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PULMONARY SUPPURATION.

Thesis submitted for the M.D. Edinburgh.

By

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PULMONARY SUPPURATION.

INTRODUCTION.

Primary Suppuration.

Abscess of the lung is a term which is often applied indiscriminately to suppurative conditions of whatever type, developing in that organ, although in many of these cases the tissue does not possess the characters of abscess in the other viscera. This is due to the anatomical peculiarities in the lung.

Abscess in the lung may be divided into two groups: (1) Primary, (2) Secondary. Primary Suppuration in the lung is of very rare occurrence and consequently although pus is found in the organ under varied circumstances, pulmonary abscess properly so-called develops only in two groups of cases, (1) in areas of previously diseased lung tissue, and (2) as the result of the lodgement of infected emboli.

Secondary abscess of the lung is caused by extension to the lung by pus from contiguous structures.

As to the causation of primary abscess the following may be mentioned.

1. Infarction and Emboli.
2. Bronchopneumonia.
3. Lobar pneumonia, deglutition and aspiration pneumonia.
4. Phthisis.
5. Pneumokoniosis.
6. Foreign bodies in the Bronchi.

7. Puncture of pleura by fractured rib or other body.

Secondary abscess may be caused by the following:

1. Empyema.
2. Cancer of Oesophagus.
3. Suppurative processes in the mediastinum.
4. Suppurative echinococcus cyst.
5. Hepatic abscess.

In the grey hepatization of pneumonia the alveoli contain material very similar in character to pus, but it has been found both macroscopically and microscopically not to be pus. This is commonly known as purulent infiltration and is not considered here under the heading of abscess in the lung.

In the present thesis, I propose to discuss the etiology of the various forms of suppuration, occurring in the lungs and to consider the chief points in the symptomatology of the different forms, giving also an account of cases which have come under my own observation at the Royal Hospital for Diseases of the Chest, London, and also at the Prince of Wales' Hospital at Tottenham.

Causes of Intra-Pulmonary Suppuration.

1. Embolism, Infarction.
2. Lobar Pneumonia. Aspiration and deglutition.
Pneumonia.
3. Broncho-pneumonia.
4. Phthisis.
5. Foreign bodies in the bronchi.
6. Pneumokoniosis.
7. Puncture of pleura by broken rib or other body.
8. Infection by contiguity, e.g.

Empyema.

Cancer of the Oesophagus.

Suppurative lesions of Mediastinum.

Suppurating echinococcus cyst.

Hepatic abscess.

1. Embolism.

A septic embolus from some external source, as from some septic inflammation of the uterus or other organ is very liable to become deposited in the lungs, and set up inflammation there and lead eventually to suppuration and abscess in the lung.

As to the origin of septic emboli, they are generally detached from clots elsewhere, e.g. in the left side of the heart, as seen in septic endocarditis, or in the femoral or some other vein. These clots often originate in the female from the uterus. In some

cases, instead of there being any actual embolus, the vessels are found full, of what, is almost a pure culture of infected organisms. The result to the lung of septic emboli, depends upon the size of the embolus, It may be large enough to cause obstruction to a large vessel, giving rise to an infarct, or, on the other hand, it may be small when no infarct can arise. In any case an acute inflammation is set up round the vessels. The vessels round about are found filled with fibrinous and haemorrhagic exudation. The lung tissue is also involved. The lymphatics are acutely inflamed and filled with small cells, these patches of inflammation become consolidated, they may be very numerous and small, or, on the other hand, they may be of large size, as the result of the fusion of many small ones. In most cases suppuration occurs in the vessels and the interstitial tissue becomes filled with pus cells, which bear down and an abscess results. Abscesses thus formed vary in size and number according to the character of the preceding consolidation. As to the termination of an abscess, it may open through a bronchus or burst through the pleura, or if the pleura is adherent, it may burst through the diaphragm into the abdominal cavity. If the patient survives and there is a free outlet for the fluid, the abscess cavity may contract and in the course of time if it be

small, it may be entirely obliterated.

The diagnostic features of the condition are often exceedingly obscure.

There is generally at first an inflammation of some of the other viscera. When emboli are dislodged from, and carried into the lung, the patient has a rigor, associated with a sudden rise in temperature, if the temperature has already been high, it rises still higher, and then drops suddenly. This is associated with some pain, dyspnoea, cachexia, and sweating. After some time, when the abscess or abscesses have formed, if they are all of sufficient size, and the patient lives long enough, signs of a cavity may be present with amphoric breathing. As the lung becomes broken down, it is often expectorated, and pieces of the lung tissue can often be detected in the sputum. If the pus finds vent through the bronchi, it may after a time, be entirely expectorated. When this is accomplished, the cavity gets smaller, and the symptoms subside to perhaps reappear again when the cavity fills up. Very often, suppuration as the result of embolism, is exceedingly difficult to diagnose from acute pneumonia, and often abscess formation is only found at a post-mortem examination. Occasionally the symptoms and physical signs are so slight, as not to be suspected, especially is this the case when the

primary disease is associated with a temperature; but in most cases, the repeated rigors, sweats, irregular temperature, and continued absence of marked physical signs suggest a pyogenic origin and a correct diagnosis can then be made.

Infarction.

This is the name given to the condition in which part of the lung is found solid, the consolidation being due to the filling of the air vesicles with blood. These infarcts are due to plugging of one of the vessels, by an embolus. The size of the infarct depends on the calibre of the vessels which are plugged. The changes which occur in the infarct depend on whether septic organisms join entrance. If they do not, the fluid may be removed and the parts in time become functionally active again. If it be infective or septic, abscesses will follow. These abscesses are always associated with septic disease elsewhere.

The symptoms vary according to size and number. Pain is complained of, like that of pleurisy, if the infarct is large, there is a considerable amount of expectoration, blood-stained at first. The temperature is high, 103° and swinging. If the infarct is large there are signs of consolidation, and also cavity formation. If the infarct has partly broken down,

there is dulness on percussion, the voice and breath sounds are not increased. In adjacent parts there are general signs of bronchitis. Small infarcts usually present no physical signs.

Lobar Pneumonia.

No sharp line can be drawn between diffuse; suppuration the so-called purulent infiltration, the purulent stage of pneumonia, and the local suppuration that ends in abscess. In all cases alike the suppuration is excited by specific organisms by staphylococcus pyogenes aureus or albus. If this is the case it is likely that suppuration will be excited whenever the organisms of suppuration find access to the lung and especially if there be a patch of inflammation already there.

The organisms may reach the lung by the bloodvessels or by the air tubes. In the former case they are usually derived from some focus of suppuration already existing elsewhere in the body and carried into the lung by embolism. The parts around the embolus whether it be large enough to cause an actual infarct or not, become inflamed and suppuration follows. These cases present themselves as septic pneumonia, the abscesses being of small size may give no evidence of their existence during life, so that presence is

usually a matter of conjecture only. They are often multiple and their death is the result.

Another method in which abscess develops in pneumonia. The period of defervescence takes place in a regular manner, but in the course of two or three weeks the patient develops irregular fever, cough, and dyspnoea, and after being ill for some time, may begin to expectorate purulent sputum, and be seized with violent paroxysms of cough, and bring up a considerable quantity of pus.

This is illustrated in case No. 1 in which the patient had double pneumonia which did not resolve, and was followed by severe cough and expectoration.

The patient may then be relieved. Healing may occur, or the abscess may refill and similar attacks follow.

Sometimes the patient may gradually go downhill, lose weight, run a hectic temperature and succumb to the effects of sepsis.

Symptoms.

When suppuration occurs in lobar pneumonia its presence is either marked by the continuation of the fever beyond the usual duration and failure of the consolidated areas to undergo resolution or else the crisis occurs in the usual manner, but in the course of two or three weeks, begins to rise again. The temper-

ature is higher than it was before and is characterised by fluctuations assuming a distinct septic type, with morning remissions and evening rises. This is seen in case No. 1 in which the temperature varied from 101 in the evening, to normal in the morning.

Dulness is present over the affected area and bronchial breathing or indistinct breath sounds will be heard on auscultation. In case No. 1 there was dulness on the left side behind also tubular breathing. As the process advances and more tissue undergoes liquefaction and especially after the abscess begins to empty itself the signs of a cavity in the lung may become apparent. Amphoric breathing and coarse crepitations may be heard. The sputum undergoes important changes, becoming greenish or sometimes dark brown in colour. As soon as the abscess communicates with a bronchus its contents will begin to be freely discharged. Fragments of tissue are brought up with the sputum. The odour is not so foul as in gangrene of the lung.

Deglutition Pneumonia.

This is a form of pneumonia which is caused by particles of food which have passed into the air tubes during swallowing. In a healthy person if food passes down the air tubes, it excites a spasm of coughing and

the food is ejected. In conditions of disease where the general sensibility is impaired or local sensitiveness of the larynx is affected, this cough may not be excited and the body not expelled, but makes its way into the air tubes, chokes them, and thus produces inflammations.

There are two groups of conditions in which deglutition pneumonia is likely to occur. Thus if a patient be more or less unconscious, e.g. a child who has fits in the course of tuberculous meningitis, or an adult with apoplexy or some other form of coma, particles of food are very likely to pass into the larynx and the pneumococci thus excited is not an uncommon cause of death. The same thing may occur in anaesthesia, from chloroform or ether, as the result of vomiting. In another group of cases there is some neuro-muscular affection of the parts about the glottis itself, e.g. in bulbar paralysis or in local paralysis following Diphtheria.

In another group of cases the glottis may be prevented from closing either by infiltration round it, or by some destructive disease, tubercular, syphilitic, or malignant.

The symptoms will be described under the heading of aspiration pneumonia.

Aspiration Pneumonia.

Aspiration pneumonia forms another group of cases closely allied to the preceding from which it differs chiefly in the fact that the particles introduced are not so large as in the former instance, but such as are more likely to be caused by the air.

Under this head are commonly included those cases in which disseminated inflammation of the lung has followed the sucking into the small air tubes of discharge of various kinds, derived from lesions in the larynx or in some larger air tubes as in tubercular or malignant disease or from a disintegrating bronchial gland which has discharged or ulcerated into the air tubes.

In case No. 3 it was found on post-mortem that a caseous gland had ulcerated through a bronchus.

Either of these conditions may occur in adults as well as in children.

Etiology.

Foreign material is swallowed by the mouth, passes into the bronchial tube from these into the bronchioles, if small enough. After a time inflammation is set up around the bronchi, the area of lung round about becomes airless. Outside this a small area of consolidation is formed which is in time surrounded by a ring of emphysema. Microscopically there is found in the affected bronchi an exudate containing many desquamated cells and leucocytes, especially the polymor-

phonuclear variety. Very soon these areas break down as the result of necrotic changes, pus is formed. These changes were well illustrated in the post-mortem examination of case No. 5 where a tintack was found in the bronchus round about which there was an area of inflammation which had broken down.

The abscesses formed are often minute in size, and do not cause serious trouble. Should an abscess be large it may rupture into the pleura and cause a pyo-pneumothorax.

Symptoms.

The symptoms of these conditions are very insidious and depend greatly upon the number and size of the abscesses. The temperature gradually rises and respiration becomes rather difficult and cough develops. This gradually increases in severity and patient becomes dyspnoeic, the face may be cyanosed and livid. Cough is hard and expectoration slight. Fever rises up to 105° with morning remissions. Pulse is rapid. Anorexia and thirst are present, also sweating. Urine is scanty and high coloured. Pain is not violent and may be absent. The termination is usually fatal.

Bacteriology.

Staphylococcus albus, and aureus, also Friedlander's Bacillus have been found.

Broncho-pneumonia.

This is a condition which is sometimes followed by suppuration in the lung. This has been practically described under aspiration and deglutition pneumonia as in the latter conditions broncho-pneumonia generally results.

Bronchopneumonia is an affection of the lung in which the usual sequence of events is, inflammation of the smaller bronchioles in scattered areas, is succeeded by involvement of contiguous vesicles.

Primary Bronchopneumonia involves the bronchioles first. It comes on without any previous disease.

The cause is the pneumococcus.

Secondary bronchopneumonia is due to many causes, e.g. Infectious fevers. The bacteriology is still unsatisfactory, no specific organisms have been isolated, amongst those present are the pneumococci and streptococci.

Pathology.

The first effect of the inflammation of the bronchioles is active congestion followed by exudation into the vesicles, sometimes serous, sometimes haemorrhagic, the alveoli become filled with catarrhal cells and leucocytes. The patches of consolidation thus produced may be small in size or large and may involve a lobule. These lobules may run together and constitute a lobular pneumonia. The final result of this

inflammation is that in the majority of cases the inflammation clears up, but it may not resolve, and suppuration and abscess may be the result.

The symptoms and signs are the same as those described under aspiration and deglutition pneumonia.

Foreign bodies in the Bronchi.

When foreign bodies gain access to the bronchi and so reach the lung, the changes they excite depend greatly upon their nature and whether they are septic or not. Clean inert substances often lie long in the lung, without producing any lesion or at any rate anything more than mechanical result by collapse or bronchiectasis.

If, however, the substances be septic, e.g. particles of food, septic discharge from the mouth, pharynx or air tubes themselves, violent inflammation is set up, and this may become suppurated. These causes present the characters of acute septic pneumonia, such as a high temperature with morning remissions and evening rises. There is also cough, dyspnoea, and pain, and if the patient succumbed one would in all probability find an acute abscess post-mortem. This is noted in case No. 5 as the patient came complaining of cough and copious expectoration and on post-mortem examination numerous purulent areas were found. If patient

survived a chronic abscess would probably result. In ~~this~~ class of case the pain occurs shortly after the foreign body has been swallowed and is not superimposed upon another symptom complex. Possibly the signs of bronchopneumonia may have been noted before those of suppuration have occurred. This is also noted in case no. 5. The signs of bronchopneumonia were present before those of suppuration were detected. As a rule septic foreign bodies produce pus very rapidly.

Phthisis.

In phthisis the lesions may be widely scattered throughout the lung or involve only a single lobe. The former type is most common in children and young adults while the latter occurs mainly in adults.

Pathology.

In the disseminated variety the process commences in the bronchioles and from thence spreads to the alveoli. A cellular exudation consisting of epithelial cells, and in part, of more distinctly tubercular products, fills both bronchi and alveoli and undergoes rapid caseous necrosis. In the early stage they appear to the naked eye as greyish red foci. These get larger coalesce and form larger areas. The vessels become obliterated with the result that the areas are dull white in colour and later on become yellowish.

The caseous masses present a finely granular appearance. Lesions may be irregularly scattered throughout both lungs from apex to base. Softening may be in progress at various places or extensive cavities may have formed. The changes are usually to be seen more advanced in the apices than elsewhere, but may be formed in the lower lobes presenting a well defined outline. When excavation has occurred the bronchi may be dilated and open directly into the cavities. Microscopically, the alveoli are filled mainly with epithelial cells. The capillaries are obliterated early in the process. Later on in the disease all traces of cell structure have disappeared and any caseous debris is left. The effect of the widespread infiltration of tubercle accompanied by inflammatory changes in the lungs is to produce an area of consolidation of grey colour. It is first soft, and granular, later on becomes firm and is glistening on section.

The stage of grey infiltration may be followed by caseation, which usually commence in well defined foci in an area of infiltration varying in size from a pea to a walnut.

In the lobar variety, the disease may be limited to a single tube or more rarely almost the whole of one lobe may be involved. On Section the affected

area is caseous throughout, yellow or greyish in colour. The surface is smooth. In other cases softening may be seen in the apices, or even a cavity may be formed. The contents of the cavity consist of puriform debris.

Symptoms.

The onset may be sudden commencing with rigors, or may be gradual with languor, anorexia, pains in the limbs, cough, and slight pyrexia and loss of strength. Later on the general symptoms become well marked, there is high fever, rapid emaciation, hectic flush, night sweats. The sputum is first mucoid, but soon becomes blood-stained and puriform.

Tubercle Bacilli are present. The pulse is rapid and respirations are accelerated. In the lobar form the onset may have been preceded by a period of impaired health, or the previous healthy may have been good. The patient is often seized with a chill, has a rigor followed by pains in the side and high fever, simulating pneumonia and the nature of the condition may not be suspected for several days.

Physical signs.

These are usually first seen at the apices. There is loss of resonance on percussion accompanied by crepitations. Very often the first signs are a few diffuse rales over both lungs. The breath sounds may be

bronchial, seldom tubular. When cavities develop the usual signs of cavities are heard. In the lobar variety the signs are those of pneumonia. There is dullness on percussion, crepitations, and tubular breathing. The absence of a crisis, a more rapid pulse, sweating and an unusual amount of wasting will serve to distinguish the condition from pneumonia. The sputum should be examined for Tubercle Bacilli.

Pneumokoniosis.

As the result of the inhalation of dust changes occur in the lung which lead to excavation and suppuration. The lesions are however generally tuberculous but not always.

Pathology.

The first effect of the constant presence of particles of metal or stone in the inspired air is to set up irritation and produce a catarrhal inflammation of the laryngeal and bronchial mucous membrane. As the process is continued it soon becomes chronic. Thickening of the bronchial walls also fibrous changes in surrounding tissues result eventually in bronchiectasis. The dilated tubes often contain puriform material.

Excavation may be produced in the lung by the breaking down and softening of consolidated areas. These cavities have dark irregular walls. They are most often found in the upper lobes.

Symptoms.

Cough is the earliest symptom. This soon is accompanied by dyspnoea as exertion and paroxysms of difficulty in breathing. In the early stages the sputum is mucoid as in Bronchitis, it is only in the more chronic stages that it becomes purulent and pigmented.

There is a moderate amount of emaciation, later on as the lung begins to show signs of excavation, the sputum alters to the so-called "^{black}~~peach~~ spit". The shortness of breath is more pronounced, the patient also loses a good deal of flesh. If bronchiectasis is present the sputum will be foetid.

The physical signs vary. The consolidation may be ^{masked}~~wasted~~ by the condition of the other lung and also the rales of bronchitis may ^{mask}~~waste~~ the crepitations of the tubercular infiltration. If emphysema is absent you will in all probability get the usual signs of consolidation and cavity formation.

Tumours of the Mediastinum.

Tumours of the Mediastinum consist mainly of two kinds Sarcoma and Carcinoma of the two as far as my experience goes sarcomata are the commoner. They may give rise to pulmonary suppuration in two ways.

(1) The bronchi may be intensely inflamed and filled

with frothy fluid and later on this gives rise to bronchiectatic cavities, such cavities may be filled with foetid secretion, this was well seen in the case of Francis Rufus which is described fully later on, here there was advanced bronchiectasis and almost the whole lung destroyed.

Almost the whole lung may be destroyed and the abscess which results may perforate through an air space and form a collection of pus external to the chest.

(3) Cavities may be formed by the breaking down of nodules of the growth and portions of the growth remaining may form walls of the cavities and surround the obliterated bronchi and the vessels which cross that intersect. There is generally a certain amount of collapse of the lung.

Symptoms.

The onset of the disease is as a rule insidious and often mistaken for bronchitis. This occurred in Rufus's case, he was treated for bronchitis for some time. It commences with cough and expectoration with some pain in the chest and shortness of breath and some emaciation. These are the early symptoms.

Haemoptysis generally occurs and may be profuse. This was noticed in the case of Harry Maynard but it was not very profuse.

As the growth increases in size it presses on the veins giving rise to oedema of the face, neck, and upper extremities, these signs may be most marked on one side. These pressure signs were well marked in Rufus's case, he had marked oedema of the face and neck also one arm.

The pain is generally well marked. This was also noticed in Maynard's case.

Cough is present and often of a paroxysmal nature. Expectoration. This may be present and is a mucoid, mucopurulent or of a pure juice nature and often has streaks of blood in it. ^{When} ~~Then~~ there is Bronchiectasis the sputum may be foetid. When the growth is undergoing softening, pieces of the lung may be seen by the microscope.

Dyspnoea. is a most marked symptom. It is at first noticed on exertion and it may be most marked on patient lying in bed as the growth increases, orthopnoea also develops. In the case of Rufus, this was well noticed, in the early stages he had dyspnoea on exertion, it was this that made him go to the hospital for further advice. When he became an in-patient at the Royal Chest Hospital the dyspnoea was more marked on lying down and finally he had orthopnoea.

Pyrexia. fever is by no means constant. It is generally present toward the end of the disease and is of a

hectic type. All the time Rufus was in the hospital under my observation he had a hectic temperature varying from 97 to 104^o. Pyrexia is often associated with inflammatory lesions elsewhere such as pericarditis.

Emaciation. There is generally a good deal of loss of weight but not so marked as in tuberculosis, it may however progress rapidly. Both Rufus and Maynard lost weight.

Physical Signs. Inspection. As the result of the pressure on the veins one generally sees oedema and cyanosis of the face, neck, and upper extremity. These pressure signs were well exhibited in the cases of Rufus and Maynard.

Enlarged glands may also be noticed in the neck and axilla. As a rule, the expansion of the affected side is diminished or even absent. Bulging or retraction of one side may be noticed.

Palpation. The apex beat may be displaced according to the position of the growth. Downward displacement is most common. Vocal fremitus is generally absent if the growth is just below the chest wall. In the case of Rufus it was diminished. If the growth is situated over the trachea the note may be tubular in character.

Auscultation. If the bronchi are excluded the breath

sounds are absent. Shortly before Rufus died the breath sounds over the affected part of lung were absent but if the growth is sustained in the post;mediastinum and has compressed the trachea loud bronchial breathing is heard. This was seen in the early stages in Rufus's case.

If there is exudation into the bronchi, rales may be heard. When the growth has undergone extensive softening, or produced destructive changes in the lung, cavernous breathing and pectoriloquy will be audible if the bronchi are patent.

The condition of vocal resonance is variable, it may be absent or bronchophony may be heard in some cases.

Abscess of Liver.

Rupture of an abscess in the liver may by burrowing find its way into the lung and so cause suppuration therein. To find pus that has gained exit ~~of~~ ^{by} way of the lung is no easy matter especially if it is of long standing. The track of the pus is generally deep seated. It may find its way into the lung in one of three ways. (1) It may come upwards lying in contact with the pericardium between the inner aspect of the right lung and right side of the pericardium. (2) In some cases it may find its way between the lay-

ers of the ligamentum latum ^{pulmonis} ~~pulveris~~ and gain entrance to a bronchus near the root of a lung. (3) The track may present a tortuous course through the inner aspect of the lower lobe of the right lung and end in a bronchus near the root of the lung.

The usual course is for the pus to find exit by the lung for some time, it may be a few days or a few weeks, when suddenly the abscess abates or more often the expectoration ceases. The cough is no longer loose, but dry, parched and irritable, the temperature goes up two or three degrees. What has happened is that the opening of the abscess cavity has been retained. After a few days it is usual for the expectoration to reappear, the cough to become loose and the temperature to subside, showing that the temporary collection of pus in the cavity has found its way through the lung. The patient in the interval gains weight and improves, after the recurrence no more trouble may ensue and the patient completely recovers. But it may go on for weeks or months. The only way to cut short these attacks is to try and reach the pus and remove it. This is impossible while the cavity is discharging through the lungs, as the abscess cavity walls are in contact and to pass a needle into an area perhaps only a fraction of an inch in thickness is impossible. The only thing to do is to wait till the opening becomes blocked

up and the cavity is distended with pus and the time is signalled when the temperature rises and the cough stops, then one must interfere by trying to reach the cavity with a needle, and when it is found drain the cavity by syphenage. The great difficulty to be encountered is the depth of the cavity and the track from the surface of the chest.

A few words may be said in conclusion of some of the rarer causes of pulmonary suppuration namely (a) Puncture of the Pleura by broken ribs or foreign body, (b) Cancer of oesophagus, (c) Suppurating echinococcus cyst.

(a) Puncture of Pleura of a broken rib.

When the pleura is punctured by a broken rib or foreign body, the lung is injured, bleeding occurs, which may be brought up by the mouth. This under appropriate treatment generally subsides, but occasionally should septic material gain entrance into the wound a septic focus is set up in the lung and abscess formation results.

This is suspected in cases in which you have had a history of injury to the chest wall followed by all the signs of septic pneumonia.

(b) Cancer of Oesophagus.

One of the common modes of death in cancer of the oesophagus is due to pneumonia, the result of spread

ulceration
and ~~relaxation~~ of the growth through the trachea, or bronchi into the lung. The perforation of the lung often sets up gangrene.

The condition is diagnosed, when with the signs and symptoms of cancer of the oesophagus, one gets in addition, signs of septic bronchopneumonia, or the patient may have had symptoms of bronchitis for a short space of time and die suddenly and only on post-mortem examination does one find ^{that} the real cause of death was the sudden perforation of the ulcer.

(c) Suppurating Echinococcus Cyst of the lung.

Suppuration is one of the most serious modes of termination of Hydatid Cysts. It may occur spontaneously or may follow rupture. Large abscesses may be formed which contain Hydatid membranes.

If the Echinococcus cysts are small, they may exist for a time without causing serious symptoms. In their growth they compress the lung and sooner or later lead to inflammatory processes, often to gangrene and the formation of cavities which connect with the bronchi. Fragments of membrane may be expectorated. Once suppuration has started the whole clinical picture is altered and one sees signs of Pyaemia. There are rigors, sweats, and rapid loss of weight. Perforation may occur through the pleura, bronchi, or externally.

Most of the cases are diagnosed as Phthisis or ⁿGangrene, and it is only the detection of the characteristic membranes or hooklets which leads to a diagnosis.

CLINICAL CASES.

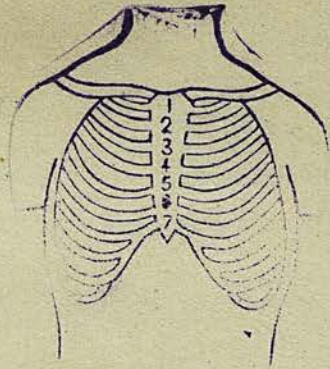
Case 1. A.H.

The case of Alfred H., aged 40 is one of a pulmonary abscess resulting from an unresolved pneumonia. The patient was admitted complaining of shortness of breath and a bad cough. There is nothing of importance in the family history.

In the previous history patient had scarlet fever when 12 years old and was in bed for nine months and had kidney disease with it. Present illness commenced four months ago with a cough. A fortnight later he had to go to bed and the doctor was called, and told him he had double pneumonia and pleurisy; he was in bed for five weeks, he had a relapse and was in bed until three days ago, since the relapse he has got no better. During this time he has had shortness of breath accompanied by a severe cough. He has brought up a lot of yellowish expectoration, amounting to about an egg-cupfull in the day. There has been no haemoptysis nor any night sweating. His bowels have been regular and he has noticed no swelling anywhere.

On examination of the respiratory system it was found in front of the chest that the movement was good and equal and that the percussion note on both sides was resonant. The breathing was a little harsh but

A. H. case I



Slight dullness



moist
rales.

marked dullness.
Subular breathing
Vocal Resonance +
moist rales
Whispering Pectoriloquy.

had not lost its vesicular character. No accompaniments were heard. Vocal fremitus and resonance present and equal.

Behind, the note at the apices is resonant but slightly less so on the left side. On the left side below the spine of the scapula the note is dull, the dullness extends downwards to the base and outward into the left axilla. Breathing here is tubular in character accompanied by moist rales. Vocal resonance is increased and there is whispering pectoriloquy.

At the right base a few rales are detected, but breathing is vesicular.

There is nothing to note in the other systems. Calmette is negative and no Tubercle Bacilli have been found in the sputum. Leucocyte count was found to be 15,250. The temperature has varied considerably swinging from 98.5 to 101⁰ and the pulse has been rather rapid.

After patient had been in hospital about a week he developed oedema of his left leg.

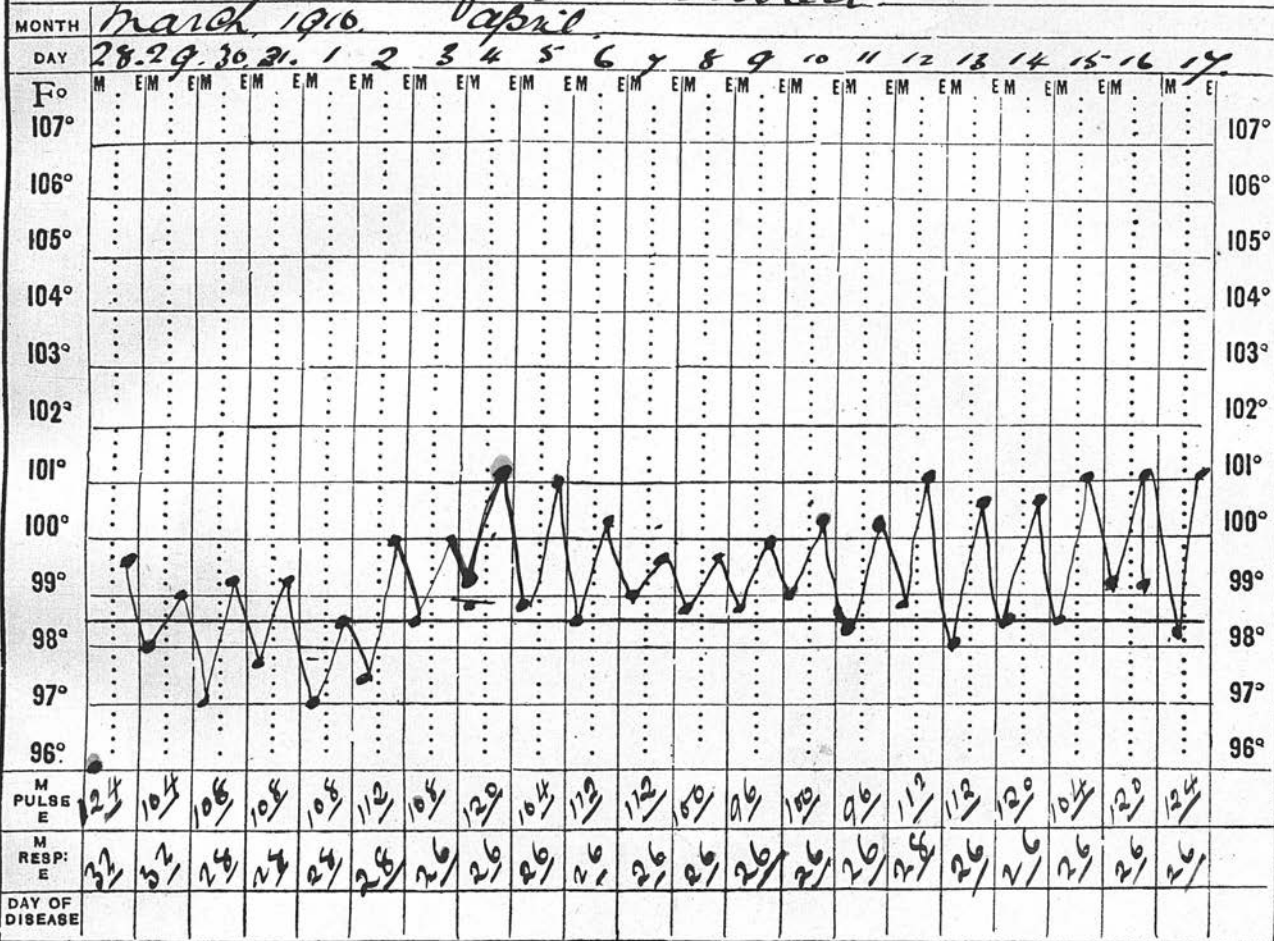
Vaccines were made and were injected on several occasions, but patient did not improve and died about five weeks after admission.

Post Mortem. There was found on opening the chest that a large cavity about the size of a small apple situated in the middle of the lower lobe of the left

Case ✓

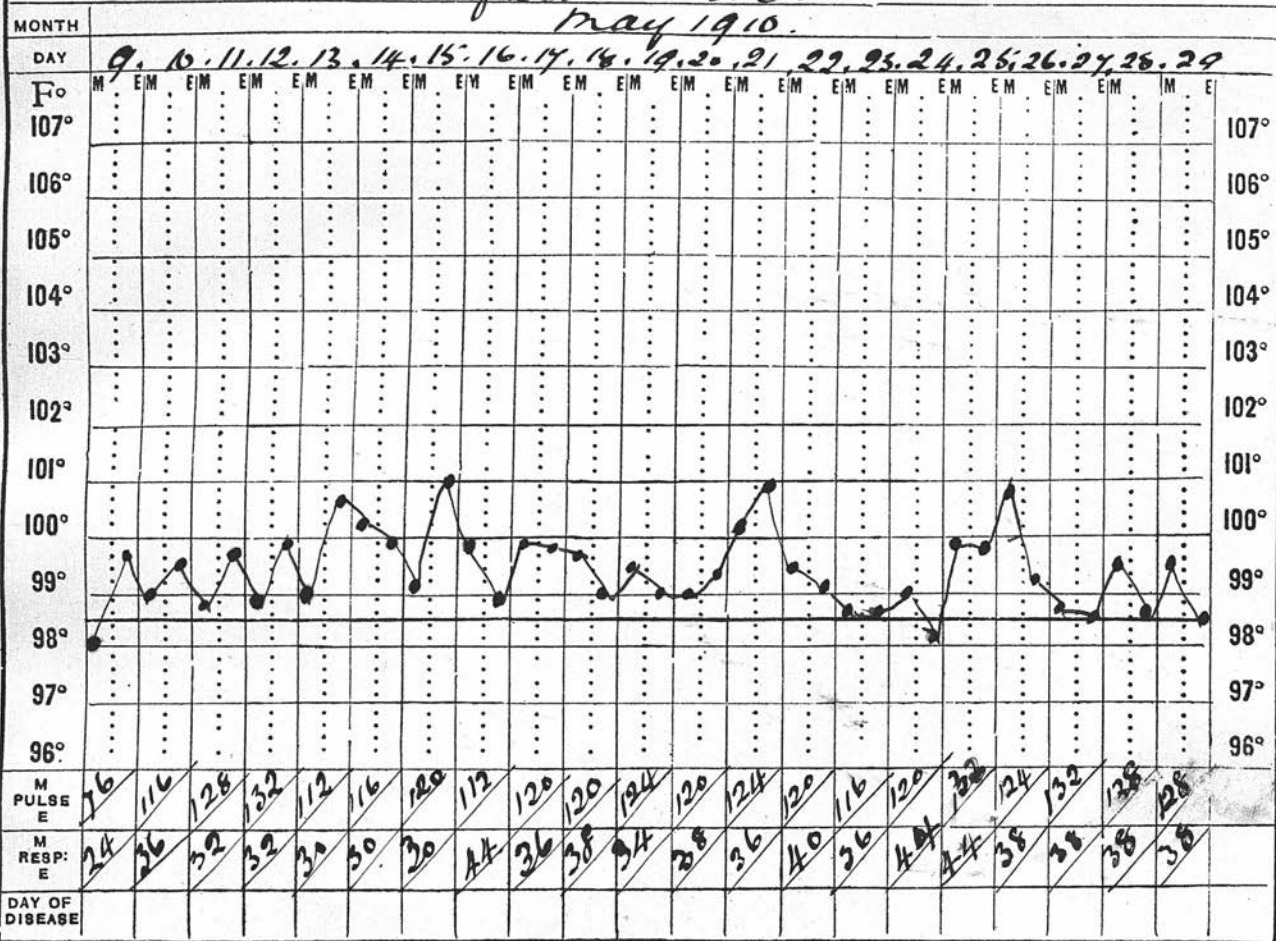
TEMPERATURE CHART.

Alfred Hilared



TEMPERATURE CHART.

Alfred Hildred.
May 1910.



lung. It contained some pus. The other lung apart from slight congestion at the base appeared quite normal.

This case ^{be} it will be seen is a very good example of pulmonary suppuration following lobar pneumonia which did not properly resolve.

Case 2. H.M.

The case of Harry M. is one of malignant disease of the Mediastinum, giving rise to pressure on the right bronchus and aspiration pneumonia.

The patient was admitted complaining of cough and expectoration of a few weeks duration.

There is nothing in the family or previous history of importance.

Twelve months before admission, patient had some trouble with a horse, he was pulled backwards but did not fall. A choking sensation came on in his throat immediately afterwards. This was relieved by a poultice. He also had swelling in each groin, the right leg being larger. Six days later doctor saw him and ordered a truss which has been worn ever since. There has been no sickness. Expectoration is yellow. Two weeks after the onset, he coughed up a few clots of blood, and has coughed up a few since. He has had sharp pain on left side of the chest on exertion. He

has always been short of breath. He has lost a good deal of weight, but his appetite is good and bowels regular.

On admission, patient lies quite comfortably in bed, slight wheezing but no stridor.

On examination I found that the chest is slightly deeper anteriorly - posteriorly and expansion is poor. An enlarged vein is seen to pass upwards to right costal margin. Enlarged veins are also seen over the front of chest and right shoulders. There is no dulness on percussion, no bronchial breathing, breath sounds are rather weak. Rhonchi are present during inspiration and expiration and moist crepitations are heard over both bases, more especially the left. In the cardiac system the apex beat could not be felt, cardiac area slightly encroached on by lung note. No abnormal dulness could be detected over the base of heart. Heart sounds are faint over praecordia but no bruits can be detected.

Both pulses are equal and regular, tension is slightly increased.

The left pupil is smaller than right. No tracheal tugging can be made out. There is nothing to note in the other systems. Two months later, we noticed that the percussion note in the second right space near sternum was dull. There were numerous crepitations over the left base. His cough was spas-

modic, but not brassy. He also complained of pain over his right hip. Three weeks later he had several severe attacks of dyspnoea, and his pulse was scarcely perceptible. He died in a few days. At the post-mortem examination we found a malignant tumour in the mediastinum involving the right bronchus, superior vena cava, and ascending aorta. Secondary growths were also seen in the omentum perirenal fat and below the renal capsule, there were also signs of aspiration pneumonia.

Case 3. W.S.

This is the case of William S. who was admitted complaining of cough, expectoration, and weakness. It was diagnosed as Bronchopneumonia and on postmortem examination a caseous gland was found which had ulcerated through a bronchus. There was nothing of note in the family or personal history.

The present illness commenced three weeks ago, with a cough which got slightly better and then got worse again until admitted. The appetite was poor, and patient was getting very weak. Before admission he commenced to spit up thick yellow sputum.

On admission patient looked ill and was of a bad colour, he is very breathless and is troubled with cough, and brings up a lot of expectoration.

On examination of the chest it is barrel-shaped

and moves feebly on respiration. Breath sounds are weak and expiration is prolonged. Rales are heard at both bases behind.

Apex beat is not visible and can only be felt with difficulty. Heart sounds closed. Other systems healthy.

Urine shows specific gravity 1016, is acid, and there is a trace of albumen. The temperature has been of a hectic type all through, varying from 97-103. The pulse has also been rather rapid.

During the whole time patient has been in hospital he has gradually gone down-hill, has lost weight and on two occasions has had haematemesis but the physical signs were never very definite. Patient died suddenly about five weeks after admission.

On post mortem examination a calcareous gland was found ulcerating into the left bronchus at its division into upper and lower lobes. There was also a small patch of bronchopneumonia at the right base.

Case 4. A.O.

This next case is one of Arthur O., aged 26 years who was admitted complaining of cough and copious expectoration for 18 years. He was diagnosed as septic bronchopneumonia. There is nothing to note in the family or personal history.

The present trouble began about eighteen years ago

with pneumonia on the left side. Patient after recovering had fairly good health till eight years ago when cough and expectoration commenced; occasionally it was streaked with blood. Patient has been losing flesh for last six years. There have been no night sweats, appetite is poor, and bowels are open.

There is nothing of importance in the family history. As regards previous illnesses, the patient had pneumonia eighteen years ago.

On admission patient was poorly nourished. He has an irritable hacking cough with profuse foul expectoration, which is worse in the morning. He has dyspnoea, and cyanosis. His temperature was 99 and pulse 96. Respirations were 24 per min. On examination of the chest in the left lung in front the breath sounds were harsh, vesicular with numerous crepitations, Behind on the left side there is dulness and bronchial breathing as shown in the diagram.

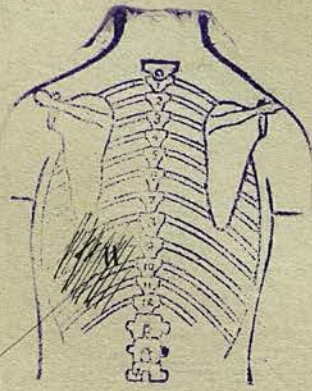
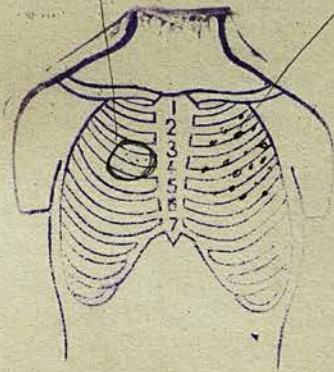
On the right lung in front there are signs of cavity formation. See diagram. Calmette was found negative and no tubercle bacilli were detected in the sputum. After the patient had been in a month, on examination it was found that the physical signs had advanced somewhat. On the right lung in front there is marked *verruca* formation, with cavernous breathing and numerous crepitations over the chest. See diagram.

A.O. case 4

~~A. 8~~

Yernica.

*Harsh breathing
crepitations*

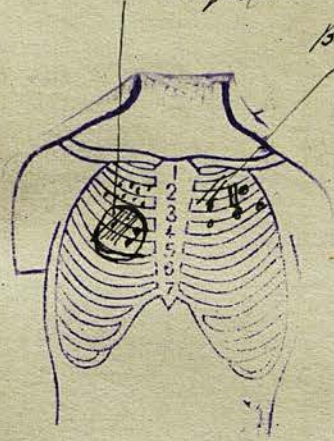


*Aullness and bronchial
breathing.*

After one month.

*Cavernous breathing.
Peculiar
crepitations*

*Bronchial
breathing
coarse rales*



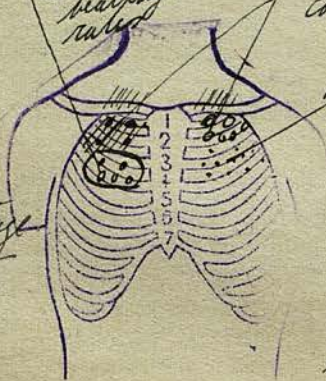
*Aullness
Bronchial
breathing*

*Yernica &
cavernous
breathing
rales*

*Bronchial breathing
coarse rales*

*Whistling
rattle.*

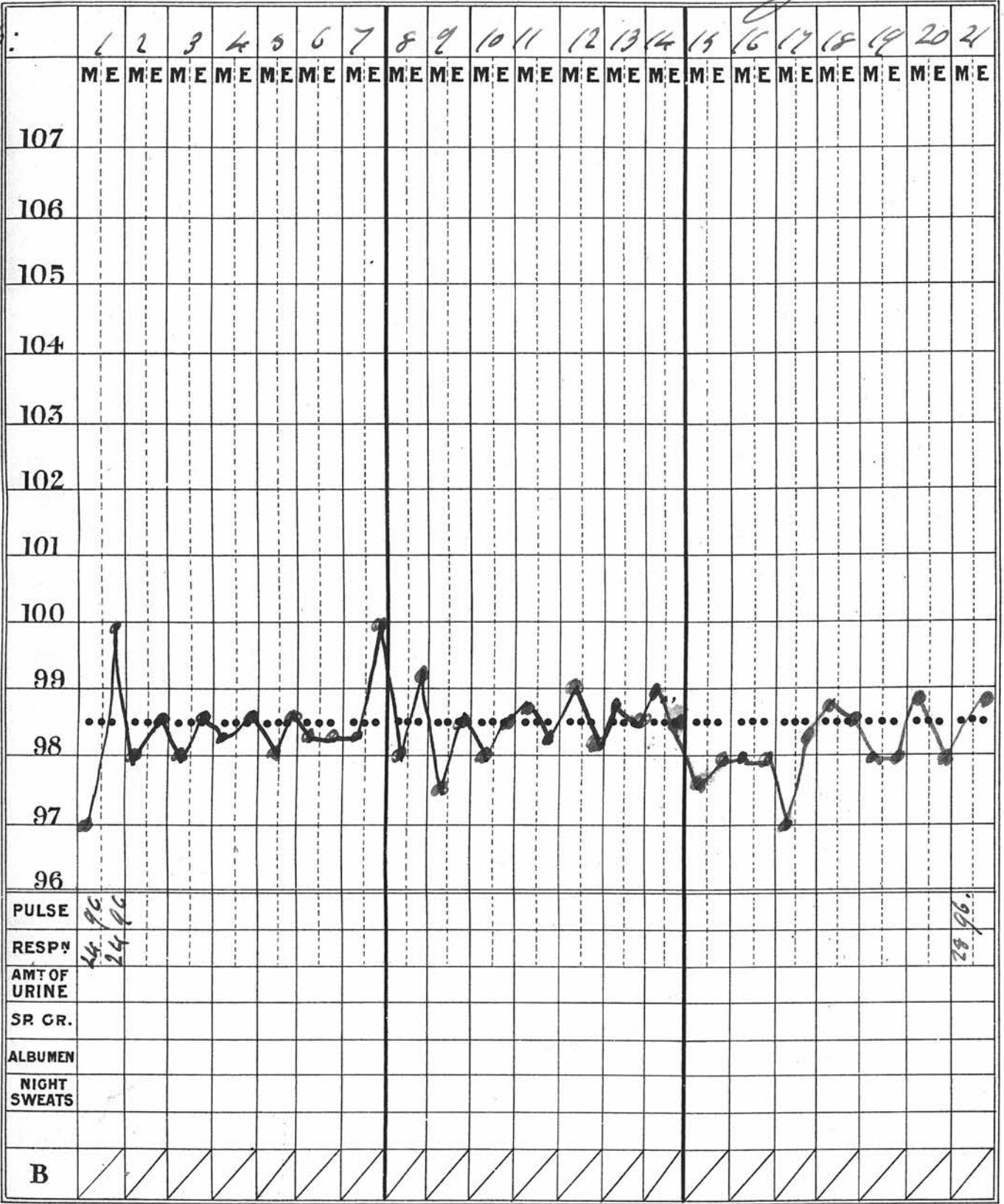
Later stage



*Bronchial
breathing
coarse
rales*

*Aullness
high pitched
rales*

No. Case 4 Name Arthur Oatway



On the left lung in front there is bronchial breathing with coarse rales. Behind the signs are much the same as before.

An Xray photo was taken, but did not show any cavities.

The patient remained in hospital for another month before he died and up to the time of his death, the physical signs did not alter much. This case was rather an interesting one, in that it apparently dated back to an old pneumonia, which had apparently not properly cleared up, as since then his cough and expectoration have dated.

The physical signs point to patches of consolidation and cavity formation in both lungs.

Case 5. Foreign Body in Air Passage B.M.J. 1909 (1)
1180.

The patient was a girl aged 4 years.

History. Her mother stated patient had a troublesome cough, especially in early morning accompanied by copious foul expectoration. This had been going on for two years, but for last fourteen days patient had been getting worse. As bronchiectasis was diagnosed, the child was admitted and put to bed. There was no history of haemoptysis, the child was taking her food well and was not losing flesh. No night s

sweating had been noticed. There was nothing definite in the family history. Both father and mother were well and the other children were the brothers who were in good health. The patient was said to have suffered from pneumonia two years previously and from a second attack eight months before admission. There was also a past history of measles but no history of ever swallowing a foreign body.

C.O.A. The child was well nourished, peevish, and restless; there was some cyanosis of both cheeks though she was not obviously short of breath. The temperature on admission was 99.8 F. the pulse varied from 124-130. The tongue was coated with white fur and the bowels were regular. The fingers were slightly clubbed. The heart was normal except that the pulmonary sound was slightly accentuated. The lungs in front showed nothing abnormal. Over left lower lobe behind however, there was somewhat diminished movement, the vocal vibrations were increased in intensity and there was marked dulness on percussion. Well marked tubular breathing was heard in several places and an increase of vocal resonance. Some fine crepitations could be heard over whole of lower lobe. The sputum which was examined on several occasions never showed the presence of tubercle bacilli, but contained pneumococci in varying numbers. The urine was acid. Spec-

ific gravity 1020 and did not contain anything abnormal.

The patient remained much about the same as regards physical signs, but the general condition improved.

After History. After remaining in hospital for a little over five weeks she appeared so well that she was about to be discharged in a day or two when the temperature began to rise and in three days had reached 103 F., the pulse was rapid at one time reaching 180. Respirations varied from 36 to 40. On examination at this time pneumonic consolidation was detected in the left upper lobe accompanied by the usual signs and symptoms of pneumonia together with cyanosis. The patient in spite of all treatment went rapidly downhill although the physical signs showed evidence of dissolution by presence of redux rales; meanwhile, however, the temperature was swinging, the pulse and respirations remaining rapid and patient ^{died} in a week.

Post Mortem. The left lung was bound down to the chest wall, to the upper surface of diaphragm, and to the left half of the pericardium by dense adhesions. As they were broken down portions of lung substance gave way and greenish foul smelling fluid escaped. The lung was heavy, weighing 15 oz., of greyish colour and there were scattered purulent areas which on section proved to be gangrenous. The bronchial tubes

were thickened and dilated and contained putrid fluid. At the apex there was a small pneumonic patch of consolidated lung.

On opening the trachea and bronchi a large tin-tack, $\frac{3}{4}$ in. in length, was found situated below the bifurcation of the trachea. The point of the tack was directed upwards and the head was obstructing the orifice of one of the lesser bronchial tubes on the left side. A small area surrounding the tack was coated with blood pigment. The right lung was healthy except for a small patch of emphysema and weighed 8 oz. The heart weighed 3 oz., was rather paler than normal, but otherwise healthy. Liver, kidney and spleen were slightly congested. The other organs appeared healthy.

Comments.

This case is one which illustrates suppuration of the lung as the result of inflammation set up through the lodging of a foreign body in the trachea. This is an extremely interesting case as it was one in which the real cause of the trouble was in no way suspected, as there was no history at all of foreign body having been swallowed and it was only at the post mortem that the real cause of the trouble was found. At first the case seemed very like a case of tuberculosis of the lung though no tubercle bacilli could be detected in the sputum.

Case 6. F.S.

This next case is another typical one of Bronchiectasis which has lasted over several years. The patient Florence S. aged 19 years complained of cough and expectoration for the last seven years.

The family history shows the presence of Tuberculosis, as two paternal aunts and one maternal aunt and uncle died of consumption.

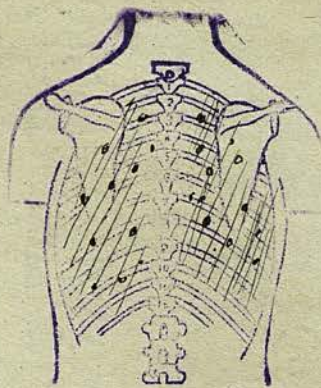
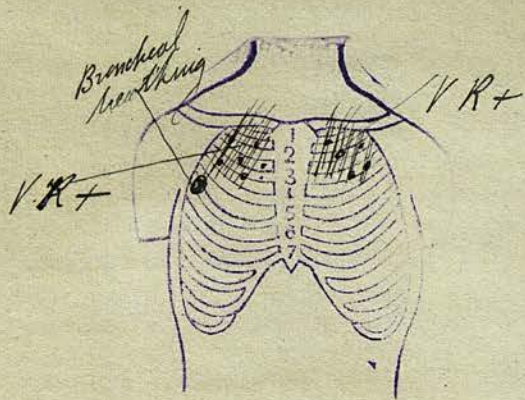
In the personal history the only illness of note the patient had, was scarlet fever seven years ago.

The present illness commenced seven years ago, when patient caught cold, and had a cough. She then developed scarlet fever shortly after. The cough continued off and on until three years ago, when she brought up some blood, about a teaspoonful at a time. This was followed by yellowish expectoration, which has continued up to the present time. It has been very foul smelling for two years. At the present time she brings up about 2 oz. at a time.

Patient has been treated in the hospital on three occasions for the same complaint. She came in first about two years ago, when she remained for about three months. She was treated with various antiseptics, drugs, and vapours, but with no apparently good results. She was then allowed out and came up as an outpatient for several months. She came in again

Florence S.
Laurie R.

Case 6.



last year, and this time was treated by direct application to the respiratory tract and as this did not seem to do her any good a surgeon was called in who resected a portion of the 7th rib, the pleural cavity was opened. No adhesions were found, and the surface of the lung seemed quite healthy. She was then discharged and has been treated as an outpatient until she was admitted a week ago with a view of passing the Bronchoscope to see if any information could be learnt.

On admission patient was rather thin and poorly nourished, but does not look distressed, although breathing is rather rapid. The fingers are clubbed and slightly cyanosed. Hands and feet are cold and clammy.

On examination of the chest there are no definite localising signs. The movement of both sides of the chest is poor. Hollowing is present below both clavicles. On percussion a poor note is elicited over whole of both lungs in front and behind. The breath sounds, with the exception of a very small area the size of a shilling in upper part of left axilla where the breathing is bronchial are harsh, vesicular with prolonged expiration and accompanied by numerous coarse rales. Vocal resonance is increased, but there is no pectoriloquy.

The patient spits up about $\frac{1}{4}$ pint of foul smelling greenish pus in the day, it is frothy on the top.

Bacteriologically it contains various organisms including pneumococci and streptococci. No Tubercle Bacilli have been found.

Apart from diarrhoea for a week, and occasional pain over the stomach, the other organs are normal. Last week we gave the patient an anaesthetic and tried for some considerable time to pass the bronchoscope, but whenever the extension tube was pushed down, the patient coughed, and the bore of the tube became blocked with pus. After several attempts we managed to see pus coming from the right bronchus, but had not time to see whether there was any coming from the left.

Patient has remained in a few days but will shortly be discharged to be treated as an outpatient.

Case 7. A.S.

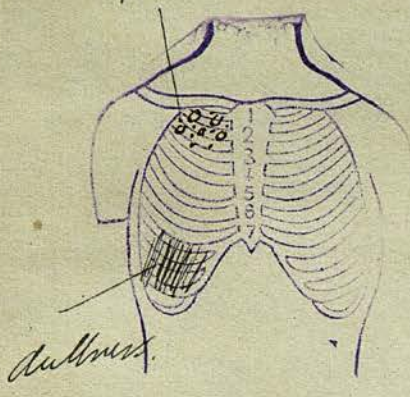
This is the case of Andrew S., aged 41 years who complained of cough and shortness of breath of several years duration. It has been diagnosed as that of Bronchiectasis.

There is nothing in the family history of note. The patient had Bronchitis when a child.

The present illness commenced three years ago with cough and shortness of breath. Since then patient has been gradually getting worse. He occasionally improved in the summer. He does not expectorate much and does not bring up blood. He sweats at night. His

Andrew S. Case 7

Rales and crepitations.

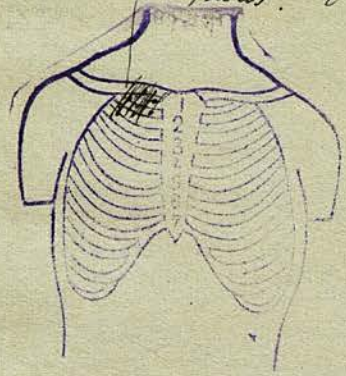


Dullness.
Bronchial breathing

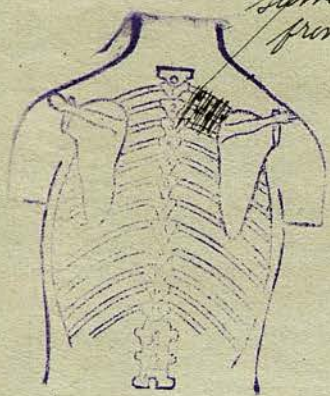
V.F. +
V.R. +



Dullness
coarse breathing
Rales.



Same as on
front.



appetite is poor. Bowels open. On admission patient looked thin, wasted and very dyspnoeic, but does not suffer much from cough. Chest looks normal. It moves badly but equally. The lung obscures a large part of the cardiac area. On examination of the lungs, the breath sounds showed harsh inspiration and prolonged expiration all over, accompanied by rales and crepitations over the upper right lobe behind there was dulness on percussion. Vocal fremitus and resonance are increased and there is bronchial breathing. At the right base there is dulness and aegophony. See diagram.

Heart is normal in size and position. There is nothing to note in the other systems. A week after admission patient was placed in a position with head lower than buttocks, and face downwards when coughing was immediately induced and almost a cup full of sputum was brought up in twenty minutes.

Patient was discharged from hospital after three months treatment very much improved, but after he had been away a month he returned again feeling much worse, looking thin, cyanosed, and dusky in colour. He was suffering from orthopnoea and the respirations were rapid and shallow. On examination of the right lung it was found there was dulness over the apex in front. Breath sounds harsh with prolonged expiration and numerous moist bubbling sounds. In the right axilla be-

low nipple the sounds are higher pitched than elsewhere.

Behind the physical signs are much the same. At the 7th right space pleural friction was heard.

The hands are cold and blue and fingers clubbed. The sputum is profuse and foul smelling.

The pulse was very small, soft and unequal and rapid. The apex beat was neither visible nor palpable. Heart sounds are almost inaudible.

A skiagram was taken which showed a large spherical cavity the size of an orange half filled with fluid and air, which occupied the post part of the chest. The rest of lung appeared normal. The right apex was slightly impaired behind. The signs and symptoms continued much the same for a few months until one morning he suddenly collapsed from heart failure.

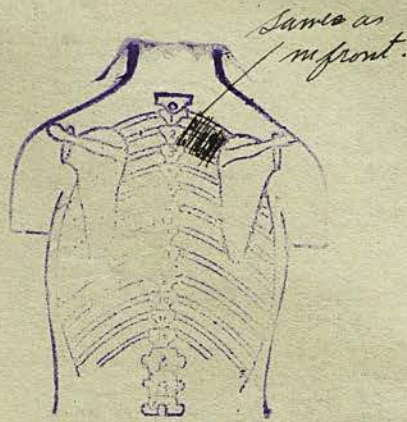
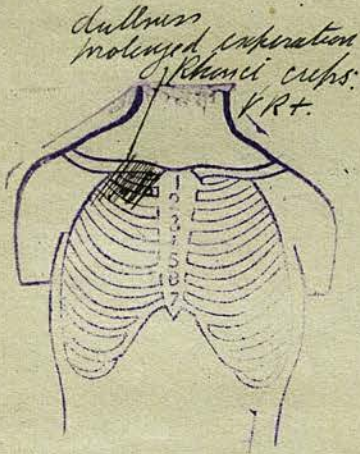
Case 8. E. R.

This is the case of Edward R., aged 12 years who was sent into hospital complaining of cough and expectoration for two months. The case was diagnosed as one of Pneumococcal Abscess.

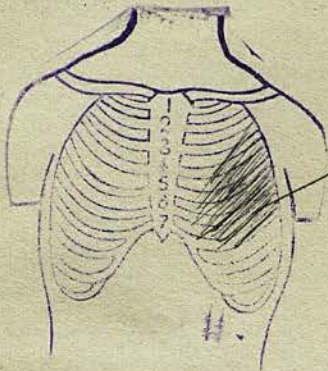
There is nothing of importance in the family history. As regards the personal history patient had pneumonia when three years old; otherwise there is nothing of importance.

The present illness commenced four months before

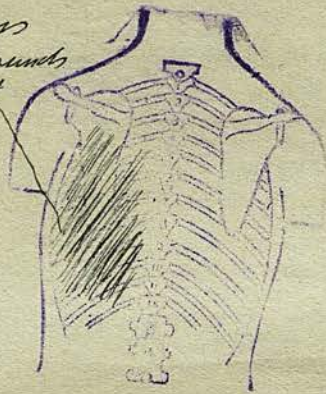
Edward R. case 8
 on admission



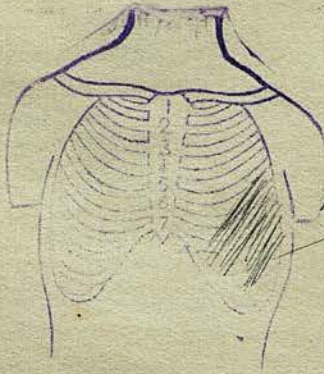
one week after admission



dullness
 Breath sounds
 absent
 V.L. -



2 weeks after admission



Breath sounds
 faint
 V.L. diminished



admission with a cough which continued much the same for a couple of months, when he began to cough up some thick yellow phlegm which had a nasty taste. Three days before admission he developed a fresh chill and was confined to bed and as he was apparently getting worse he was admitted.

On examination patient was found to be rather pale with moist skin. Tongue clear and teeth good. Pulse 108 regular of low tension. Sputum was abundant, purulent, and frothy. On physical examination of the chest one found in the ^{Right} ~~left~~ lung in front, there is dulness on percussion, prolonged expiration with rhonchi and occasional crepitations. Vocal resonance is heard unusually distinct.

Behind, the physical signs ^{correspond} to those in front.

In the left lung behind the breath sounds are weaker than in front, otherwise the left lung is normal.

The other systems are normal. The urine was alkaline but there was no sugar or albumen. After patient has been in about a week he complained of pain in the left side of chest. On examination it was found that there was no movement of that side on inspiration. There was dulness on percussion, in the axilla extending as far as the nipple in front to the spine of the scapula behind. There was absence of vocal fremitus and breath sounds. An exploring need-

le was passed into 8th space in the left post axillary line, but no fluid was found.

About a week later the physical signs on the right side cleared up and on the left side the breath sounds are now heard and the vocal resonance is increased, the sputum was still purulent in character and abundant. A surgeon was called in with a view of opening up the chest, three punctures were made but no fluid was found and proceedings terminated as patient collapsed on the table.

On examination of the sputum an almost pure culture of pneumococci were pneumococci were found so a vaccine was made and 10 millions was injected. Calmette's reaction was negative.

A week later the temperature which had been fluctuating between 98° and 102° came down to normal and remained so for several days (see chart). On examination the breath sounds are still faint on the left side and the vocal fremitus is diminished. The apex beat is not displaced.

An Xray photograph was taken which showed a shadow in the left lung at the root extending outward for some distance. In this region are two clear areas probably due to cavities.

A leucocyte count was taken and the result as follows.

Leucocytes. 24,400 per c.mm.

Polymorphs. 50%.
Lymphocytes. 49.5%.
Mast cells. .5%.

No Tubercle Bacilli have ever been found in the sputum.

Up to the time of taking these notes the patient is much about the same. His temperature varies between 98.5 and 99 and pulse about 132. There are still numerous pneumococci in the sputum.

Remarks. Here we are dealing with a case which up to the time of writing has given the staff and myself considerable difficulty in diagnosis of the exact nature of the disease. The physical signs and symptoms which are present, point probably to some deep-seated pneumococcal suppuration going on in the lung. The symptoms at first pointed to an empyema, but on several occasions a needle was explored and no fluid was found.

Case 9.

The next case is one of a girl aged 16 years in which pyopneumothorax and sloughing of the lung was found.

The patient was admitted complaining of an indefinite history. About two months ago she had a cough with some expectoration but no haemoptysis.

The family history is tuberculous. The grand-

mother, mother, and brother died of consumption and one sister is at present ill with the same disease. Patient has had Scarlet fever when a child, but no previous chest trouble. On admission patient was found to be fairly well nourished, but had a pallid complexion. Pulse 104. F. 103.4. Respirations 40 per min.

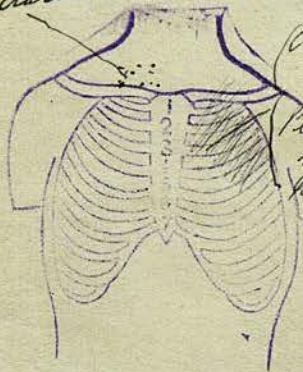
The left lung anteriorly, showed deficient expansion and vocal fremitus was absent. The percussion note was hyperresonant and faint amphoric breathing could be heard. Behind, vocal fremitus is also absent. Percussion is hyperresonant, except at the base where resonance was deficient, and breath sounds are absent. Above this breath sounds were ~~inaudible~~, ^{and} ~~but~~ vocal resonance was amphoric in character. Hippocratic succussion splash was well heard at left base. During later period of patient's illness metallic splashing could be heard over front of left side, also the bell sound.

In the right lung in front, a few crepitations could be heard above the clavicle. Otherwise nothing abnormal could be detected. Cardiac pulsation could be seen to right of sternum, but no indication of valvular disease could be made out. Urine acid, specific gravity, 1023, no blood, albumen, or sugar.

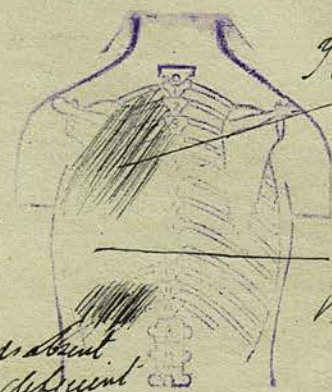
After admission, an exploring needle was introduced at the left base behind and clear fluid was withdrawn. The needle was introduced again and a few days later

Case 9.

crepitations.



Expansion -
V.F. absent
Percussion note
hyperresonant
Breathing amphoric

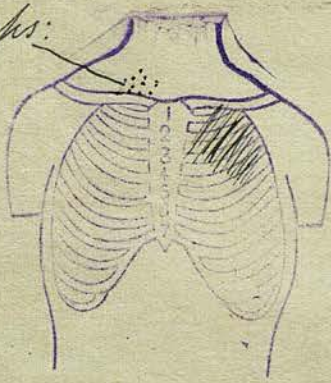


V.F. absent
note hyperresonant
Breath sounds heard
V.R. amphoric

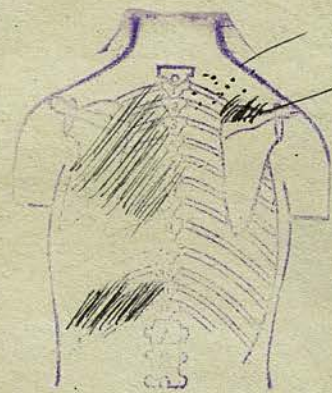
Breath sounds absent
percussion note deficient
Hippocratic succussion

one Week later.

creps:



crepitations.
friction



some air was allowed to escape.

A week later some pleural friction was heard in the right supraspinous fossa and crepitations were heard above and below clavicle. The sputum varied in amount from four to six ounces, daily, and was mucopurulent in character. No tubercle bacilli could be found.

A month later patient had a severe paroxysm of coughing with dyspnoea and coughed up a quantity of purulent material. Died shortly after. The temperature chart showed an irregular fever with marked remissions. On post mortem examination when the pleural sac was opened a considerable gush of air occurred. Three pints of yellowish watery fluid were found in the left pleural cavity and lying free in this tissue were four pieces of lung tissue. The rest of lung was shrivelled up. On Section the bronchioles contained pus. Right lung showed numerous yellow caseous nodules in the upper and middle lobes. A cavity the size of a cherry was seen in the upper lobe.

Case 10. J.H.

This is another case of malignant disease of the lung with abscess formation. It occurred in John H- who was admitted complaining of cough and shortness of breath of six weeks duration.

There is nothing in the family history. Patient has had smallpox fourteen years ago.

The present trouble began six weeks ago with cough and shortness of breath. A month before admission and on two occasions since, patient has brought up a teacupfull of blood. Patient also complained of pain over left side of chest on exertion. There has been sickness, but the appetite is poor. He has had night sweating and has lost two stone in weight during the last six weeks. On admission patient has slight dyspnoea and his cough is troublesome and he complains of pain over left base and axilla.

On examination of the left lung it was found that that lung did not move so well as right on inspiration. The percussion note is impaired over whole lung. There is also a feeling of resistance at the base. Bronchial breathing is heard above the left clavicle and vocal resonance is nasal in character. At the base, breath sounds and vocal resonance are almost cut off. No adventitious sounds are heard.

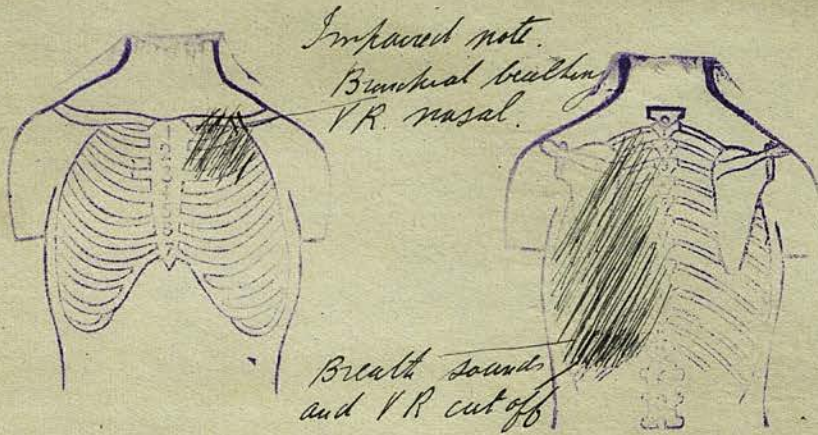
The apex beat is difficult to locate. A systolic murmur is heard in the mitral area.

Other systems are healthy.

Calmette reaction was found to be negative and no tubercle bacilli were detected in the sputum.

The patient remained in hospital for about a month

J. H. Case 10



without any apparent alteration of physical signs. He died suddenly while he was eating his dinner.

On post mortem examination a new growth was found involving the left bronchus and completely blocking it. There was considerable blood stained mucous in the right bronchus. The tumour involved the left lung which is collapsed and numerous abscesses are seen in its substance.

Case 11. G.S.

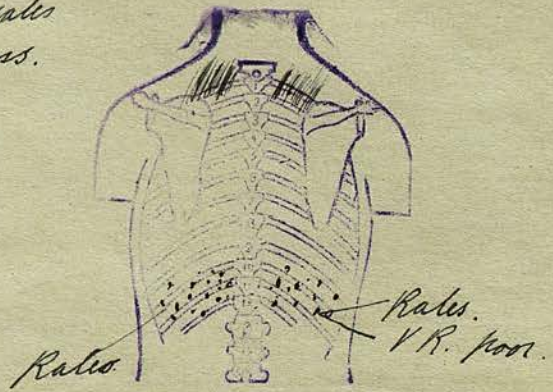
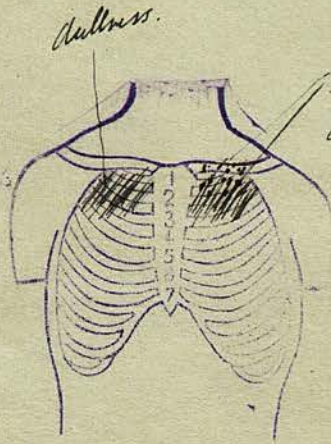
The next case is another one of sarcoma of the lung showing suppuration.

The patient is one George S., aged 18 years who complains of pain on right side of chest of three weeks duration.

There is nothing in the family history or personal history.

The present illness began three weeks ago with cough which was hard and brassy and worse when the patient was at rest. This was followed by pain in the axilla which was sharp and worse on coughing on taking a deep breath. Patient has night sweats but does not think he is losing flesh nor has he had any haemoptysis. On admission patient seems well nourished. Both **checks** appear puffy especially under the eyes. There is no clubbing of fingers. Patient has a hard

George S. Case 11



[Faint handwritten signature]

irritable cough.

On examining the lungs one finds that the movement of the right lung is deficient. There are large veins in the neck which fill from above. Oedema is well marked. Enlarged glands can be felt in each axilla.

Vocal fremitus is not pronounced anywhere. There is dulness below both clavicles in front and also at both apices behind.

On auscultation breath sounds are feeble over both lungs especially the right,, accompanied by rales at the bases. A few moist rales are also heard below left clavicle. Vocal resonance is louder over right side than left but poor at right base.

The sputum is frothy with very little solid material in it.

The other symptoms are normal.

An Xray photo shows a diffuse swelling over right lung.

Soon after admission patient began to lose weight and the oedema gradually became more marked in the face. The temperature chart kept swinging, after he had been in hospital he rapidly got worse and died.

Case 12. A.D.

This case is one of sarcoma of the lung in which one or two small abscess cavities were found in the lung.

lung.

The patient is Arthur D., aged 41 years, who has been in hospital before, for the same trouble. When first admitted he was complaining of cough and expectoration of six months duration. There was nothing of importance in the family or personal history.

When admitted patient appeared weak and wasted, but only lost two pounds during the six weeks he remained.

On examination of the chest, the signs were not definite.

The sputum contained blood and bloodclots. The temperature and pulse were rarely febrile. Respirations were 20 per minute. Pupils were equal.

When patient returned a month later, the physical signs were more definite. There is absolute dulness on percussion over the right lung in front from apex to the nipple and also over a corresponding area behind. Vocal fremitus is increased and bronchophony with bronchial breathing is heard below.

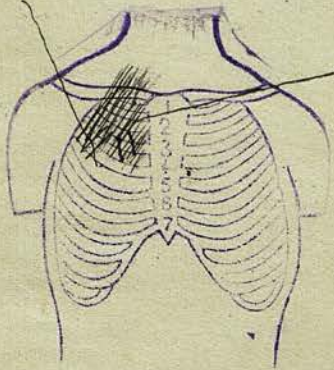
The cardiac area is not affected, but the heart sounds are very audibly heard in the axilla.

Knee jerks are absent in both knees and there is a patch of anaesthesia on inner side of the left calf.

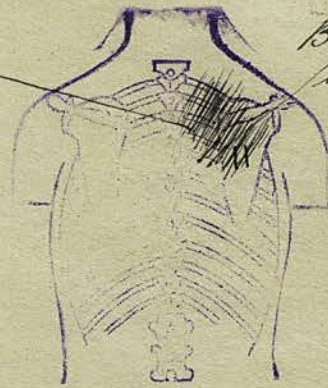
Eyes react to right and accommodation, but the right pupil is larger than the left.

Arthur. D. case 12.

Bronchial breathing

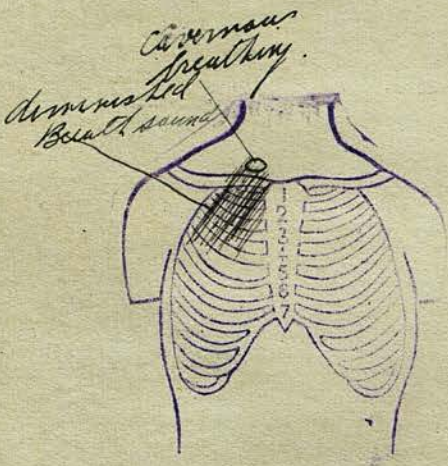


Dullness
V3+
Bronchophony

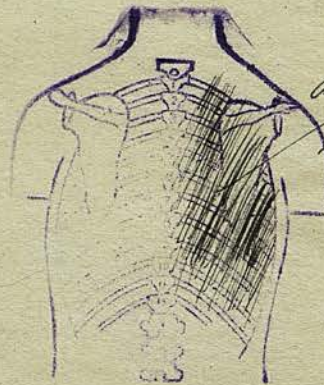


Bronchial
breathing.

Later stage



Cavernous
breathing.
Diminished
breath sounds



Diminished
breath sounds.

Since patient's admission he has steadily got worse, he has not taken his food and has vomited several times daily. Headache is constant and the optic discs show optic neuritis.

The breath sounds have now been diminished over entire right lung except at the apex where it is cavernous. There are no rales heard over this part. There has been no temperature and pulse is 80 per minute. The Xray showed a large dense rounded mass above the base of the right lung continuous with a mass in the posterior mediastinum. Lungs elsewhere appear normal.

The patient died suddenly.

On post mortem examination a new growth, sarcomatous in nature was found involving nearly the whole of the right lung and one or two abscess cavities were seen.

This case is rather interesting in that the patient ran no temperature nor did the pulse accelerate and yet on the post mortem examination abscess cavities were found in the lung.

Case 13. H.B.

This next case is one of sarcoma of the lung causing destruction of lung tissue and abscess formation.

The patient was Henry B., aged 59 years, a labourer by trade. He was admitted complaining of cough, weakness, loss of appetite, and sleeplessness, of six

months duration.

The family history showed that the wife and daughter died of chest trouble. In the personal history there is nothing to note. The present illness commenced with a cold which patient thought was bronchitis, which kept him in bed for seven weeks, during which time he coughed, and spat up a good deal of phlegm. He did not lose any weight. He has never been short of breath, nor had haemoptysis. As patient did not improve much, he came to the hospital for further advice.

On admission patient was noticed to be pale, anaemic, and alcoholic in appearance. He breathes rapidly and has a cough and spits a little.

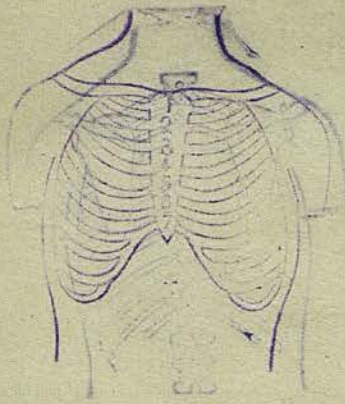
On examining the right lung behind there is impairment of movement in the lower lobe. Vocal fremitus is diminished. There is dulness on percussion and absence of breath sounds. There are crepitations moist in character. Vocal resonance is good.

In front and over the whole of the left lung the physical signs are normal.

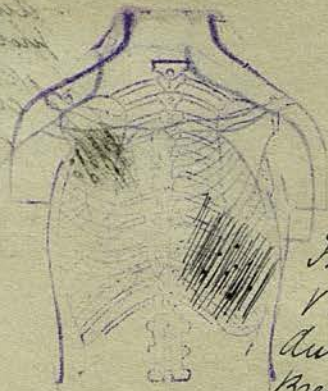
The other organs are healthy. The temperature is swinging, ranging from 97° to 100° . We noticed that there were signs of impairment of the left lung after patient had been in two weeks, below the clavicle there was some dulness with a few fine pitched crepit-

Henry B. Case 13.

1883

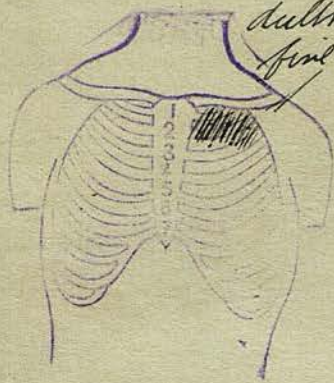


*Impaired movement
V L -
Dullness
Breath sounds absent
crepitations.*

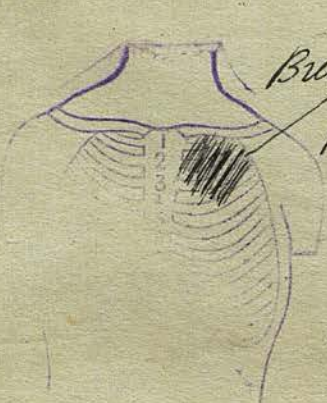


*Impaired movement
V L -
Dullness
Breath sounds absent
crepitations.*

Two weeks later



*Dullness
fine crepitations*

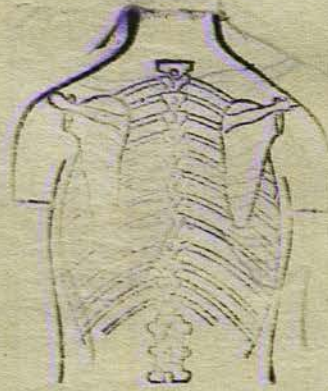
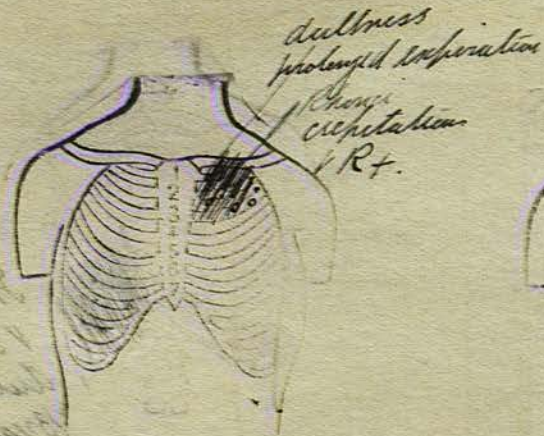


*Breath sounds feeble
V R -*

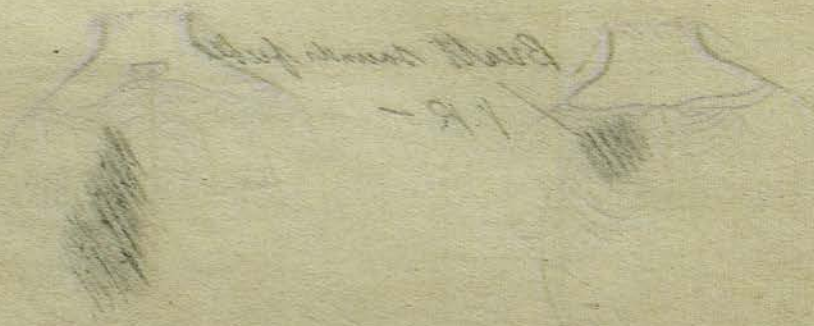
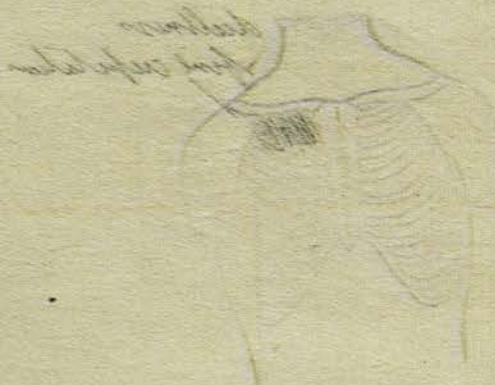


Eduard R.

Case 18



Case 19



No. 11

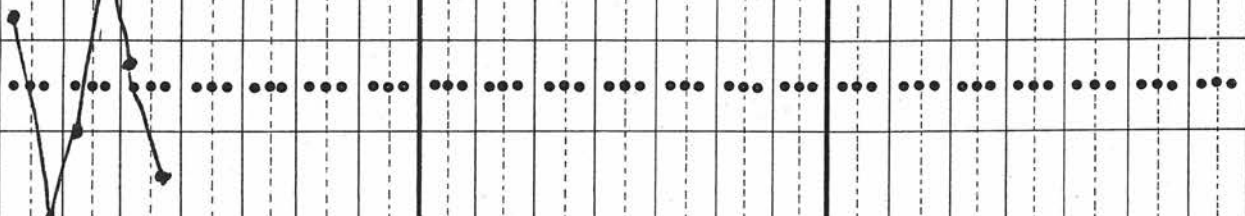
Name *Battiswilt.*

July.	6	7	8	9																	
	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	
107																					
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105																					
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PULSE	80	112	108	86	100																
RESPN	27	28	28	24	28																
AMT OF URINE																					
SP. GR.																					
ALBUMEN																					
NIGHT SWEATS																					
B																					

pts to compare 72

Repts. 8 1

and 1 cur.



No 11

Name Batterault

June	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	
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PULSE	100	80	100	100	111	100	117	108	100	110	80	68	60	64	68	71	100	71	108	104	96	94
RESPN	24	28	28	30	29	28	32	32	30	31	34	35	36	36	36	37	38	37	38	38	38	38
AMT OF URINE																						
SR GR.																						
ALBUMEN																						
NIGHT SWEATS																						
B																						

put on bath 1
 7:30 present pulse
 grad. by pulse to put on bath for next
 out: cut down regimen
 1 1/2 pulse unit of heat bath
 put bath 3/4
 put bath for section 6 pulse.
 put bath 8:30
 bath 3 1/2 3 am
 cut down reg 6

No.

Name Bullwatt

May	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
107																						
106																						
105																						
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PULSE	120	100	90	85	100	100	108	100	104	110	112	108	105	105	88	88	104	105	104	104	100	100
RESPN	30	28	26	24	25	25	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
AMT OF URINE																						
SP. GR.																						
ALBUMEN																						
NIGHT SWEATS																						
B																						

inconsistent

ations. The following weeks there were signs of further extension to the lower lobe here the breath sounds are feebly heard and vocal resonance is diminished.

The patient is rapidly getting worse, he is becoming emaciated, and is in a drowsy irritable condition. The pulse is irregular, and patient is having incontinence of urine and faeces.

The dulness on right side of chest has risen to level of the root of the scapula. His mental condition is very confused. He has had several rigors. After being in this condition for about a week he died suddenly.

On post mortem we found a large sarcomatous growth at the base of the right lung which was found to occlude the main right bronchus. The lesser bronchi were dilated and sacculated. Below the tumour the lung was extensively broken down and an abscess was found containing thick yellow pus. The left lung was congested and oedematous. There was no pleural effusion.

Case 14. F.R.

This case is one of Francis R., aged 31 years, a packer by occupation who came to see me in the out-patient department on account of cough and shortness of breath of 5 months duration. The case is diagnosed

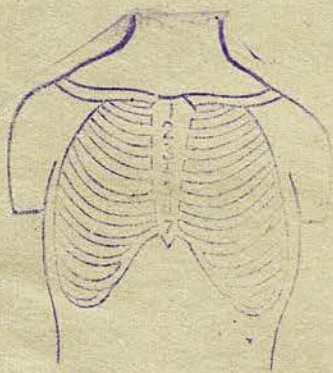
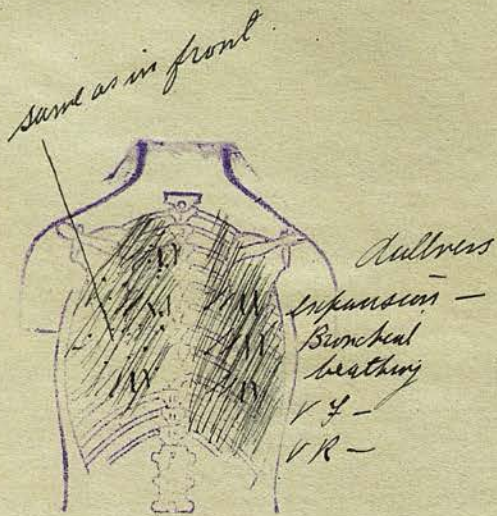
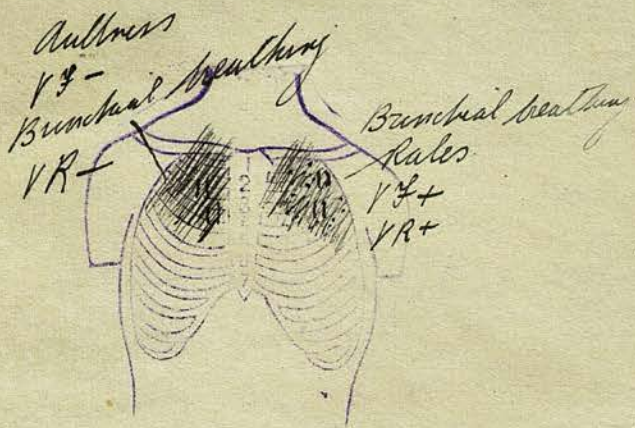
and confirmed post mortem as one of Mediastinal New-growth. The family history showed that the father died of bronchitis. There is nothing in the personal history.

The present illness commenced about five months ago with cough and shortness of breath. He was under treatment by his family doctor for bronchitis for several weeks with no apparent improvement. He was treated as an outpatient at St. Bartholomews' Hospital for some time. At that time he first noticed he was losing weight, and his sputum was tinged with blood. He also had profuse night sweats. As he was getting rapidly worse he was advised to come to the chest hospital where he was taken in. On admission it was noticed that he had profuse perspiration and was suffering greatly from dyspnoea. He had slight cyanosis. The temperature was 101.

On examination of his chest, I noticed that there were numerous small dilated venules in front and behind on the right side. There were also dilated veins running up from the abdomen.

On the right lung in front there was dulness all over lung area. Vocal fremitus was diminished, and there was bronchial breathing. Vocal resonance was decreased. Behind there was absolute dulness over whole lung, and diminished expansion. There was

Y. R. Case 14



bronchial breathing and both vocal fremitus and resonance were diminished.

Over the left lung in front there is bronchial breathing over whole lung with rales. Vocal fremitus and resonance are both increased.

Behind the signs are much the same. The patient became rapidly worse. He developed in a few days, oedema over neck, chin, and face, especially below the eyes. It is also present in the pectoral fold in the right subclavicular region. A week after admission the oedema had spread to both arms. Dyspnoea is very pronounced. The upper part of the left side of the chest is the only part in which the breath sounds can be heard. The pulse was pretty rapid 120 per min. It was regular in time. Both pulses are equal. The blood pressure was 120 min. The left side of heart extended $\frac{1}{2}$ in. beyond nipple in the 5th space. No murmurs were detected. An Xray photo was taken, showing the right side of chest opaque from apex to base. The left lung showed a general want of clearness.

The patient died suddenly after being in hospital two weeks.

On post mortem examination, on opening the right bronchus one saw that it was completely occluded by a newgrowth arising in the glands around the bronchus. On sectioning the lung, pus was found exuding from its surface and it was found that the whole organ was one

mass of cavity formation with dilated bronchi being in an advanced condition of bronchiectasis. The tumour invaded also the root of the lung, it was about the size of an orange.

The left lung was normal save for some oedema of the base.

On microscopic examination the newgrowth was found to be a lympho-sarcoma.

Case 15. J.S.

The next case is one of Jane S., aged 57 years who was admitted complaining of pain in the chest and shortness of breath. The case was diagnosed as one of thoracic growth. The family history is tuberculous, the father, five brothers, and one sister died of consumption. The mother died of carcinoma. Patient is a married woman, has three children living, and three miscarriages. She had gonorrhoea when 18 years, and a gumma of the jaw at 50 years.

On admission patient is noticed to be very thin and of a sallow complexion. On examination of the lungs there is hyperresonance and good movement on the right side of chest. On the left side no movement can be seen before or behind. Vocal resonance is not diminished. Rales are heard over the greater part of the chest especially at the bases.

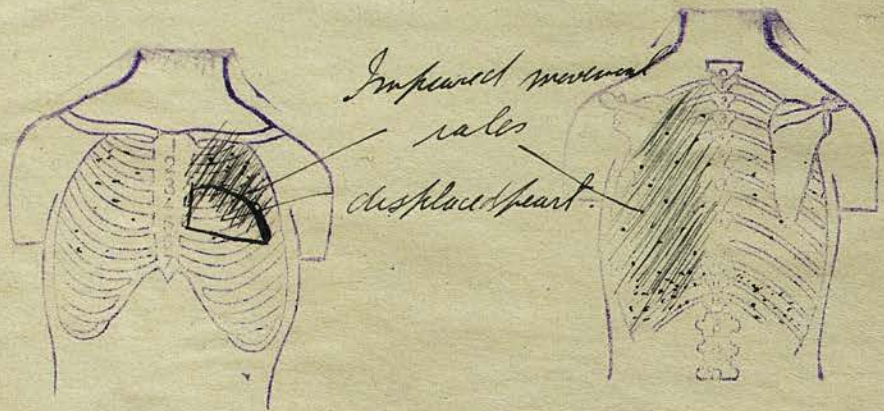
The heart is displaced to the left, the right border corresponding with the left lateral sternal line.

A fortnight later on examining the lungs it was found that in the right lung anteriorly the vocal fremitus and resonance were increased. Behind the vocal fremitus is diminished.

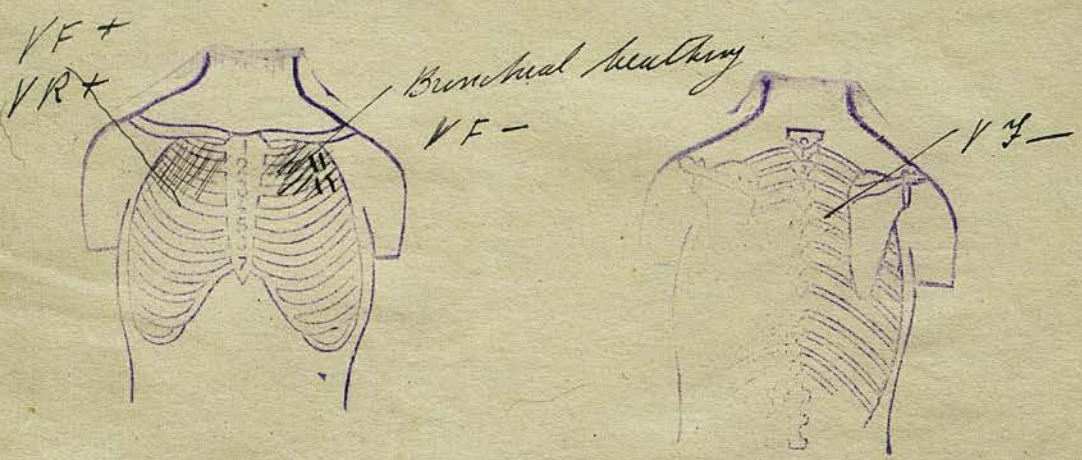
In the left lung anteriorly the breathing is bronchial and vocal fremitus is diminished. Behind the vocal fremitus is diminished. A skiagram was taken showing irregular movement at the left base, the right posterior lung is normal and the post mediastinum was clear.

The patient died but a post mortem was not allowed, but here I think the physical signs and symptoms were quite sufficient to warrant the diagnosis of Thoracic Newgrowth.

June S. Case 15



Two weeks later



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