Pleurisy
and
Allied Diseases of
The Chest

David Robertson Dobie
M.B. C.M. Ed.
4 High Street
Coldstream, N.B.

29th April 1885
During my first winter in practice in this a purely agricultural district I was very much struck with the great frequency of a complaint which I understand is of very rare occurrence in some parts and difficult to obtain for clinical study. That complaint is Pleurisy going on to effusion or suppuration.

For the study of Pleurisy in all its different phases and its terminations I have been particularly fortunate and the frequency of cases of effusion into the chest has compelled or rather induced me to take up this subject and present it as my thesis.

Not long ago met a celebrated London Physician and in talking over medical subjects, he remarked that in one of the largest hospitals for chest complaints in London in which he was a visiting Physician he could never get hold of a case of Pleurisy.

My cases of Pleurisy have all certain characteristics which make them differ from each other and which enable me to arrange them into The Acute and The Chronic Pleural effusions. None of my cases were of a secondary nature, I mean due either to some cardiac lesion or some liver disturbance, but all were directly traceable to a definite exciting cause and all had at some periods in their history gone through the stages of
of congestion and exudation. There had been at some times or other an acute inflammation, it might have been a slight point of acute pleurisy which is so common in ascitic females and which had been allowed to pass unheeded; or it might have been an extensive portion of inflammation which had been lighted up and which had ended in effusion and in one of the cases acute suppurition.

These cases have led me to a more careful study of the pleura's functions, its diseases and their treatment and I intend to make my paper a full and complete treatise on that subject, which may be of some use to practitioners and students as well as a thesis for the M.D. degree.

It has been said that when one writes on a subject or writes a book, it is as well to see that what he writes is worth knowing, and if he writes in the belief that the subject or information is entirely new, he had better see that it is true. I do not suppose for one moment that all my works will be quite new and original. I have not found any new disease but I firmly believe that the conditions under which Pleurisy with effusion, both merely serous fluid or pus, causes and is absorbed is still a matter of obscurity.
and great difficulty, so that I hope my paper may not be without some excuse for its publication and its subsequent issue as a book.

Chapter I The Pleura.

Anatomy: In order to facilitate the movements of one particular organ over or against another, it has been so provided that that movement will take place with the least amount of wear and tear and with the least expenditure of power. In joints it is the case and in parts where one ligament or tendon runs over particular structures, or where muscles are situated over bony prominences, surfaces smooth or provided which enable the movements to be executed without any difficulty. So there is provided in the thorax, one of the most perfect arrangements for facilitating the play of the lungs against the chest which one could imagine. We have a closed sac upon each side, that sac having its walls so arranged that the two surfaces rub against each other in such a delicate manner that there is nothing felt in the way of friction or anything to approach the idea of a sensation.

Imagine the pleurae as two sacs of bladder's blood within the chest which line the sides of the chest and pass on over the lungs. Each side therefore there is
as said, and between them there is a space, which has been exposed where the lid of the chest box has been raised. This space under the breast bone separates the two sacs from each other, contains nothing but cellular and adipose tissue, enabling the two sacs to approach closely to each other. This serous one or pleura is in close relation to the pericardium and is reflected over it and intimately connected with it. It passes over the diaphragm and facilitates the play of the lungs over that structure, following the shape of the apex of the lungs it is projected above the clavicles to a considerable distance.

The spaces between the pleura are called mediastinal spaces, named according to their position from the anterior to the posterior surface of the body. The Anterior: the Middle: and the Posterior Mediastinal spaces.

They contain important structures such as vessels and nerves and are important as forming the principal means of dividing the chest into its lateral portions.

The Pleural serous membrane then is divided into two distinct parts. That lining the whole surface of the lung. - The Pleura Pulmonalis. The Pleura Costalis is that which is reflected over the ribs. The two membranes are continuous with each other and the space which is of necessity formed between the two layers is the space in which we have to devote our attention.
attention and study, because it is within this space that the principal diseases and complaints about which we have to write take their origins, develop and remain for years. Like all serous-like the other important structures below the diaphragm, the peritoneum, the pleura is a thin sac and the whole of the membrane can be stripped off from the lungs but with difficulty, leaving underneath the areolar tissue the annulate vesicular structure of the lungs.

I cannot but refer to my old text books. Brodie, in his description of the anatomical relations of the pleura, in which he gives a clear and concise description of the movements of the lungs, and there he says: "that the cavities contained by the Parietal Pleura correspond accurately to the forms of the lungs." He also says: "that the pleura do not line the thoracic parietes quite down to the attachment of the diaphragm vis a vis that while the anterior margin of the right pleura extends to the medial line of the sternum from the level of the 2nd rib the left pleura at a point at which the sternal notch to the lung commences."

**Minute Anatomy:**—The large serous cavities the Pleura, pericardium, peritoneum and arachnoid cavities are simply expanded lymph spaces which are found in the cellular-tissue

underneath
underneath the skin. The lymph spaces communicate with each other and traversed by fasciculi which are continued underneath the cutis vera and are so delicate that they move smoothly upon each other. I have before me a physiological specimen of the normal pleura and you see a dense layer of connective tissue cells lined by a layer of squamous epithelium; the endothelial lining is continued all over and forms a complete covering to the deeper layer. When you examine with a higher power you find that the deeper layer of connective tissue is prolonged deeper and is continued into the structure of the lungs. The lymphatic vessels course along these fasciculi and finally terminate in open mouths underneath the lining of endothelium (Recklinghausen).

You have a miniature serous cavity constructed upon the same principle as the Pleura, so a Burrow underneath the skin. You have the walls composed of fasciculi pressed aside to form a dense layer of connective tissue, over and inside of this wall there is a layer of endothelium containing in the cavity there is fluid of a serous nature composed of different kinds of cells, having a pale yellow color and of gelatinous consistence. From the above
above it will be seen that the Anatomy of serous cavities generally is a very complicated study, and that it will be found to be a vast arrangement all over the body and that each cavity communicates freely with each other. So that oedemas of the subcutaneous connective tissue or the flesh, which takes place, is followed by effusion into the larger cavities.

General anaæmia or oedema was believed to be due to some obstruction or obliteration of principal venous trunks or arteries, that it was due to stagnation of the blood current. We now know and it has now been undeniably proved that some exaggerated pressure within the vessels both venous and lymphatic is the true cause of the consequent oedematous without any obliteration or obstruction of vessels. and from minute study it is found that each of the spaces communicate so readily with each other that fluid or exudation of lymphs passes rapidly from one into the other, causing not only a local but a general anaæmia. This is a condition of dropsy or effusion due to some secondary cause, about which we have little or nothing to say. What I intend to discuss in this treatise is the effusion into the large thoracic serous cavity due to a local pleuritis or inflammation.

The visceral pleura of the lung is according to Toland
and Ranvier, scarcely .06 of a millimeter in thickness, and the circulation of the blood through the pleural membrane and the alveoli adjoining, is direct, which readily explains why an inflamed lung may, and is so often accompanied by an inflamed pleura. The lymphatics of the lung and of the pleura are in direct communication with each other and so intimate is the connection that one with the other that the lung structure being inflamed you find the pleura also in a state of congestion, with proliferation of its cell elements.
Chapter II. Acute Pleuritis.

When the physician is called to see a patient who complains of a severe lancinating pain in the chest when he breathes or moves about in bed, from side to side. You are bound to apply your stethoscope over the spot which the patient can cover with the point of his finger. You find the pulse quick and the temperature is high, the breathing short and he has a troublesome, short cough, which gives much pain. He instinctively places his hand over his side to limit the movements of the intercostal or parietal pleura or over the diaphragm. His face bears an expression of extreme anxiety and at all hazards the patient implores relief. You listen over the areas and you can hear the familiar friction sound at the end of an inspiration. At this point of the respiratory movement the pain is worse, and the agony is excruciating. If no remedies were applied the pain would, through time disappear and the breathing quite calmly. Simply through the intervention of nature, if a little of lymphaceous fluid would separate the inflamed surfaces, the friction sound would vanish but the temperature and the pulse would remain high, and the condition would seem to be one of acute and
and decided improvement. You meet with those symptoms exactly as I have mentioned, in the course of an attack of pneumonia, the pleural covering becomes congested and inflamed, an extension of the inflammatory mischief from the deeper part of the surface and 'vice versa' according to Haller's Morgagni, it is impossible for the Pleura to be inflamed without the subjacent lung being also inflamed.

It will be necessary to examine into the Pathology of this condition of inflammation arising on in the course of a Pneumonia, for in order to have a rational idea of the treatment of the uncomplicated Pleurisy, we must thoroughly understand the exact nature of the process which is going on.

In Comb and Ramier's works we find it stated that in an Acute Lobar Pneumonia, reaching the surface of the lung it is always complicated by a certain amount of Pleurisy. The Pleura presents a pendulated appearance, is red and congested and soon becomes covered with a thin layer of proliferated cells which forms the false membrane adherent to the pleura and having in some cases a dull shiny appearance. In others a red, protuberant appearance and covered with small vascular trunks. This membrane...
is coagulable lymph of fibrous network holding into meshes pus corpuscles and broad endothelial cells which are flat, swollen, the result of proliferation. This membrane becomes vascularised and little fluid is thrown out but not sufficient in many cases to prevent the membrane becoming adherent to the parietal or costal pleura. This adhesion is the concrete concrectum of bands binding the lung firmly to the chest wall. These bands become formed of connective tissue covered with endothelium and are supplied with blood vessels from the structures underneath.

Both in chronic congestion of the pleura due to some valvar lesion in the heart and in acute fibrous idiopathic pleurisy we find the membrane much thickened with the formation of villous growths of connective tissue and fluid exudation.

In acute Pleuritis the parietal pleura may escape but in most cases it also partakes of the same pathological changes, fibrin is thrown out during the first day and the drain from the months of the lymphatics increases and opions effused from the second species of matter from an inflamed area, is rapidly poured into the cavity. The lung itself does not escape, but the alveoli and...
spaces formed by them, take on the action and become filled with proliferated endothelial cells and swollen epithelium.

If, as before stated, no interference in the course of the malady is resorted to, the effusion goes on increasing, breaking down membranous adhesions and separating the lung from the chest. But when resolution or absorption of the fluid begins, we find the lymphatic channels become open, the cells become fatty and are carried away in the lymphatic stream. The membranes and the numerous blood corpuscles which become degenerated and disappear. The time occupied for all this physiological repair varies in some with great rapidity, leaving scarcely any trace behind. In others a further degeneration takes place and purucent corporules are formed in great abundance. The whole of the effusion becoming purulent, and the pleural cavity a large abscess. In some nothing remains but a greatly thickened pleura adherent to the chest wall and binding the lung firmly to the chest wall, so much so that the lung seems to have been completely destroyed; in others the false membrane becomes tough and resistent and superadded to all this, there is a copious effusion which completely reduces the lung.
lung to the condition it was in, in foetal life. The lung is pushed upwards towards the mediastinal space, and is in the condition mentioned by Bronsard in his cases under the name of atrophied lung. It is a condition of atelelecsis and you constantly find in the post mortem examination room, a lobe of lung bound firmly down while the neighbouring lobe is projects up and in a state of emphysema.

In an inflamed Pleuris, we have a most typical example of an inflammation. We have active congestion, passive congestion and a condition of Blood stasis with exudation of some of the blood constituents which may become organised or become degenerated, going on to suppuration or modified inflammation. The exudation poured out possesses all the characters of lymph capable of being converted into forming organized tissue, from the inflamed condition of areolar or connective tissue. The effusion is thrown out causing oedema or to larger cavities causing dropsey.

I should wish to point out that in idiopathic Pleurisy we have the symptoms so ill defined and cause so little inconvenience that an abundant effusion is poured out in one week enough.
to fill the whole chest without producing any febrile symptoms. In several of my cases which I use to illustrate my statement, it was this the case, and it is often difficult to point out the cause of such an effusion, it may be tubercle tuberculosis of the pleura or a very low form of chronic inflammation commonly met with in the acute and in the scarfulous subjects of the present age.

Some at this stage advert to the Secondary Pleurisy which manifests itself in the course of one of the most insidious complaints which one meets with in the country. Bright's Disease of the kidney, the pathological changes are identical, but the effusion is more liable to undergo transformation into pus. I have met with several such repeated attacks of Pleurisy, passing off however to be replaced by that low form of pneumonia met with in the aged - Pneumonia Wala terminating in death. The urine distinctly albuminous of low specific gravity.

In all such cases an examination of the lung is imperatively required and also the urine, both microscopically and chemically should be examined. Many such cases
terminate in general anaemias involving both the Pleura and Peritonitis, a low form of inflammation having manifested itself in all the Serous Structures.

Roberts says, "Secondary inflammations of the lungs, endocardium, pericardium, pleura, peritoneum and integuments may break out in inflammation at any period in the course of Bright's Disease. The tendency of these constitutes one of the principal dangers of the complaint."

Of over four hundred autopsies of Bright's Disease there were found: Pleurisy - 57%, Pericarditis - 30%, Peritonitis - 46%. so that

The Pleura is the most liable of all the serous structures to be so affected. To show that an intimate relationship exists between the Kidneys and the Pleura, I find it stated in record of the experiments of Apple's, Perlo, and Zalesky that when the kidneys of serpents are excised, the animals are found to have their serous surfaces covered with mucus.

In an inflamed Pleura we have a most typical example of an inflammation: we have an active congestion, a passive congestion, and a condition of
of blood clots with exudation of some of the blood constituents which may become organized or degenerated into pus. The exudation at first possesses all the characters of lymph capable of being converted into living organized tissue.

As in the inflamed condition of areolar or connective tissue, the effusion is thrown out causing edema, or into larger cavities causing trophic.

**Treatment:** - The Rational Treatment of Pleuritis is the same as the treatment of inflammation generally. Remove blood by venesection or blood letting from any artery. Cupping or leeching. Counter-irritation by means of blisters. Rub of acrid oil over or near the inflamed area.

Constitutional Treatment. Administer medicines to unobstruct the bowels, thereby unobstruct the circulation of any exces of fluid. These medicines we have in the long list of Purgatives including Epsom. Mercurial cathartics I consider best, combined with some vegetable.

Give also medicines which act upon the skin such as the ordinary balsam of Peru mixture containing: Liquor Amony Acetati, which depress the circulation. Frasari emetici, Opium or Aconiti.
With regard to the latter it should warn some doctors to be very explicit in their prescriptions when quinine is prescribed. The Hemmings fluid is the best preparation. According the present fashion of treating cases you cannot push the antimony to the extent of nausea and vomiting, therefore I think the best plan is not to use Antimony.

Keep the part at rest, which avoids irritation and causes less pain; by strapping the chest with strips of adhesive plaster or a firm binder.
Keep the patient upon a non-stimulating dietary consisting of milk and nourishing food without wine or other stimulant.

With these fundamental truths at your back you are able to combat any attack of pleurisy and in many cases prevent the formation of much fluid and cut short a disease which may take weeks and months to cure or be healed.

To illustrate these principles in treating a case of pleurisy, I shall now record the following case which came under my notice now some months ago:

R. S., aged 18, residing at Eccles Newtownd complained of great pain in the chest, with frequent hacking cough, with no expectoral, and anxiety expressions.
expression of countenance with his hand over the
painful side keeping the thoracic movements within
bounds. He had a quick bounding pulse and
seemed in great agony - he was bled freely from
the arm followed as was to be expected by great re-
 lief. A small hypodermic was administered
and he was greatly relieved and thankful.
As the case afterwards turned out, he was suffering
from a pleuritic attack developing in the course
of the first stage of pneumonia.
By means of the hypodermic and by the bleed-
ing we bring about the analgesic effects of the
opium and have a lowering influence over the
secretion afterwards to be poured out. As in the
case of the simplest case of pleurisy, that due to a
broken rib, we apply a firm bandage to keep the
part at rest, so in idiopathic pleurisy we get a
physiological rest by effusion of fluid, relief to
the irritation and limit to the thoracic movements.
Rest to the part inflamed is brought about by the
mandated efforts of nature in every instance respec-
tively do we see this all we have the pleura in a state
of inflammation, effusion is poured out, the two
surfaces of the pleura are separated from each other
and the thoracic movements are diminished.
A dry pleurisy due to a tubercle is not always relieved by the pain given by the effusion of fluid or lymph swathing the two surfaces of the pleura, as the two surfaces of the pleura, with each other.

In the treatment of pleurisy, I attach great importance to pleuronecrosis, or blood letting, and strapping the chest.

The subject of pleuronecrosis is a subject which must demand the attention of every physician and why it has so completely fallen into disuse is due to its abuse and not to the real rationale. There cannot be any reason why the abstraction of blood should be condemned when we constantly see so many robust healthy men relieved so decidedly and so quickly by such a simple process if carefully carried out.

It is accompanied by no danger and by its means upon get boldly to the circulation, and now relieve the excited heart without having to depress or poison the nervous energy by administering medicines or giving the patient an immense amount of discomfort by giving strong, powerful doses of purgatives.

In limited dry pleuries and in pleurisy due to a physiological condition of the subjacent lung, strapping the chest has been found to give great relief, and the

The source of great comfort to the patient, Dr. Roberts gives special directions for the application of strips.
of adhesive plaster which have for their object the fix-
ing of the chest box on the side affected, retaining the
part at rest. He says,
1. It gives relief to pain and enables the patient
to cough and breathe more easily.
2. It prevents the outpouring of much fluid by
keeping the part at rest.
3. The rest and pressure aid absorption of fluid
4. It acts as a splint to the side where much
effusion of lymph exists, keeping the parts quiet
and dispelling all unpleasant sensations.
Chapter III Pleurisy with effusion.

Symptoms:—In almost every case of pleurisy a certain quantity of fluid is poured out, in many cases so small as scarcely to require more than the external application of a small quantity of Linimentum Iod. dilut.; in others it is so abundant and so copious as to require one of the most delicate operations which the surgeon is called upon to perform.

Effusions into the Pleural cavity is divisible into two classes.

1. The Acute Pleural effusion
2. The Chronic Pleural effusion.

The latter may be again subdivided into the secondary chronic Pleural effusion, or that due to Cardiac or Hepatic disease.

One cannot enter in detail into all the causes of effusions of serous fluid into the Pleura as they are too numerous to treat fully, but each cause may be found discussed in more comprehensive works or special subjects. For the purpose of diagnosing a case of effusion into the Pleura you have all the preliminary symptoms of the acute Pleurisy more or less marked— the pain rapidly disappearing to be followed by a more important serie's
series of symptoms.

Going over the examinations of the chest, you notice
by 'inspection,' first an alteration in the configuration
of the chest or of the side affected,—a flattening, a
bulging or obliteration of the intercostal spaces.
a general enlargement of the side affected, and
lastly a diminution in the expansion of the chest
wall.

By 'Palpation,' we notice that the Vocal fremitus
is absent.

By 'Percussion,' we have a dull, high-pitched note
similar to the sound elicited by tapping a solid
wall. The percussion note being dull more partic-
ularly at the lower part, becoming more reson-
ant as you proceed upwards. You notice by this
constant and steady rise any fall or increase in
the quantity of fluid. Alterations in this dull note
is brought about with a change in the position of
the individual.

By 'Auscultation,' you notice a change in the breath
sounds—They are absent or nearly so below and
ribular above. In many cases the breath sounds
are heard as if far away in the distance and
having a distinctly tubular character.

There are no crepitatus and the Vocal resonance
is absent or has the aegophonic character. This symptom is said to be most marked at the angle of the scapula, but it is quite often easy to detect it at any point over the fluid.

Displacement of organs is one of the most diagnostic features you meet with. There is displacement of the pericardial sac with the heart to the right side and upwards. The apex beat being felt in the epigastrium or further to the right side and the left side of the heart is brought more in contact with the chest wall. The heart is twisted or turned round or floated - the axis being at the base of the organ. The whole area of cardiac dulness is altered and pushed to one or other side according as the fluid is put up in the right or left pleural cavity. The sounds of the heart, though displaced, are brought more round to the front and heard more distinctly because the sternum acts as a sounding board. In a right sided effusion the sounds of the right ventricle are more easily heard, but in regard to this statement there is great room for speculation.

The resonance of the stomach is altered, much lower down than natural and overlying the splenic dulness or the latter is found lower down.
down in the abdominal cavity.

In right-sided effusions the liver is displaced downwards and can in many cases be actually felt right below the ribs in the abdomen.

By careful auscultation it is sometimes quite possible to elicit the thrill of a quantity of fluid in the chest by suddenly moving the patient. This is termed "successive" and is useful, difficultly brought out except in cases of long standing effusions or in cases of secondary effusion due to cardiac or renal disease where the effusion is watery. Where a condition of pneumothorax exists the symptoms is easily brought out and in most instances has all the characters of a churning or splashing sound.

The constitutional disturbance at first is very slight, there is little or no feverishness in an ordinary effusion and the condition may last a long time without causing much inconvenience. Time is only required to tell the patient that he is going down the scale of health. Loss of appetite begins, night sweats come on, he is disturbed with a short dry and hacking cough. Relief only comes when he lies on the affected side. There is breathlessness on exertion with sharp attacks of pain.
found in the chest. The temperature of the skin may never vary in some cases, in others the skin becomes hot and dry alternating with cold sweats.

The circulatory system feels the strain and the patient after 3 or 4 weeks is brought to bed and the medical man is sent for. The pulse is quick frequent and weak, often very irregular.

Symptoms of commencing Phthisis begin to develop while they are only those of effusion into the chest and there can be no doubt many of the cases of supposed cure of Tuberculosis are simply cases of Pleurisy with abundant effusion.

Very often towards the end of the absorption of the fluid all the symptoms of Pleurisy break out afresh, the pleural surfaces coming against each other raising the temperature, producing much pain and uneasiness.

Having given in a concise manner the symptoms which should arouse the idea of effusion, I must pass on to enumerate some of the methods which are adopted for the speedy absorption or removal of this fluid in the chest.

I have given the treatment of Acute Pleurisy in a previous chapter, I must now pass on to a consideration of first. Our endeavours to pro-


more absorption of the fluid.

Second. Removal of the fluid if it cannot be absorbed.

Third. Relief of any intercurrent complications which might arise.

Fourth. The keeping up of the patient's strength to a high pitch.

First. Endeavour to promote absorption.

Now enter upon a subject which has given rise to wide discussion—are we justified in subjecting the patient to a medicinal course of treatment when we find a large quantity of effusion into the chest following on a sharp attack of pleurisy? I say that we are bound in an acute case to aid the efforts of nature by employing the old line of treatment—by repeated applications of Heping Blisters, or by the application of Luminal of Iodine and the administration of medicines which act upon the skin—the keducep or the Bowel's.

Iodide of Potassium is resorted to, and it undoubtedly does possess the power of stimulating organs for the elimination and absorption of fluids poured out into serous cavities. It combines the diuretic properties with the
the power of increasing the capabilities of the lymphatic system to draw into itself and throw out again through other organs any effusion. Digitalis, a powerful diuretic and stimulant to the circulatory system, is also of value, even not in small doses of the tincture, but in large doses (3f) of the infusion made according to the Edinburgh Pharmacopoeia.

The following is a good diuretic mixture:


Medicines which act upon the bowels are not advisable as they cause the patient extreme exhaustion and discomfort.

Now what I hold in the treatment of such cases is that in all chronic effusion, where the history of the case points to some months back, you are not entitled to subject the organs, either to taxed to their utmost, to the trouble of throwing out effused fluids where we have instruments such as the aspirator, diureticians, or that made by Rt. Mathews, Filb., similar to the instrument for tapping an ovarian cyst, which can with perfect safety remove all fluid from the chest, affect a speedy cure, even if all the fluid
fluids had not been removed.

In a pamphlet giving the full particulars of a discussion on this subject at the meeting of the British Medical Association in Manchester, 1877, Doctors Hulsen Fox and Clifford Albutt pointed out the great advantages of this method of treatment but it was unanimously recommended to hold back the operative interference until some future time, capable men to whose opinion great deference ought to be given laid down the rule, that this operation of paracentesis thoracis ought not to be held as a routine practice.

From the cases which I have seen both here and elsewhere in Greenwich I do not see why you should not adopt this method of removal of fluid in every case. Can there be any objections to have this fluid brought at once into a vessel through a tube into an air-tight vessel, without allowing it to be instilled through the kidneys or through the bowels in this chapter I do not enter into the subject of paracentesis in cases of Empyema, for in that there can be no manner of doubt, for evacuate the pus, you must and that early and drains the cavity by means of a drainage tube; but it is in those cases where there has been no rise in temperature
any more than what we might expect under the cir-
cumstances. Where there has been no rigor, where
the respiration is not growing more hurried, where
there is no sign of pointing, and where the fluid is
neither increasing or decreasing: it is in these cases
that I wish to advocate the employment of para-
centesis at once, and I believe that we will have
more the interest of our patients at heart if we e-
vacuate the fluid early. What do we find in
the surgical world every day around us in regard
to effusions. E.g. into the knee joint, where there is
large effusion and much swelling with stiffness of
that joint. I advise early evacuation of the fluid
and you diminish at once the risk of the effusion
becoming pus; repeated aspirations prevent pus
from forming and you have the serous menibane
restored to its normal condition in a short time.

What would be in many cases, I do not say in
case, be the result if you simply allowed this ex-
tensive effusion to be absorbed, all favor to have van-
wished? you would have a chronically inflamed
cuff joint constantly getting worse on the slightest
exercise: the same in the pleural cavity, if you
allow the fluid to remain you would certainly
have a lung whose expansive power would be
Greatly.
greatly impaired, and in fact in a great measure bound down to the chest wall and the diaphragm. The surface of the lung and chest wall would present the characters of a thickened layer of lymph from 1/2 inch to more in thickness. If you remove the fluid early you reduce to a minimum the risk of having a lung bound down and there will be no retraction of the ribs as you fluid immediately the operation is successfully carried out the lung rises up and fills the space previously occupied by fluid. Can anyone believe in such a statement as that made by Professor Vogel of Dorpat in his Lehrbuch der Kinderkrankheiten, 1869. iv. Ed. p. 263 "I have not met with any instance where paracentesis was urgently required and have therefore never had recourse to it." With regard to that statement I should simply say that in my opinion it contains as much sense of knowledge as the statement of rather the practice of older physicians who sat for three or four days with the child's head lying in the pelvis or pressing against a resistant perineum of the mother. Causing the poor lying in woman much needless suffering, when the application of the forceps would have terminated delivery in a very few seconds or minutes.
The rules which guide me in its performance are—
wait till the temperature and febrile state subside
and you have made up your mind that there is a
considerable amount of fluid present. About two
weeks will be sufficient time to wait.
If there is urgent dyspnoea and great displacement
I should advise early tapping.
In children I should tap the chest four or five
days after the first appearance of the fluid if there
was no appearance of its subsiding under the absorb-
ent treatment.
If recourse to this mode of treatment was resorted
to at any early date you would find recovery
to take place more speedily and more surely.
As to the mode of performance of the operation
it will only be necessary to point out the site of the
puncture and the precautions which are to be a-
dopted.
There is a diversity of opinion as to the point between
the ribs which one has to penetrate. Some recom-
mands between the 4th and 5th ribs at the inner
border of the Latisimus Dorsi. (Broadband)
The thinnest muscular area of the 5th space
in the line of the angle of the Scapula is also
recommended.
recommended (Mr. Porte).
The 5th space in the mid axillary line (Gricksen)
The 6th space in the mid axillary line.
It is obvious that in penetrating the pleural cavity our main idea is to avoid any injury to important viscera, and in order to avoid this it is necessary to know the displacement of organs.

Having made up our minds as to the point at which the needle should be entered I advise the employment of the ether spray so as to freeze the surface and diminish the pain of the primary introduction. As to the instrument I do not think that we have a more perfect instrument than that made by R.H. Mathieus et Fils. Paris, which contains a pump for exhausting a bottle, and different sizes of needles round as to remove fluids of any consistency. The bottle having been filled and more fluid removed you have little corks which can shut off the flow and prevent the entrance of air into the chest.

It is an exceedingly simple apparatus and simply requires great care and attention in the cleaning. The needle before being introduced into the chest should be thoroughly cleansed by carbolic acid and rendered quite absolutely aseptic.
After you have exhausted as far as possible the pleura of its contents you apply over the punctured wound a dossel of lint soaked in Collodion and kept in position by strips of adhesive plaster while over and above that you apply a firm bandage which keeps the movements of the ribs and pleura in a comparatively quiescent condition.

The removal of fluid from the chest is generally followed by distressing cough and pain, easily accounted for by the reflex irritation set up by the two pleural surfaces coming together after removal of the fluid. The administration of a sedative, either in the form of Nepetae which I consider the best opium preparation or a good full dose of Bromide of Pittassium will as a rule very soon relieve this condition. It has the effect of restraining any reflex irritation and it soothes the patient after such an operation which in his eyes he considers very serious and grave.

There are certain little points in the performance of this operation which must be attended to first. Keep the point of the instrument mobile downwards and do not keep moving it from side to side to seek for more fluid. If the fluid does stop, carefully withdraw the cannulae very slowly.
little distance, and you may find the stream commences to flow at once. In other cases it does not do so as the cannula is blocked up by a small shred of detached fibrin which has been floating about in the fluid.

Second. You must carefully watch for the moment when the lung rises up and meets the cannula in the pleura. Injury to the lung is very likely to occur if care is not taken, because a sudden cough or sudden movement would drive the thin surface of the lung against the sharp pointed instrument.

When you have removed a considerable quantity of fluid from the chest, you withdraw the cannula slowly and quietly, and at the same time have the instrument protected by collodion and cotton-wool. When the point of the instrument is fairly out, press over the small punctured wound the piece of cotton wadding and cover the whole part with a strip of plaster.

If recourse to this method of treatment be taken early we will find in our practice that there are very few cases of Empyema.

In older works on this subject I have been much struck with the fact that little attention was paid to the serous fluid poured out; and nearly all the
The cases where paracentesis was performed the fluid discharged was pus. If we operated early as I said before we would not have many cases of fistulous openings in the chest discharging for months as unhealthy pus and ending in rosy degeneration of important organs.

The history of pleurisy with effusion, acute or chronic shows that doctors have not examined into the true nature of the disease, and its importance in relation to important organs. The effusion is merely the result of the effect of the previous inflammation, and many cases of pleurisy terminating in an abscess have simply been cases of effusion neglected. I have no hesitation in saying that many of the cases of insidious phthisis in previously healthy individuals have turned out to be cases of pleural effusion becoming a pulmonary abscess. I cannot in this paper enter more fully into this wide field of study but I advise everyone who is fortunate enough to have a copy of the Edin. Medical and Surgical Journal, Vol. 21, 1824, Broad St. Brown's paper on the pathological characters and sanitability of consumption.
Mr. Irouseau says "To justify the employment of Paracentesis of the chest in Pleurisy with large effusion it is necessary as a first step to establish contrary to the expressed opinion of Mr. Louis that Pleurisy with effusion is sometimes fatal.

I have no illustrative cases of death from Pleurisy with effusion but from what I have read I can express my firm conviction that the extended use of the aspirator will, not only be the means of saving life but of cutting short a patient's illness many many months.

Illustrative Cases:-

J. J. act. 146. Occupation a drayman gives an obscure history of having been attacked four weeks back with a severe pain on the left side, shivering and feverishness. He stated that his occupation is one which exposes him to damp, especially about the lower extremities; that upon the particular occasion he had been out the whole day in a drenching rain and had been standing in a large quantity of water with damp clothes. Day after day did this go on and he never gave up until the pain became so severe. He stayed at home and applied mustard, returning again to work in a few days he carried on his employment with great difficulty, complaining of breathlessness and palpitation on going up
a hill or walking home from his work. He obtained medical advice and there could be no difficulty in making out that the patient had had an attack of pleurisy and that now the chest was full of fluid. Dr. Henderson and I determined to remove the fluid by aspiration immediately and the operation was performed successfully the next day. Two quarts of straw-coloured serum was removed which coagulated into a jelly a short time after exposure to the air.

The condition of the man before operation was as follows. The heart's action was quick and irregular, there was great embarrassment of the breathing. He had an anxious expression of countenance and there was a severe hacking cough, with no expectoration. He could only lie in the semi-recumbent position and upon the left side. On percussion of the chest, there was a perfectly dull note on the left side, as far as we could ascertain. On palpation there was diminished expansion and there was absence of vocal resonances. Auscultation there was distant tubular breathing. Absence of vocal resonances, but at certain points had the aegophonic character. Over the right lung there was an increase in the breath sounds. There was displacement of organs. The heart was beating on the right side and in the epigastrium. The stomach resonances were...
was below the ribs. There was loss of appetite and feeble digestion. The termury organs were sluggish in their action, little urine being passed. High in specific gravity and containing abundance of red 
dilutes and phosphates. But no albuminuria.
After the operation the patient expressed himself as being greatly relieved and he could lie in the recum-
bent position in his great ease. He was ordered to take a diuretic mixture containing iodide of 
Mall.
Next day, the patient was very much better. The skin had acted profusely. The urine had almost doubled 
itself in amount. The breath sounds were much better heard and on examination by percussion you found 
the lung resonance had considerably increased.
Gradually the lung resonance increased and before long became almost normal. The further pro-
gress of this case was uninterrupted and with the exception of one or two points of coarse friction 
due to the bands of lymph, nothing of the abnormal condition could be heard. He got up out of bed 
in about 10 days and within four months of the 
first onset he was doing some light work and 
within ten months he was at his usual occupation 
of draining on the fields.
In this case, nothing could have been more satisfactory.
ory and the question now arises - was it absolutely necessary to employ Paracentesis? Would it not have been better to have given the ordinary remedies a fair trial in the first place? From the whole circumstances I think the medical man, apathetically, from the condition of the patient's pulse and dyspnoea was justified in letting out his abdomen of fluid and giving relief to the patient as soon as possible. I hold that Paracentesis in a case like this ought not to be employed as a "dernier recours" but ought to give it a more dignified place and give it a fair trial without subjecting the patient to a long and expensive treatment. Dr. Reggie held, and I quote from him: "I agree in the criticisms by Celsius — This question is one which should not be answered by statistics but rather by the careful consideration of individual cases. We are taught to give remedies a fair trial and judge from the condition of the pulse and respirations whether or not we should tap the chest. These are most important points, but I hold that we ought more to look to the pathological condition in which the lung and pleural cavity are in. We have a lung pressed firmly into a solid mass like tawd, and we have also
large and firm adhesions being formed, contract-
ing and gradually impeding the expansion of the
chest and lung when absorption of the fluid is going
on. There can be no doubt that in a pleural effusion
the risk of death taking place at any moment is very
great, as illustrated by Dr. Begbie's case where after
having made a careful examination, intending to
return next morning to aspirate, he found that the
patient had died throughout the night before he could
even reach the house. There is also an important
note on the formation of pus taking place itself.
fusion with the ultimate formation of empyema.
The presence of this foreign body in the pleural space
of itself sufficiently to cause death, but there is ample
evidence to show that the whole of the organs are liable
to be affected reflexly, more especially the heart.
Through the vago-sympathetic. As to the risk of air entran-
ing the chest there is none, because we draw the fluid
into a vacuum and by the application of collodion
over the fractured wounds we most effectively pre-
vent the entrance of any forms of putrefaction.
Even if some air did get into the pleural cavity there
would be little harm done. According to Dr. Südlich
of America, he says: "Experience proves that the ad-
mission of air into the chest in these cases is attended
with
with no serious inconvenience. Dr. Begbie says, "He never
said a little air in the pleura do any harm."

As to the risk of sudden syncope of the heart during the
removal of fluids, I believe there are none if one or two
precautions are taken. Administer before operating
one tablespoonful of brandy or whiskey, or give one or
two inhalations of ether out of the bottle which contains
the etherizing fluid; and I believe we ought generally
to freeze the point to be punctured. Let the patient
lie in the semi-recumbent position. In bleeding I
advise the patient always to be erect as syncope is
sure to come on and that is the signal to stop.

In tapping I advise the patient always to be lying.

R.D. 1st. 29. also a draper by occupation,
sent for me complaining of great weakness, loss of
appetite, no pain, profuse sweating at night, which
hacking cough, diarrhoea and vomiting, all the
symptoms of acute tuberculosis. I understand
that his illness dated back some 8 months, at
least it was not in the summer when I saw him
and he had not been at his work since the winter.

He had been sent home with the distinct impres-
sion that he was suffering from consumption
and he had all the symptoms of the disease in
a most marked manner. I found the patient in

260
The following condition. Pulse and respirations were quick and feeble. There was a short hacking cough with a peculiar sense of immobility in the left side, sweating most profusely. Tongue loaded with a thick coating. There was loss of appetite, headache and vomiting and he could only lie up on the left side.

On inspection, there was considerable bulging of the chest laterally and there was obliteration of the intercostal spaces. There was absence of vocal fremitus on palpation and absolute dulness on percussion. On auscultation, the breath sounds were entirely absent, and there was absence of vocal resonance. The heart action was feeble and irregular. It would take many pages to give in detail all the symptoms which this patient displayed, but I diagnosed that it was simply a case of Pleurisy with effusion, and gave a very hopeful prognosis. In this case I tried the effect of iodide of Jodammon, and found that it increased the excretion from the skin and from the kidneys, but there was still no difference in the fluid in the pleural cavity. I tried it for 10 or 12 days, and at the end of that time, I deemed it advisable to aspirate at once, which I did, and removed the
the fluid to the amount of over 40 ounces. This fluid had a dull cloudy appearance and a peculiar smell. On examination of the fluid, no pus corpuscles could be detected, so a very hopeful prognosis was given from that reason alone. From the very hours of the operation, the patient never had one bad symptom and he was going about outside three weeks after, in delicate, but in gradually increasing health, much to the astonishment of many who saw him before and after the operation. There is no alteration in the configuration of the chest when I last examined him.

Now in this case as in the other, only one single tapping was required. And I account for this excellent result by the fact that in every case of effusion into a second cavity as the pleural plane when nature is able to absorb the fluid in the course of 24 hours, if you give her a fillip. I have met with several cases where nature was endeavouring to her utmost to throw off the fluid. She succeeds so far and if only a little help was given the fluid would soon disappear. Often however the strength fails to keep up with the demands upon her and more fluid is thrown out, at last the chest fills and the strength gives way.
way. Upon tap the Pleura and give her a filip and the process of absorption starts afresh and goes on without interruption to a successful termination. In this case the lung was compressed to the spinal column and on the withdrawal of fluid the lung expanded giving rise to a cough and slight expectoration.

By tapping two important results were avoided. First. The Prevention of the fluid becoming pus.

It was quite evident that there was an alteration in the character of the fluid and in the course of a few hours the whole of it would have undoubtedly become most suspicious.

Second. The early removal avoided the possible injury of one or two of the lobes being bound firmly down to the spinal column by adhesions.

In these two cases it is extraordinary how in the course of time, all the symptoms passed off and how the condition of matters yielded to treatment.

W. K. aek 29, a tall individual, a labourer, came under my care last winter 1883-84 and the condition of the lung and pleura was great to great speculation as to the nature of the malady which affected him. He had been very carefully treated by Dr. Brodyfoot
of Newbiggin by the Sea, for Pleurisy on the right side. and had been tapped three times. At the time Dr. Henderson of Coldstream and I saw him, he was extremely weak and emaciated, had lost flesh, strength and colour, and had not made such a satisfactory recovery as we should have wished.

A careful examination of the chest elicited unmistakable evidence of disease upon the right side. There was dulness to percussion and diminution of the breath sounds. There was pleural grating or rasping. large crepitations at certain points and frequent attacks of severe pain. Pulse ranging between 100 and 120. Temperature generally 100.

I deemed it advisable from the history of the case, from the physical signs, that a needle be introduced for the object of ascertaining more definitely the nature of the fluid. We found no fluid. After waiting some considerable time for the object of noticing the exact course of the disease, we again introduced the exploring needle, but again attended with a negative result. The heart was large, feeble and beating at the junction of the 5th rib with the sternum on the right side. There was a frequent cough but no expectoration.

About two months after, the patient had considera-
ably improved under treatment by blisters and dissec-
abreased medicines, and he was able to go and do
dome light work about the roads.
The physical signs of the right side continued much in
the same condition, and after six months from the
date I first saw him, he had improved in appetite,
flesh and colour. Strength was greatly increased,
and he was delighted to get out.

In December of 1854, we noticed a decided change
on his condition. He found himself going gradu-
ally down and was compelled through exhaustion
to take to his bed again. The chest was in al-
most every particular, the same as before; only
there was further retraction and falling in of
the intercostal spaces and of the ribs. There was
great prominence of the scapula on the right side.

In his general condition was the great change.
He was sweating profusely; his skin had a dus-
ky leaden hue, he was the very picture of misery
and when Dr. Turnbull and I saw him yesterday
April 26th, his condition was one which would
excite the greatest sympathy. Nothing gave
him relief and at present he is getting weaker
and weaker, and this condition will go on un-
til he must succumb. The nature of this

Condition
By permission of Sir Andrew Clark, Bart.
M.B., London.

CASE XI

FIBROID PHthisIS
ORIGINATING IN DRY PLEURISY
condition naturally excites the attention of everyone. He is dying of Phthisis, and yet there was a sight which would show the lung tissue. It certainly is not malignant disease, although it has all the appearance of such.

In the British Medical Journal, Mar 28, Dr. Andrew Clark begins his final lecture on some points in the Medical History of Primitive Dry Pleurisy and in his cases he quotes one exactly similar to this case of mine. Case XI. In every particular do they correspond most closely, and from a careful consideration of this lecture I have no hesitation in coming to the conclusion that we have in Mr. K's case, a condition denominated fibroid Phthisis, and with Dr. Clark's permission I attach the plate showing the condition which one would meet with, in the present thesis. It is a case of fibroid Phthisis originating in Dry Pleurisy.

The pleural cavity is filled up with this dense layer of false membrane. It is becoming harder, tougher and is extending into the pleural membrane and cannot be detached from the subjacent pulmonary alveoli. The fibrous material is extending along the intertubular network.
invading and crushing the lung. Only at some points is air entering the alveoli. The left lung is in a state of emphysema, and as yet no points of consolidation have manifested themselves.

As regards treatment in this case, little need or can be said. We have advised gentle exercise and live principally upon milk with about two tablespoonsfuls of whiskey throughout the day, and be ready to check any drains or loss to the system which might at any time arise.
Chapter IV  Empyema.

Before giving my experience of cases of Empyema, I may be excused if I give a brief outline of the history of Paracentesis in cases of Empyema and extract the following from an able paper on this subject by Dr. Beggio.

In the Hippocratic Treatise, ΤΗΡΗΤΙΚΟΣ ΝΟΥΣΩΝ, TO ΔΕΥΕΡΩΝ, Sec. 29, Secund. to a work which there is reason for believing, although not composed by the illustrious fathers of medicine himself, was written by one or more of his contemporaries, or by some among his immediate disciples on the school of Cels. There occur two most interesting and instructive passages: the one having reference to the method by which the existence of pus in the pleural cavity or Empyema as known to no in the present day, is to be recognised, while the other describes the operation by which that condition is to be removed. Under the former head it is directed that after the patient is carefully washed with warm soaps, she is to be placed in a firm seat, and his hands held by an assistant. The physician meantime, taking him by the shoulders, shakes him, and carefully listens.
listens to determine on which side of the chest is some occasioned.
Again in treating of the means of cure, it is directed that recourse to the operation is not to be had before the 15th day from the commencement of the effusion. Where pain is felt and swelling of the sub-cutaneous tissue is most conspicuous and shows no signs of abatement, the needle of the aspirator ought to have the preliminary duty to perform, before the opening into the chest is made.
A preliminary incision through the skin and sub-cutaneous tissue ought to be made, and the penetration of the pleura be effected by a sharper and more pointed instrument protected by a piece of cloth. In some cases the opening is made through a rib and not through an intercostal space at all.
When a sufficient quantity of pus has been permitted to flow, the wound must be closed by a piece of cloth with a thread attached. Daily a similar quantity of pus is to be removed and this is to be repeated until upon the tenth day of the disease the whole of the collection of pus has drained itself away.
A mixture of tepid wine and oil is then to be
poured in through the opening for the purpose
of cleansing the lung. This part of the opera-
tion is to be practised twice in the day, the
suction of the morning being withdrawn
and a fresh supply introduced. At length
when the pus has become clear and thin.
a metallic sound is to be introduced, the
size of which is to be gradually lessened and
the wound permitted to cicatrize.

There can be no doubt about the fact that the an-
cients were fully aware of the conditions under
which Pleurisy with effusion terminating in
pus was to be recognized and even in the pre-
sent time there is no doubt that there was a great
deal of originality in the succession of the chest.

It is better known as the most important
sign of Hydro-pneumo thorax to which refer-
ence will be made hereafter when speaking of
Pneumo thorax.

Hippocrates held it as the ready diagnostic sign
to distinguish between water and pus in the
chest and he also held that when there was
much sound, the quantity of pus was small
as compared with when the sound was feeble.
He did not pay the attention which was needed to note that it was necessary for air and fluid to be mixed before a splashing sound was heard and although it was a mistake upon his part we are nevertheless bound to admit that there is due to his observation great admiration and respect. The study of such writings are pregnant with great interest, I shall simply touch on the operations which at that time was employed to give relief to sufferers from this complaint.

Hippocrates, Galen, Celsius, Celsus and other ancient Physicians all performed the operation of opening the chest but there was little said of it as a means of cure and there are few statistical accounts of few, consequently little can be learned from recording ancient history. But we learn that the actual cautery was the agent which was principally used afterwards the knife came into use and in the middle of the eighteenth century by means of the trocar and aspirator. As far back however it is recorded by M. Gerson that Suidi performed the operation by means of the trocar and nearly a century before surg-
The wound inflicted by the tréar was considered violent and that there was great risk of wounding the parietes and of piercing the lung, if fell into durance. This accident we happily know nothing of now, and the tréar is used invariably for serious effusions, which Laennec says ought only to be used when the effusion is very abundant from the beginning and causes local oedema of the affected side. This he calls acute Empyema and secondly when the effusion has become chronic, it is to be used and to be had recourse to only as an extreme measure and when there is oedema and great feebleness of the patient.

Bringing the history of this subject down to the present time, we find many papers written, many opinions expressed, many counsels given as to its performance and records of many successful results.

In Vienna, in Berlin, in Paris, and in our own country Dr. Hamilton Roe and Dr. Hughes of Guy's Hospital have placed valuable papers.
papers at the hands and within the reach of practitioners and brought the benefits of early operation before the minds of medical men, and without easy method of distinguishing between serum and pus. There is a growing confidence in the operation and few there are now who will not even in the country districts adopt it as the established form of treatment. But I must here advert to the great success which attends operations of Thoracentesis for purulent effusions by employing Lister’s antisepsics in one form or another. The Carbolic Spray, the Carbolic oil dressing or large quantities of Maw’s Carbolic tow wrapped round the chest have contributed greatly to the safety of the operation and as in opening effusions into the knee joint with perfect safety, is the common practice so is with the operation of opening the Pleura. I am tempted to allude to the writings of a distinguished country doctor in this country when he says in recording some reminiscences of his practice...

"...year the chances of success of antisepsic surgery are so small in country practice..."
that it is apt to be valueless.

"He says, I can picture to myself such an one (a young doctor) before setting off up a mountain or through a deluge of rain or summer, or in an "angling abroad" in winter for a sick house on some lone hill side bravely strapping to his shoulders or otherwise disposing about his person or saddle. This enquirist in defence to resist the attack of micrococci and blood away the bacteroids." Or the usual cry of some old physicians against any new treatment. Now the less in the case of Empyema, which I record notwithstanding the purely, quantity and rapid movement of air round my patient, it was undoubtedly the means of bringing the treatment to a successful issue and although the pus might not have been perfectly and absolutely aseptic, the freshness which such a spray produces in an apartment or in a box-bed is a great comfort to patient and friends... As the paper proceeds however, we find the Doctor coming to the conclusion that in all operations involving serous membranes or those of the fundus, abdomen or thorax, no other method could pos.
possibly give such invariable good results."
I will now briefly relate the particulars of one remarkable instance of acute empyema which came under my notice and in doing so shall be led to offer a few observations on the special points in the treatment of this complaint.

R. D. aged 8 yrs. a school-boy residing at Tunbridge Wells, came under my care on the 17th August 1883. I found him suffering from acute pain not outside the apex beat of the heart. Intense dyspnœa and wearing a most anxious expression of countenance. Nothing could be made out in the history of his complaint beyond the fact that he had been down at the river-side with damp feet, fishing and loitering about the day before. He came home feeling ill, shivering and very feverish. On examination of the chest nothing could be made out except by auscultation when it was quite evident from the friction sounds that he was attacked with pleurisy. His tongue was coated and he had been very sick and vomiting. His bowels had not been moved.

Ordered leeches to be applied over the painful spot. Two were applied and a certain amount of relief was given. Warm fomentations were often
wards to be applied and one teaspoonful of mixture containing Specia nauha, antimony and liquid ammoniac acetate, was to be administered after the bowels were moved by Calomel and Pulv. Jalap. Co. This powder acted freely and reduced the temperature from 104° to 102°.4. in the evening.

18th. Pulse 120. Temp. 103. Fright was very distinct. Tongue very foul. Bowels had acted through the night. Sweating profusely. No dulness could be made out.

19th. Pulse 120. Temp. 102.8. Dulness posteriorly no pain in the chest. Breathing not laboured or hurried. was feeling better. Bowels had not been moved. Ordered a continuation of poultices as there was intense pain when the warmth was removed.

20th. Examined the chest most carefully and found that effusion was being rapidly poured out. His temperature was down to 100. Pulse was still very high. Ordered him another powder of Calomel and Jalap. and a fly blister to be put on posteriorly. To continue with the medicine as before.

21st. Powder had acted very freely and was still acting. Was in hopes that the effusion would stop. Temperature 100.4. Pulse keeping very high. Blister...
had risen very essentially and he had no pain whatsoever. Ordered him a mixture of Magnesia and Cardamons for the Stomach. Diet to consist of milk, eggs and beef tea.

25th. Dulness in chest becoming very marked. Heart displaced to the right side and the heart sounds are further from the chest wall. Breathing heard at a distance tubular in character. Vocal fremitus heard. Dulness extending up to the angle of the scapula. Breathing not much laboured. Informed the parents that there was a large amount of fluid in the chest. Ordered an enema and go on with the diuretic mixture of the salts of Phosph.

Temperature 101°. Pulse keeping very hurried.

26th. Breathing 30 per minute. Bulging of the left side intercostal spaces obliterated. Apex beat in the epigastrium, strong and powerful. Stomach resonance was away below the ribs. The liver dulness was also considerably altered and extended below the ribs for a considerable distance. Dulness of the chest on the left side extends right above the clavicle.

29th. Consultation with Dr. J., who examined the chest and though I strongly urged the aspirator to be used, he would not give his consent. I was
to wait and try an expectant plan of treatment 14 grains of iodide of potassium with iodine paint.

Sept. 1. Dr. Henderson and I had a consultation and the following clinical points were made out with great exactness.

Lung pressed right to the spinal column, and in a state of consolidation from pressure. Absence of vocal resonance on test; absence of any trace of breath sounds. High temperature, quick pulse; absence of pectoriloquy. The heart was displaced to the right side. Apex beat to the right of the epigastrium. Stomach resonance pressed right below the ribs.

Diagnosis: Pleural cavity filled with pus.

Sept. 2. We decided to perform the simple operation of tapping the pleural cavity. Between the 7th and 8th ribs at the angle of the scapula the large trocar of the aspirator with the large cannula was introduced, and about 30 ounces of pure aseptic tunable pus was removed. As the pus flowed out, the heart resumed its position in the left of the chest, the lung rose up to the chest wall. The breathing was heard most distinctly beneath the ribs, but it was evident from the robbing sound that there was left...
pretty thick layer of pus. The pus was white and had a smell like warm new milk. The last portion which came away had a slight admixture of blood. There was a marked decrease in the number of the respirations and in the heart pulsations before we left the room.

Sept. 3rd. Cheeks now very red with sweat drops over the brow and face. Temperature had fallen to 98.6. Pulse 98 - 100. Respirations 30. No cough and no expectoration. Breathing much easier and had had good refreshing sleep of 8 hours and had partaken of some nourishment throughout the night. The breathing was very distinct but there were friction sounds in great abundance. The movements of the ribs were very distinct and there was bulging of the intercostal spaces. Ordered half a teaspoonful of the iodide of Potass. mixture and half a teaspoonful of Port wine three times daily after his diet.

Sept. 4th. Temperature still normal. Tongue is cleaning beautifully. Bowels had acted and his condition is one of great improvement.

On examination of his chest I found the sepalae quite distinct, though previously it had been obliterated. The percussion note was dull upon deep
deep percussion but upon light percussion you only got an impaired note. The breath sounds were bronchial, accompanied by rasping sounds. Vocal resonance much better, though not perfectly normal... The lung had expanded and filled the cavity of the chest and was free from pneumonic consolidation. I judged that the visceral layer of the pleura was very much thickened and that the lung was of itself free from disease. But it would take a considerable time before the pleural space was free from the fluid which was present.

Prognosis: That he would get quite well.

Treatment: Good food and to take Dr. Ferris phosph. Co. and Dr. Lacto-phosph. Calcis half a teaspoonful of each three times daily.

Sept. 5th. Temperature has risen quite unexpectedly to 100. Pulse 120. Tongue clean and moist but the chest shows no signs of refilling. There is dulness and the spaces are obliterated to a certain extent posteriorly. The ribs do not expand so freely. But there is something going wrong again... for the heart's position was altered and the spleen was beginning to appear where the stomach resonance had been. The chest was refilling with pus. But as yet there was not any...
Sept. 6th. Had a consultation with Dr. Turnbull who said we ought to wait and continue as we had been doing. There was not sufficient dyspnoea to warrant us in aspirating again or making an opening into the chest. I had everything ready for opening the chest; but nothing would tempt Dr. Turnbull to give chloroform, from the fact of one lung being comparatively useless and the heart was displaced outwards and working under great difficulties.

Prognosis: A slight change. One of extreme gravity.

Sept. 7th. Walked out and found the baby in a high fever. Temp. 103. Great difficulty in breathing. Dr. Henderson came out and after everything was ready for opening the chest, the ether was failed and we did not like to cause the boy much suffering. So we introduced the trocar and cannula and removed about one pint of bloody pus.

Sept. 8th. Temperature down to 100. Is again considerably relieved.

Sept. 12th. Dr. Henderson and I found the temperature again away up and the chest re-gelling. We made up our minds to operate.
The chest was carefully examined and all the points were made out with minute accuracy. The position of the heart, the spleen, the liver, the stomach, &c., &c., and we diagnosed that there was still a large quantity of pus in the boy's chest which would need to be removed not by the aspirator but by means of the knife. Accordingly everything was prepared, and the carbolic spray turned on. We used the latter spray, and the boy did not feel any pain. I made an incision through the skin, between the 4th and 5th ribs below the angle of the scapula, down to the pleural serous membrane, and before entering a knife between the ribs into the cavity, watched for any bleeding. A plunge of the knife showed that there was a great quantity of pus, quite aseptic. I then introduced a director with a probe pointed. Bistoury enlarged the opening and introduced a drainage tube. This tube was carefully guarded by wire. The whole was covered over with an aseptic dressing. A little morphia administered and the patient carefully watched. His temperature had already commenced to fall before we left.
None

Robert

Occupation: School boy

Residence: [Redacted]

Age: 8

Disease: [Redacted]

Remarks: [Redacted]
room. We ordered 5 min. of neperthine and to be repeated if he should be very restless or have pain.

Expt. 14. We found the temperature down to 96ø. His pulse weak. Skin moist. Ordered Brandy every 6 or 8 hours. His bowels were cotwet and we ordered the friends not to be giving purgatives but to wait patiently.

The case went on gradually more satisfactorily and we found that time was only required for him to become perfectly well. I shall pass over several days and on the first of October we found the matter in the chest very septic so we determined to syringe out the cavity with a solution of Carbolic. This was done by means of a firm elastic catheter and syringe. Upon one occasion this set up coughing and there was expelled from the cavity three large black masses of putrid matter.

At next dressing which was 2 days after we found a marked difference in the condition of the discharge. Several large lumps of matter were expelled.

Oct. 6. Again dressed and the cavity syringed out. A mass was thrown out which seemed to be comparatively aseptic. The patient's health was
was rapidly improving.

Oct. 9th. Discharge very much diminished in quantity and there was no syringing required. We allowed the dressings to remain on for 3 days and on the 12th we found no discharge at all. The drainage tube was firmly fixed into the wound by granulations and it was with difficulty extracted. We removed the drainage tube and did not again insert it.

We left the chest in the following condition:

Slightly diminished movement. Percussion note higher than on the right side. The lung is heard to expand quite freely and the breath sounds, though only slightly diminished, are better on the right side. The heart is in its right place, and its sounds are heard to be strong and regular. All the organs are in their right positions.

I have repeatedly examined the lung of this little patient and the thickness of the pleura is disappearing; and he is very strong and well. Three months after the operation he was out and going about and he returned to School in March, walking here and back every day a distance of 3 miles.
There are in connection with this most beautiful case of Empyema, several interesting points to be noted.

The age of the patient was very much in his favour and there could be no doubt, if the health was kept up, the patient would get quite well. It happened to be an affection of that side of the chest, the left side, on which we can give a more hopeful prognosis.

"Why did this effusion into the chest become so rapidly transformed into pus?" This is a most difficult question to answer, but I think I can find an explanation, and it has all along been a warning tome. In treating cases of pulmonary abscess, I listened the chest two or 3 days after the commencement of the disease and produced such an unhealthy effect upon the effusion which was being rapidly poured out, that lymph became immediately transformed into pus. The sudden change from the treatment by depressants such as leeches and antimony to acute blistering was wrong and injudicious treatment and could only account for the effusion becoming so suddenly converted into pus.

There was great oedema of the chest on the side affected.
affected. This symptom is a very ancient one and is found in all these cases where the effusion is excessive, and where the pent-up fluid is persistent in character. In this case there was great effusion, great oedema, and perfect immobility of the left side. There was great dyspnœa and great tendency to syncope. There was therefore nothing more that we should do than to relieve the pent-up matter by means of a free incision through the chest wall.

The successful result in the above case is mainly to be accounted for by the early removal of the fluid, accomplished before the lung had sustained any material damage from compression or had been bound down by adhesions. Let me quote from an American reprint of what was written in Lancet. 1880. Pp. 181, part ii.

An Empyema can never be cured unless the cavity of the pleura is obliterated by the expansion of the lung, the displacement of viscera, or the falling in of the chest walls or all three together. But only when the lung expands to its former size have we any right to speak of a cure having been accomplished; in the other cases recovery may have resulted, but the patient
vent is sadly crippled, having a much diminished breathing power. We cannot keep this consideration too constantly and clearly in view, it is not enough to save life in such cases, we ought also to save the lung, and it is as much a stigma on surgery to allow a patient to recover with a collapsed useless lung as to permit ankylosis of the hip to occur in a false position. A few days ago the chest walls of several of my cases of Pleurisy with effusion and those of Empyema were examined and I am glad to say that in those cases where the effusions were removed early and thoroughly, there has been a perfect cure and the little boy Boddo has a chest which, but for the mark of the incision, would baffle the most acute observer to tell which side was the one affected.

The New York Medical Record which I receive every month contains numerous papers on affections of the chest, and in connection with Empyema, I feel I am bound to notice in this article, an unfortunate mishap which is ably treated in the Record of January 3rd, 1855. The mishap to which I allude

allude to the accidental loss of the tubes in the thoracic cavity. I do not think that this accident is common, nor do I think that this could occur in the hands of a careful surgeon, but notwithstanding, Dr. Huber of New York gives a record of twenty-five cases of empyema in which this happened.

Damage tubes ought to be of the very best Chassaignac's elastic reds, and not black the latter contains a large quantity of sulphur - the tube should not be too long, just long enough to project into the chest cavity and ought to be so guarded by a iron yielding shield of vulcanite.

The above illustration will serve to give a correct idea of the safest and best method of retaining a tube in correct position. The end of the tube is split up into four pieces and drawn through the piece of vulcanite or leather, and fixed in position by stitches of fine silver wire.
Besides the operation of tapping the pleural cavity in Acute Empyema, it has been suggested to have recourse to the operation of Resection of the rib, thereby a more complete vent to the pus will be made. Only in children do I think we would be justified in removing a portion of rib, as there would be too risk of having the wall of the chest permanently weakened; but in Chronic Empyema in adults—and in children where the discharge still continues—
the practice of resecting a portion of three or four ribs is an established practice and is the best method of aiding the contraction of old empyemical cavities. I should certainly wait for a considerable number of months before I should perform the operation in an aged person; but in children I think we are quite justified in weakening the chest wall for a short time, if the abscess cavity did not get well in 6 or 8 weeks.

The object of the operation is to aid the discharge of pus and by weakening the chest wall aid the expansion of the compressed lung. Where there is a very thick layer of pus or persistent deposit I should advise scraping the cavity of the pleura as an additional procedure.
In conclusion, I must simply say that the allied diseases to Pleurisy are extremely varied and interesting and worthy of more complete study than that which it has received in these pages. My endeavour has been to present a thesis which bears testimony to the fact that although most of a country Doctor's time is spent between hedges rows, he has frequent opportunities of observing cases at the bedside which one rarely sees in towns. I should have wished to have extended this paper into the subject of Pleurodynia, but I am confident that what I have written is the result of careful study and thought, and if it is worthy of the time spent in reading these lines, I hope that something useful and instructive may hereafter be put in print which may be useful to younger members of the profession than myself.

Finis.

David Robertson Dobie
MB, CM, ED

29 April 1883
4 High Street
Coldstream, NB