Staphylococcus aureus* together—can be cultured from the nipple crack and a vaccine prepared.

In the substance of the breast the invading bacteria are lying in the lymphatic vessels and connective tissues of a part which is thoroughly well flushed with the body fluids. They are thus quickly influenced by any alteration in the content of opsonin or other antibodies carried in the blood and lymph streams. These cases, then, will be favourably influenced by judicious vaccine treatment. Suppuration may be prevented, and the whole condition clear up rapidly. I have had two such cases clear up on prompt vaccine treatment when suppuration seemed inevitable.

II.

The other class of case—that is, that in which no external lesion can be found to account for the infection—comprises the great bulk of all cases. We may consider the possibilities of treatment under three headings and see what data we have to guide us.

Prophylactic Treatment.

The data we have here are as follow: Bacteria are able to enter the ducts and acini from outside—probably being derived from the mouth of the sucking child. These bacteria grow readily in the stagnant milk. Leucocytes enter the gland acini in response to the bacterial toxins. The leucocytes cannot act as phagocytes to the bacteria until the latter have been acted on by opsonin. There is only a small amount of opsonin in milk normally, but it increases *pari passu* with that in the blood. The resistance of puerperal women to pyogenic cocci, as measured by the opsonic index, is lowered.¹² Under these circumstances the ideal treatment would be as follows: When suckling is to cease an injection of *Staphylococcus aureus*—the usual organism of duct infections—should be administered. This will cause an increase of resistance to this organism in the body generally, and will likewise increase the amount of opsonin present in the milk. The breast should be aseptically exhausted once or twice and further contamination carefully prevented. Such counsels of perfection are not likely to be widely practised yet awhile, although somewhat similar methods of treatment have been advocated and carried out in Germany; but they none the less remain the logical sequence of the data cited above.

Treatment of Early Cases of Inflammation.

Here we are dealing with a condition in which the bacteria have multiplied to a considerable extent, the ducts are obstructed by clotted milk, and large numbers of leucocytes have invaded the infected region. The question at issue is whether the leucocytes will be killed and transformed into pus and the bacteria spread through into the surrounding tissues, or whether there is enough opsonin present for phagocytosis to be carried out and suppuration prevented.

We are at some loss to offer effective assistance with vaccines here. We may be able to obtain a culture of the infecting bacteria from the ducts; or by the use of a stock vaccine of *Staphylococcus aureus* we can materially increase the resistance of the body against this organism. This, however, is not the whole or even the chief part of the difficulty. The anatomical conditions present are to a large extent opposed to the success of vaccine-therapy in the earlier stages of infection in these cases. The bacteria are multiplying inside the ducts and acini, shut off from direct action of the body fluids by a well-marked basement membrane. They are, strictly speaking, outside of the body altogether. I was somewhat chagrined at first to find that attempts at abortive treatment by vaccines in these cases seemed invariably to fail; but, looked at in this light, it would be surprising if they should succeed.

The condition present is precisely analogous to that obtaining in cases of sycois and acne; here the bacteria are ensconced in hair follicles or sebaceous or sweat glands, in which they multiply. Occasionally they break into the surrounding tissues, causing pustulation. The acute outbreak is easily cleared up by vaccine-therapy,

but the cure of the basal infection is quite a different story.

These, then, are the conditions with which we are confronted. What are the indications for treatment? It is an open question among persons of experience whether simple bandaging or fomentations should be used. In other words, whether complete rest of the part is to be aimed at, or whether immigration of leucocytes, and, as far as possible, interchange of body fluids should be encouraged. One thing, however, remains clear—that the resistance of the body to the infecting organism should be raised as much as possible in case suppuration should occur. If this can be effected suppuration is kept within very small limits, and when the pus has been evacuated healing is rapid.

Only three cases of this class in my series came for treatment before suppuration had set in; these received injections of *Staphylococcus aureus* in doses of 400 or 500 million with the good results just mentioned above. The bacteriological diagnosis was confirmed in two of these cases when the pus was evacuated.

It may be mentioned here that the administration of vaccines to suckling women did not appear, in any case, to injuriously affect the child.

Treatment After Suppuration has Commenced.

I need not go into the question of operation; pus being present, must be let out as speedily and as thoroughly as possible, and adequate drainage provided. This is as much a canon of inoculation as of surgical treatment.

We are dealing with an area in which the bacteria have gained the upper hand over the leucocytes, and necrosis of the tissues has resulted. The localization of an abscess depends on the resistance of the surrounding tissues to the attacking organism, and this in turn depends mainly on the richness (in bacterial antibodies) of the blood and lymph stream supplying the part. When necrosis has occurred the readiest way to secure a thorough flushing of the parts with these fluids is by providing free drainage. At the same time we must increase the potency of the antibodies in the fluids we are applying to the injured area.

Fifteen cases of my series come under this heading. They were mostly sent for treatment immediately after operation. The routine treatment was as follows: There being no sign or history of a lesion of the nipple, a staphylococcal infection was diagnosed, and an injection of 400 to 800 million of a stock vaccine of *Staphylococcus aureus* was given, usually in the upper arm. Films of pus from the wound were made and the wound cultured, so that the bacteriological diagnosis might be confirmed on the following day. In cases that did well one further injection of a similar amount was given about a week later, and this was usually all that was required. Opsonic indices were not done, but if a case ceased to do well the wound was recultured and usually showed that a secondary infection had occurred. Those cases which had not been sufficiently freely opened at the outset did badly until surgical means were again resorted to, for it appears that where pus is pocketed the condition is only aggravated by the administration of vaccines. Every one of these 15 cases gave a pure culture of *Staphylococcus aureus* in the first instance.

The results of treatment were as follow: Five cases ceased to attend soon after the first injection; 1 case became secondarily infected with streptococcus, and healing was delayed for ten weeks; 9 cases were discharged healed in an average of twenty days each.

Chronic Suppurating Sinuses of the Breast.

In addition to these cases of acute mammary abscess, 13 cases of old-standing sinuses were treated; these were the result of past operations or spontaneous bursting of an abscess.

The bacteriological findings were as follow: *Staphylococcus aureus* was present 13 times—8 times in pure culture, once together with diphtheroid bacilli, and 4 times together with streptococci; 1 case gave a pure culture of streptococcus.

In treatment stock vaccines were used in staphylococcal cases, and autogenous vaccines were made where streptococcus was present. The streptococcal cases were more protracted and the vaccines not so well borne;

the difficulty in these chronic cases is frequently largely due to the presence of much scar tissue. This apparently is particularly abundant in streptococcal infections. By its contraction the fibrotic tissue interferes with the local blood and lymph supply, with the result that the contained antibodies, however abundant they may be, cannot come into contact with the infecting bacteria. The local treatment of these chronic sinuses consisted, as a rule, in the use of gauze drains soaked in hypertonic citrated salt solution, as recommended by Sir Almroth Wright.

The value of vaccines in cases of chronic suppuration is too well known to need much comment, and the results of treatment in these cases may be briefly summarized thus:

Taking an average, the time that suppuration had been going on in these 13 cases was fourteen weeks each, and they were discharged cured in an average time of five and a half weeks each from the commencement of vaccine treatment.

In one case there had been recurrent abscesses for fourteen months, and the breast was a mass of fibrotic tissue—a pure culture of streptococcus was present in this case, and cure was only complete after six months' treatment.

In another case sinuses had been present for eight months, and the patient was discharged cured in five and a half weeks.

In two other cases of six months' duration cure was complete, in one case in two and a half weeks and in the other in five weeks.

These numbers are exclusive of one case, in which treatment was discontinued. No improvement whatever was effected by several months' use of autogenous vaccines. This was a case of streptococcal infection, and the breast was riddled with sinuses. Drastic surgical measures were finally resorted to and a cure is now (November, 1910) almost complete.

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ERYTHEMA NODOSUM FOLLOWING MEASLES.

BY

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DURING the epidemic of measles which has been prevalent in Lewes since last November, I found 2 cases of erythema nodosum which occurred during the convalescent period. At the same time Dr. G. Birch found 7 cases, also following measles, as to which he kindly gave me information. Unfortunately no notes were made at the time of six of these, so no detailed account of them can be given. In most of the cases about ten to fourteen days had elapsed since the first onset of measles before the erythema nodosum made its appearance. In half the cases the first symptom was pain in the joints, followed by the erythema in about twenty-four hours. There was no history of rheumatism or contact with rheumatic fever in any of the cases, and no rheumatic or cardiac lesions were found in any of the patients. The question of sore throat before or at the time of the measles rash was carefully gone into, but it was present in one case only.

CASE I.

G. H., aged 8 years. No previous illnesses. On December 2nd a typical measles rash appeared, which was well marked in twenty-four hours; temperature 105°; a sharp barking cough, and bleeding of the gums; no sore throat; temperature normal in three days. On December 9th the patient got up, feeling very well. On the 13th he complained of pains in the shoulders and knees, followed in twenty-four hours by well-marked erythema nodosum on the shins, which disappeared quickly with salicylates and rest in bed. He was quite well two months later.

CASE II.

D. H., aged 6 years. A delicate girl, no rheumatic history. On February 1st a measles rash appeared. The temperature at

night was 105°, and was normal in twenty-four hours. The throat was very much injected and painful, accompanied by an irritating cough. There was no bleeding of the gums, and the rash was never well marked. Patient was making a good recovery until the 16th, when pains in the joints were complained of, followed in thirty-six hours by erythema nodosum on both shins, which was very painful. The rash and joint pain yielded readily to salicylates.

CASE III.

J. W., aged 8 years, a weakly boy, often having attacks of tonsillitis or bronchitis. On December 12th the measles rash appeared; temperature 103°; no sore throat but an irritable cough; the rash was never profuse. He was up again in five days, and did well till the 24th, when he complained of pains in the ankles and knees, followed in eighteen hours by the erythema on the shins, outer side of the thighs, and the back of both arms. Salicylates quickly cured the condition.

As far as I know no other cases of erythema nodosum have occurred in the sphere from which these cases have been collected. Seven of the cases occurred among the poorer class attending the hospital, and two were private patients in fairly good circumstances. These 9 cases have been collected from 300 cases of measles, but many other cases of measles have occurred in the town of which no account has been obtained.

A CASE ILLUSTRATING THE VALUE OF SURGICAL TREATMENT OF PULMONARY CAVITIES.

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ON May 4th, 1889, I reported in the *JOURNAL*, p. 994, a case of pulmonary cavity treated surgically with success, and, although cases of empyema have occurred by the score in my practice in the interval, I have found but one other case beside this now reported in which opening a pulmonary cavity and treating it surgically seemed indicated.

That it is useful and fairly safe in non-tuberculous cases where the cavities are but few in number seems established, and the following case is an illustration of its application:

P. T., aged 16 years, was brought to the Devon and Exeter Hospital from a cottage hospital in North Devon, where he had been for six months. Beyond that he had been very ill and feverish, no definite history could be obtained. He arrived here on August 6th, 1910, complaining of cough and pain in the right side of chest. He appeared ill—eyes bright, cheeks flushed, temperature 104.2°, pulse 136, respirations 36. He stated that he was getting better until the week prior to his admission, when the cough came on with fever.

The report on the condition of his chest was that there was dullness over the lower two-thirds of the right side of his chest, and posteriorly, with moist gurgling sounds. Whilst being examined the lad complained of wanting to expectorate, and immediately coughed up a large amount of pus.

This expectoration continued daily for several weeks, and was noted as being extremely offensive. At this time he filled the ordinary spittoon twice or three times a day, and he must have got rid of 6 or 8 ounces of muco-purulent material every twenty-four hours. His breath was very objectionable also. His temperature ranged from 101° to 97°, rising to 103° on August 22nd, but falling to normal the same evening. The dullness behind now seemed lower down, whilst rhonchi could be heard over the right apex. Moist sounds could be heard at the right base. He was losing flesh. It was thought that probably the condition was a chronic form of catarrhal pneumonia, and that possibly a local empyema had occurred, and he was transferred to the surgical wards.

On first seeing the case it occurred to me that the symptoms would be accounted for if he were expectorating an empyema through the lung. After waiting a reasonable time I concluded that an operation, consisting of the removal of several of the ribs and opening and draining the pleuron, would give him most relief. I operated on September 18th, and on coming down on the pleuron it was obvious no empyema existed. Introducing the finger I found a few adhesions, but on palpating the lung no hardness betrayed the whereabouts of a bronchiectasis. About an inch of the fourth, fifth, and sixth ribs was excised.

I hoped that one result of this operation might be adhesions between the lung and the parietes, for one great difficulty in treating these cases surgically is the withdrawing of the lung from the wound, from air entering in the pleural cavity. The wound was therefore stitched up, and shortly healed. The effect of this operation was not very marked, although it cleared up the diagnosis. Yet the offensive expectoration occurred regularly, and the lad became blue and strangled