

Haemoptysis : being a clinical lecture delivered at Guy's Hospital on January 27th, 1900 / by J.H. Bryant.

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HÆMOPTYSIS.

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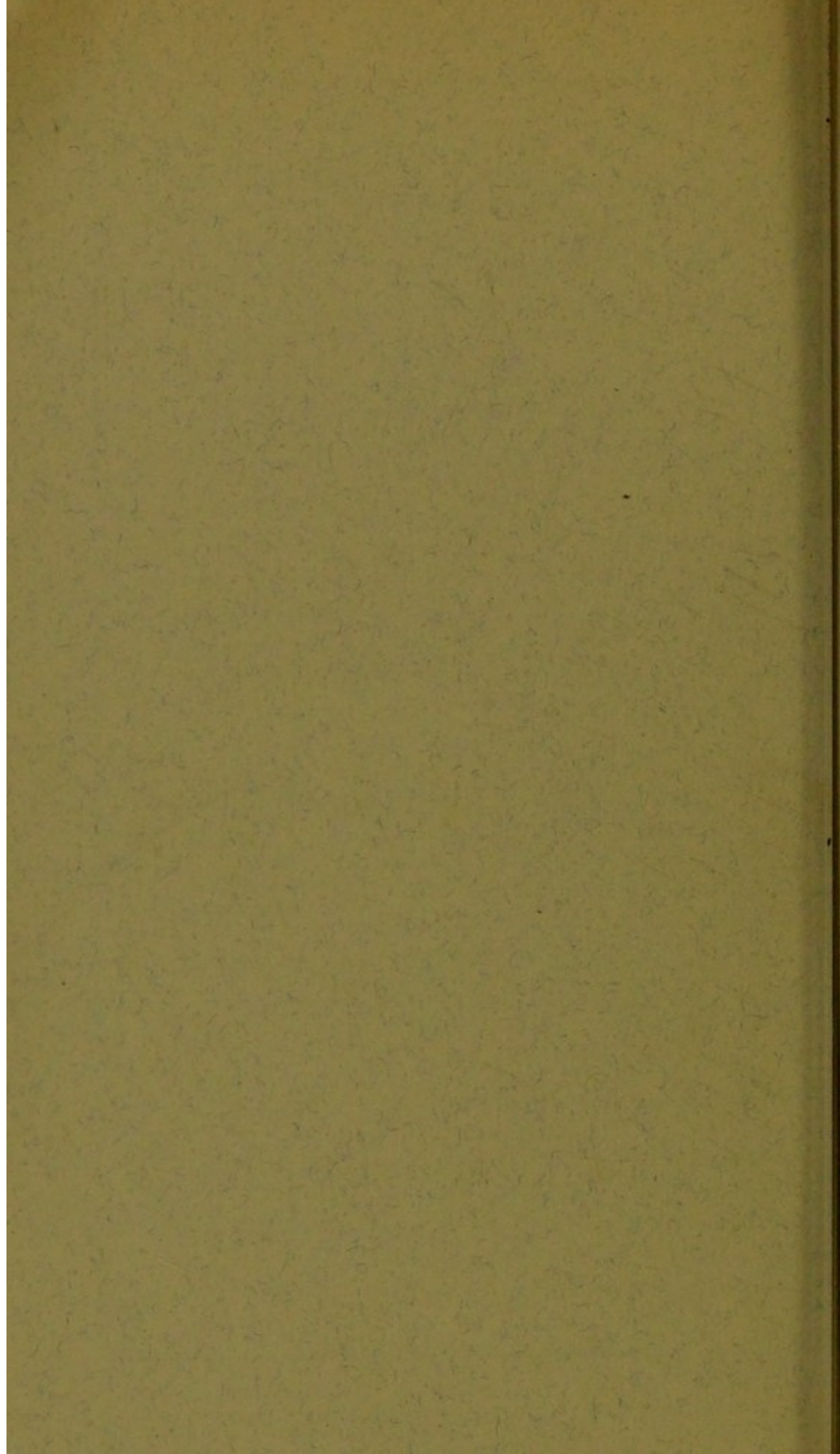
*A Clinical Lecture delivered at Guy's Hospital
on January 27th, 1900,*

By J. H. BRYANT, M.D.

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1900.



HÆMOPTYSIS.

GENTLEMEN,—I have recently had under my care in John ward, a patient suffering from Hæmoptysis. Twice before I saw him he was seen and examined, and on both occasions was diagnosed as suffering from hæmatemesis due to cirrhosis of the liver. After determining that he was suffering from hæmoptysis, and not from hæmatemesis, the differential diagnosis of the actual cause of the hæmoptysis presented a good many difficulties. These reasons I have considered sufficient excuse for taking this case as the text for a clinical lecture on hæmoptysis. I shall read to you some notes of the case which I have obtained from the excellent report of Mr. F. G. Cross. I shall then point out the differences between hæmoptysis and hæmatemesis, then discuss the differential diagnosis of the causes of hæmoptysis, giving a brief account of the pathology and morbid changes associated with each variety.

The patient is a male, aged thirty-eight, and was admitted, under my care, into John ward, on January 1st, 1900, for hæmoptysis. His father suffered from gout and died of heart disease, one of his brothers suffers from gout; there is no history of tubercle. The patient is married and has three healthy children. Sixteen

years ago he had a vesical calculus removed, and fifteen years ago he had an attack of typhoid fever. He takes about five or six pints of beer a day, and two or three "rums" before breakfast. For the last twelve months he has complained of a heavy sick feeling when he first gets up in the morning. He has never had syphilis. Five years ago he came to the front surgery suffering from epistaxis; there has been no recurrence until last Christmas, when he had another slight attack.

On January 1st he had been in bed about an hour when he felt a gurgling sensation in his throat and found his mouth full of blood; he thinks he brought up about half a pint. He did not retch, nor was there any cough or choking sensation, but it seemed to well up into his throat. He at once came to the hospital, was seen by the house-physician, who told him to go home and rest, and gave him a card for the out-patient department. He came up at 1 p.m. to my out-patients, when I saw him; he was then coughing up bright, red, frothy blood. I made a very superficial examination and came to the conclusion that it was a case of cardiac hæmoptysis. He was admitted into Clinical ward and at once put to bed.

Condition on admission—He is a big, stout man, with a florid complexion, and with small, dilated venules on his nose and cheeks. The sclerotics are very slightly jaundiced. There are no tophi visible. The fingers are not clubbed. There is no anasarca.

Alimentary system.—The tongue is not furred. The bowels are constipated. There are no hæmorrhoids. The abdomen is large and

flabby. The edge of the liver can be felt two inches below the costal margin, in the right nipple line; it is hard, and the surface, as far as could be determined, is smooth. The spleen could not be felt. The chest is very emphysematous. A few faint rhonchi are heard at the bases. There are no signs of phthisis.

The sputum.—At out-patients he coughed up a good deal of bright, red, frothy blood-stained sputum.

Circulatory system.—Pulse 82, regular, low tensions, artery not thickened. The cardiac impulse cannot be seen or felt. The area of cardiac dulness is smaller than normal on account of the emphysema. In the fifth space, about half an inch inside the left nipple-line, a distinct blowing systolic murmur can be heard; it can be traced outwards into the axilla for two inches, but better inwards for two inches towards the left border of the sternum. The second sound at the base of the heart is loud.

Urine.—Sp. gr. 1018. Very slight trace of albumen. No blood. Urea 3 per. cent.

He was allowed ice to suck, and was kept on a milk diet. The following mixture was prescribed:—

Tinct. Opii.	...	...	℥v.
Acid Sulph. Aromatici	...	...	℥x.
Syr. Balsam Tolutani	...	...	ʒi.
Aquam ad.	...	...	ʒi.
6tis. horis.			

January 3rd. He has been kept quite quiet, lying on his back, and he is much better. He still spits up blood-stained sputum, which is now more of a brownish than a red colour.

4th. Better. Sputum still brownish in colour.

5th. He was allowed to get up after tea.

8th. He went out feeling perfectly well. With the exception of emphysema nothing abnormal could be detected in the lungs. The sputum was examined for tubercle bacilli, but with a negative result.

Now, the first point of interest is, that on two occasions, *i.e.*, when seen by the house-physician in the early morning, and by the clerk in the out-patient department, he was thought to be suffering from hæmatemesis. This mistake was made on account of the alcoholic history, the alcoholic appearance of the patient, and the enlargement of his liver. A careful examination of the blood brought up, and the symptoms associated with it, would have shown that in spite of the evidence of alcoholism and cirrhosis of the liver, the blood had come from the lungs, and not from the stomach.

When you are called to see a patient who has been bringing up blood, your first consideration must be to determine whether it is a case of hæmoptysis or hæmatemesis. These two conditions can only be distinguished by carefully enquiring into the history of the symptoms, by an examination of the blood which has been brought up, and a careful physical examination. When I saw this patient in the out-patient department he clearly stated he had coughed up the blood, that he had not been sick and had not even felt sick. He described the blood as being bright red in colour, frothy, liquid, and not in clots, and on examination it

proved to correspond exactly to his description. From these data it was obvious that the condition was hæmoptysis and not hæmatemesis. In hæmoptysis, therefore, the blood is coughed up, and a tickling or gurgling sensation in the throat, such as this patient experienced, is not an uncommon premonitory symptom; the blood may be mixed with the sputa; the amount of blood may vary from a few streaks to a pint or more; it is bright red in colour and frothy, it is usually liquid when it is brought up, but may coagulate in the vessel which receives it; it is alkaline in reaction. If the hæmoptysis is very profuse the blood may simply pour out of the mouth in a stream and rapidly prove fatal. After hæmoptysis has occurred the sputa may be blood-stained for several days; at first it is bright red in colour, but subsequently becomes darker and of a brownish tinge.

In hæmatemesis the blood is vomited and may in consequence be mixed with particles of partly digested food. If the hæmorrhage is considerable the blood may be bright red in colour, and liquid, or clots of blood which are not at all or only slightly altered in colour may be noticed. If the hæmorrhage has been gradual and blood has remained for some little time in the stomach, as it commonly does in contact with the acid gastric juice, it becomes of a brownish colour and has been likened in appearance to coffee-grounds. The cause of the alteration in the colour is the action of the gastric juice which converts the oxyhæmoglobin into hæmatin. It is acid in reaction. The following summary shows at a glance the differences between hæmoptysis and hæmatemesis:—

HÆMOPTYSIS.

1. The blood is coughed up.
2. The blood is bright red in colour and frothy; it is never watery.
3. The blood may be mixed with sputa.
4. The blood is alkaline in reaction.
5. There may be a previous history pointing to pulmonary or cardiac disease.
6. Before the blood is coughed up there is often a sense of tickling or gurgling in the throat.
7. The motions afterwards are not altered unless the patient swallows a good deal of the blood when they may be tarry.
8. Blood-stained sputa may be expectorated for several days after the attack.

HÆMATEMESIS.

1. The blood is vomited.
2. The blood is dark in colour and not frothy.
3. The blood may be mixed with vomit.
4. The blood is acid in reaction.
5. There may be a previous history pointing to gastric or hepatic disease.
6. Before the blood is vomited there may be a feeling of sickness, oppression in the epigastrium, faintness and giddiness.
7. The motions afterwards are tarry in appearance.
8. There is usually no sputa.

These are the differences between the two conditions.

The next point is, that hæmatemesis may be caused by hæmoptysis. This is most likely to occur when the bleeding takes place in the night, the blood being swallowed as soon as it gets into the pharynx, the patient remaining asleep and quite unconscious of the occurrence. Sir Samuel Wilks has drawn attention to the frequency with which hæmoptysis occurs during the night when the patient is at rest; in the majority of instances the incidence of bleeding excites coughing, and the patient wakes. I remember seeing a case which illustrates this point. One morning, when I was Medical Registrar, I came to a woman who had been admitted on the previous day for general weakness and a history of bringing up blood. At about 8 a.m. that morning she had vomited a rather large quantity of dark brownish vomit, which resembled in appearance, and proved on examination to be altered blood. Those who had already seen her had diagnosed hæmatemesis, and had suggested gastric ulcer or cirrhosis of the liver as its probable cause. A careful examination of the front of the chest, care being taken not to move the patient, and percussion as a part of the examination being omitted, revealed very definite signs of phthisis at the left apex, viz., flattening, deficient movement, bronchial breathing and consonating râles. A subsequent examination of the sputa showed the presence of tubercle bacilli, and for some days after the hæmorrhage the sputa were streaked with blood. There were no signs of gastric ulcer, malignant disease of the stomach, or cirrhosis of the liver. The explanation of

the blood being vomited was that hæmoptysis had occurred during sleep, and that the blood had been swallowed as soon as it reached the pharynx. In a small proportion of the cases of hæmatemesis caused by cirrhosis of the liver, signs of phthisis may be found, as alcoholism not only causes cirrhosis of the liver, but is an important predisposing cause of phthisis.

Having arrived at the conclusion that the patient was suffering from hæmoptysis, the next point to ascertain was the cause of this very important symptom.

Hæmoptysis may result from morbid changes in the lungs, bronchi, trachea and larynx.

CAUSES OF HÆMOPTYSIS.

A. *Changes in the Lungs.*

1. Phthisis.

- | | | |
|----------------|---|--|
| | { | Cardiac disease, especially mitral stenosis. |
| 2. Congestion. | | Pressure on the pulmonary veins. { Growth.
Enlarged glands.
Aneurysm, &c |
| | | From violent coughing efforts, <i>e.g.</i> whooping cough. |

3. Injury. { Wounds. Rupture.

4. Pneumonia.

5. Acute tuberculosis.

6. Caseous bronchopneumonia.

7. Infarct.

8. Carcinoma.

9. Sarcoma.
10. Hydatid.
11. Syphilis.
12. Emphysema.
13. Gangrene.
14. Abscess.
15. Atheroma of the pulmonary arteries (primary).
16. Aneurysm of the aorta pressing on and opening into the lung.

B. *Changes in the trachea and bronchi.*

1. Ulceration { Syphilitic.
Malignant.
Secondary to foreign body.
2. Bronchitis { Acute.
Chronic.
Plastic.
3. Bronchiectasis.
4. Aneurysm opening into the trachea or a bronchus.
5. Primary malignant growth of bronchus.
6. Malignant growth of the œsophagus or mediastinum invading the trachea or a bronchus.
7. Ulceration of the trachea opening into the aorta (*e.g.*, following tracheotomy).
8. Perforation of the pulmonary artery by an ulcer of the bronchus, caused by pressure of a calcareous bronchial gland. (Kidd.)
9. Parasitic—The *distomum westermanii*.

C. *Changes in the larynx.*

Ulceration { Malignant.
 { Syphilitic.

D. *Blood diseases.*

Purpura.
Scurvy.
Hæmophilia.
Leucocythæmia.
Malignant variola, &c.

E. *Vicarious menstruation.*F. *Recurring hæmoptysis in arthritic subjects.*
(Andrew Clark).G. *In young healthy subjects.* No obvious cause.

True hæmoptysis, *i.e.*, hæmorrhage from the lungs, bronchi, trachea, or larynx must be distinguished, first of all, from spurious hæmoptysis by which is meant the spitting of blood derived from the nose, mouth or pharynx, *e.g.*,

Epistaxis.

Ulceration of the pharynx.

Stomatitis.

Malingering (sucking the gums, &c.).

A careful examination of the nose, mouth, gums, and pharynx will generally suffice to distinguish this condition, and further, the blood is generally watery, mixed with saliva, and non-aerated. There was no evidence of any morbid condition affecting the above mentioned parts in the patient under consideration.

Phthisis is by far the commonest cause of hæmoptysis. It may be the very first sign of the disease or may be the last, the hæmorrhage being so severe as to cause the patient's death. The amount of blood brought up is very variable.

The sputum may be only streaked with blood, or a pint or more of almost pure blood may be expectorated. In advanced stages of phthisis the diagnosis is not difficult. The flattening, deficient movement, increased tactile vocal fremitus, bronchial breathing, consonating râles, bronchophony and pectoriloquy at one apex, with signs of less advanced disease at the other apex, are distinctive, and the examination of the sputum showing the presence of tubercle bacilli, is conclusive. As above stated, hæmoptysis may be the first evidence of phthisis, the diagnosis is then difficult as the physical examination may not reveal any abnormal signs. Tubercle bacilli may be found in the sputa, however, at this stage, so that a careful examination of the sputa must always be made before a definite or reliable opinion as to the cause of the hæmoptysis can be given. With the exception of emphysema there was no evidence of disease of the lungs in this patient, no tubercle bacilli could be found in his sputum, and he had not suffered from cough or wasting. There was evidence, however, of a definite cardiac lesion. So that, taking all these points into consideration, a diagnosis of cardiac hæmoptysis was made, and not phthisis.

It is a very rare condition to find phthisis associated with chronic valvular disease of the heart, unless it happen to be congenital in origin. This was another point against the diagnosis of phthisis. I shall discuss the diagnosis of the actual cardiac lesion after I have given you a short account of the causes of hæmoptysis associated with phthisis. In phthisis the actual cause of the hæmoptysis is not constant; it may be due to a variety of different conditions.

A 1.—(1) In the early stages of the disease it may be the result of an *inflammatory hyperæmia*, with rupture of the capillaries; the amount of blood expectorated is usually small and may only amount to streaking of the sputum.

(2) The small vessels may actually become inflamed and softened or become infiltrated with tuberculous changes, and, in consequence, rupture if any extra strain is suddenly put upon them, *e.g.*, attacks of coughing. This condition may lead to a more profuse hæmoptysis; it may occur quite early in the course of the disease.

(3) When the disease is more advanced the caseation and the breaking down of the lung tissue may lead to the tearing across of one of the larger branches of the pulmonary artery. This change does not always lead to hæmorrhage, as the lumen of the affected vessel may previously, as a result of the adjacent changes in the lung, have become blocked by a thrombus. I have here a specimen of this nature from the museum, and also another from a post-mortem examination that I performed quite recently. In both these specimens a branch of the pulmonary artery is torn across, and about an inch of the vessel is lying free in the vomica, but in each the lumen of the vessel is closed by an ante-mortem thrombus. Such a condition, however, may cause a very profuse hæmorrhage if there is no thrombus.

(4) The most important cause, is the rupture of aneurysms of branches of the pulmonary artery in cavities in the lung. These aneurysms may be saccular or fusiform in shape, and may vary in size from a pin head to a pigeon egg. They are formed in this manner. A cavity in

the lung is formed by the breaking down of the areas of caseation. In this process, branches of the pulmonary vessels may be exposed on the walls of the cavity, and this leads to a weakening of the vessel wall on the side bordering the cavity, on account of the loss of support entailed by the destruction of the lung tissue. The vessel wall may also be softened as a result of arteritis, and so this weakened patch in the wall of the vessel may yield to the blood pressure, expand and form a small saccular aneurysm which bulges into the cavity. Occasionally a vessel will be seen stretching across a cavity; such a vessel will have lost all surrounding support and may therefore dilate in all directions, and thus form a fusiform aneurysm. The rupture of such an aneurysm will cause a very sudden and profuse hæmorrhage which may rapidly be fatal. I show you this specimen (produced) from the museum. The patient I remember seeing in Mary ward. She brought up an enormous quantity of blood, and died from syncope. I performed the necropsy and found a ruptured aneurysm about half an inch in diameter, in a cavity in the right lower lobe.

(5) In the same week I remember seeing another patient who died as the result of hæmoptysis, and I also performed the necropsy in this case. The lungs showed signs of very advanced phthisis, the left upper lobe contained a large smooth-walled cavity, the wall of which was red and infiltrated with blood. I looked very carefully but could find no trace of an aneurysm in either lung. The appearance of the cavity suggested that the cause of the hæmorrhage was a general exudation from the small vessels in the wall of the cavity.

Next to phthisis *chronic valvular disease of the heart*, especially mitral stenosis, is the commonest cause of hæmoptysis. I have already stated that I considered the hæmoptysis in this particular case was the result of cardiac disease. I did not, however, think the cardiac disease was mitral stenosis, for the physical signs did not point to this lesion, and the absence of a history of rheumatism, chorea, or scarlet fever was also against this view. I came to the conclusion that he was suffering from mitral regurgitation, the result of dilatation and hypertrophy of the left ventricle, the primary cause of which was chronic alcoholism. I have now performed a good number of post-mortem examinations on cases in which I have found hypertrophy and dilatation of the heart with all the signs of backward pressure, without there being any disease of the valves, blood-vessels, or kidneys, in all of which cases there was good evidence of long-continued alcoholism. Alcoholism as a cause of hypertrophy and dilatation of the heart has been recognised at this hospital for some time.

The cause of hæmoptysis in heart disease will be best understood if I describe to you the changes which take place in the lungs as a result of the backward pressure which is set up by stenosis or incompetence of the mitral valve.

A 2.—(1) The first result will be an obstruction to the flow of blood through the pulmonary veins, in consequence of which they themselves and their capillaries become over-distended with blood (passive congestion of the lungs).

(2) In addition there may be a transudation of serum and red blood corpuscles into the tissues of the air vesicles and into the air

vesicles themselves, giving rise to hæmorrhagic œdema.

(3) In more advanced cases the lung becomes tough, semi-solid, and partly airless, smooth on section, and dull red in colour. From its resemblance on section to a section of the spleen this condition is called *red splenization* or *red induration*. The condition is due to a mixture of congestion of the pulmonary vessels—the capillaries of which are dilated, thickened, and varicose—œdema, and actual hæmorrhage.

(4) In a still later stage the colour becomes brown from changes taking place in the blood pigment which has exuded into the connective tissues of the lung. That condition is called *brown induration*.

(5) The lining membrane of the smaller bronchi may show signs of engorgement, and blood may exude from its surface.

(6) Infarcts of various sizes may be found, dependent on the size of the vessels obstructed. The obstruction of the branch of the pulmonary artery involved may be the result of embolism or thrombosis. If due to embolism it has been caused by of the backward pressure which has produced stagnation of blood in the appendix of the right auricle, with consequent thrombosis; the separation of a piece of this thrombus has furnished the embolus. If due to a primary thrombosis, the thrombus has been caused by the stagnation of the blood in the implicated vessel itself. The infarct is usually subpleural, is firm in consistence, and of a dark, browish-red colour. The lung tissue becomes denucleated and necrotic, and the alveoli are filled with coagulated blood. The pleura over the infarct is usually inflamed. A considerable

amount of dark blood may be expectorated when infarcts are present.

(7) Another important change which is almost invariably found in these so-called cardiac lungs is thickening, dilatation and atheromatous degeneration of the pulmonary arteries, a condition brought about by the greatly increased tension produced in these vessels as a result of the backward pressure. Rupture of small branches of such degenerated pulmonary arteries also give rise to hæmoptysis.

A 3.—In cases of *injury* the lung is either wounded or ruptured, and the blood is derived from the severed branches of the pulmonary arteries or veins. There is usually a history of or evidence of the injury.

A 4.—In *pneumonia* the amount of blood expectorated is in the majority of cases slight. The sputum is thick, viscid, tenacious, and generally of a russet-brown colour; It may, however, be bright red. At this stage there is inflammatory hyperæmia of the pulmonary capillaries and actual exudation of blood into the air vesicles. This disease is distinguished by the acute onset, the temperature, pulse and respiration ratio, the characteristic appearance of the sputa and the presence of capsulated diplococci.

A 5.—In *acute tuberculosis* the sputum may be tinged with blood, and it is usually the result of inflammatory hyperæmia. The rapid prostration and wasting, the remittent fever, the cyanosis, and the presence of tubercles in the choroid would point to acute tuberculosis.

A 6.—In *caseous bronchopneumonia* rapid breaking down of the lung tissue may occur, and free hæmoptysis may result from the

rupture or erosion of branches of the pulmonary vessels. I quite recently had under my care a patient suffering from this disease. His illness commenced with rather free hæmoptysis and pyrexia, and a diagnosis of incipient phthisis was made. Four or five days after the onset, as signs of consolidation of the lung were found at the right base, and as the temperature had been high and continuous since the onset, lobar pneumonia was considered. This view was given up when it was found that the temperature still remained high at the end of a fortnight, and that the signs of consolidation were increasing, so a diagnosis of tuberculosis, probably tuberculous bronchopneumonia, was made. He wasted, became cyanosed, the temperature remained high, and the physical signs increased in extent until he died in the fifth week from the onset. Extensive tuberculous bronchopneumonia with recent cavitation was found.

A 7.—*Infarction of the lung* I have already mentioned in connection with its most frequent cause, heart disease. It may also occur as a result of embolism secondary to thrombosis of the systemic veins, infective endocarditis of the pulmonary or tricuspid valves, and from primary thrombosis as in leucocythæmia. A large infarct might give rise to pain, and on examination a local patch of dulness with bronchial breathing and a pleuritic rub might be detected. Hæmoptysis associated with such physical signs and accompanied by evidence of endocarditis or venous thrombosis would suggest infarct as the cause of it.

A 8 and 9.—*Carcinoma and sarcoma of the lung* are usually secondary. The primary seat of the growth may be the bronchus, œsophagus, breast,

mediastinal glands, stomach, &c. The sputum may be tinged with blood, or it may be dark in colour and resemble in appearance currant jelly. Occasionally hæmorrhage is profuse. Hæmoptysis may be due to hyperæmia and to breaking down of the growth, with ulceration or rupture of the branches of the pulmonary vessels, or the growth itself may be very vascular. A large number of cases of malignant growth in the lung are accompanied by pleuritic effusion, and growth may not at first be suspected. If aspiration is performed the fluid is generally found to contain blood. Another important effect of growth is invasion of or pressure on a bronchus. The physical signs are deficient movement, deficient or absent tactile vocal fremitus, dullness, deficient or absent breath sounds and vocal resonance, and accompanying these physical signs progressive weakness and emaciation; no tubercle bacilli are found in the sputum. I remember seeing a case of malignant growth of the lung presenting similar symptoms and physical signs to those I have mentioned, in which the malignant growth had grown into a bronchus, forming a kind of cast of it which broke off and was expectorated. A microscopical examination showed it to be malignant in character, and although malignant disease of the lung had been diagnosed, it helped to confirm the diagnosis. That was one of the most extraordinary cases I have ever seen.

A 10.—*Hydatid of the lungs*.—This is most commonly secondary to hydatid of the liver. Hæmoptysis is one of the most important symptoms; it may be the result of inflammatory hyperæmia, or actual destruction of lung tissue, as hydatid cysts may cause compression of the

lung, and may set up pneumonia or gangrene. The sputum may contain shreds of hydatid membrane, daughter cysts, scolices and hooklets. The physical signs are, perhaps, some local bulging of the thorax, dulness, deficient vesicular murmur, and vocal resonance. These signs may be associated with local enlargement of the liver. Dr. Taylor mentions in his book on Medicine, a case which was mistaken for phthisis. "A girl with cerebral tumour, in Guy's Hospital, had hæmoptysis, and was thought to have tubercle of the brain and pulmonary phthisis, but a hydatid cyst was found in both brain and lung."

A 11.—*Syphilis* may cause ulceration of the larynx, trachea, or bronchi, and hæmoptysis may result, blood-vessels supplying these parts being involved and eroded. It may also give rise to the formation of gummata in the lungs. The gummata may soften, break down and form cavities, and hæmoptysis may result from the formation and rupture of pulmonary aneurysms, as in phthisis. Hæmoptysis is, however, rare; it is most likely to be mistaken for phthisis. A history or evidence of syphilis, and the absence of tubercle bacilli in the sputum would point to syphilis.

A 12.—*In emphysema* the sputum may occasionally be streaked with blood, which may be derived from a congested bronchial mucous membrane, or from the rupture of small capillaries in the walls of the air vesicles. The physical signs are sufficiently distinctive.

A 13.—*In gangrene of the lung* there is a good deal of destruction of the lung tissue, in the course of which pulmonary vessels may be opened. It may be distinguished from other

diseases of the lung by the extremely foetid and penetrating odour of the breath, and by the sputum, which is also extremely foetid, of a greenish-brown or dirty-grey colour, and containing fragments of necrosed lung tissue, and putrefactive micro-organisms.

A 14.—*Single abscess of the lung* is extremely rare. Multiple abscesses may be found as a part of a general pyæmia. The sputum may be streaked with blood, the result of inflammatory hyperæmia.

A 15.—*Primary atheroma of the pulmonary arteries* is another very rare condition. If any undue strain is put upon the lung, when this change is present, such as violent coughing efforts, small branches of the vessel may give way and lead to slight hæmoptysis.

B 1.—Syphilitic, malignant, or tuberculous ulceration of the trachea or bronchi, may cause hæmoptysis by erosion of branches of the bronchial vessels.

B 2.—In *bronchitis* the sputum is occasionally streaked with blood which is derived from the congested blood-vessels of the bronchial mucous membrane. The physical signs, viz., mucous râles and sibilant or sonorous ronchi, which can be heard all over the chest, are characteristic of this disease. Plastic bronchitis is distinguished by the characteristic sputum, casts of the bronchi being expectorated in this disease.

B 3.—*Bronchiectasis* frequently gives rise to profuse hæmoptysis. It may be due to congestion of the bronchial vessels, or to the rupture of an aneurysm of a branch of the pulmonary artery protruding into a dilated bronchial tube. I have now seen a good number of these cases, and they are almost invariably admitted into

the hospital as cases of phthisis. A careful physical examination and an examination of the sputum should enable you to make a correct diagnosis. Bronchiectasis, when it gives rise to hæmoptysis, is usually associated with fibroid change which is not tuberculous in origin. The physical signs of such a condition are: Flattening and deficient movement on the affected side, displacement of the cardiac impulse towards the affected side, *e.g.*, when the right side is affected the cardiac impulse may be in the fifth right space in the right nipple line—increased tactile vocal fremitus, dulness, bronchial breathing, or even cavernous or amphoric breathing over a largely dilated tube, bronchophony, pectoriloquy, and loud consonating râles. With the exception of some compensatory emphysema the other lung may show no evidence whatever of any morbid change. Another characteristic sign of bronchiectasis is the expectoration of a large quantity of sputum, half a pint perhaps or even more, in the early morning, soon after the patient wakes and begins to move about. In phthisis, if one lung should give signs of such advanced disease, there would certainly be evidence also of disease in the other lung. You have never seen in the post-mortem room the whole of one lung effected by phthisis and the other quite free. In fibroid lung and bronchiectasis, on the other hand, you may have seen, or will see cases in which the whole of one lung is affected, the other being quite free.

B 4.—*An aneurysm of the aorta* may open into the trachea or a bronchus; the hæmorrhage in such cases is usually profuse and rapidly fatal. Occasionally a slight leakage causing moderate hæmoptysis may first occur. An

aneurysm may also press on the lung and open into it, giving rise to hæmoptysis in this way. Before opening into the trachea or a bronchus, an aneurysm usually first erodes the cartilages, and then bulges into the lumen of the trachea or bronchus. Aneurysm must be distinguished by a careful physical examination. A tumour, pain, pulsation, a bruit, and signs of pressure, *e.g.*, inequality of the pulses, unequal pupils, recurrent laryngeal paralysis, and tracheal tugging. I have already alluded to primary growth of a bronchus as a cause.

B 5.—(1) *Esophageal growth* may cause hæmoptysis by invading the lung or trachea. It is usually preceded by dysphagia and rapid emaciation, and the diagnosis is not as a rule difficult.

(2) *Mediastinal growth* may invade the lungs, trachea or bronchi, and thus cause hæmoptysis. It is distinguished chiefly by its pressure effect on the superior vena cava which gives rise to œdema of the arms, neck, and upper part of the chest.

(3) In China, Japan and Formosa hæmoptysis may be caused by a parasite, the distomum *westermanii*, which invades the bronchial mucous membrane.

C. Ulceration of the larynx may cause hæmoptysis by erosion of the laryngeal vessels. It may be distinguished by signs of laryngeal disease, huskiness, aphonia, pain, &c., and by laryngoscopic examination.

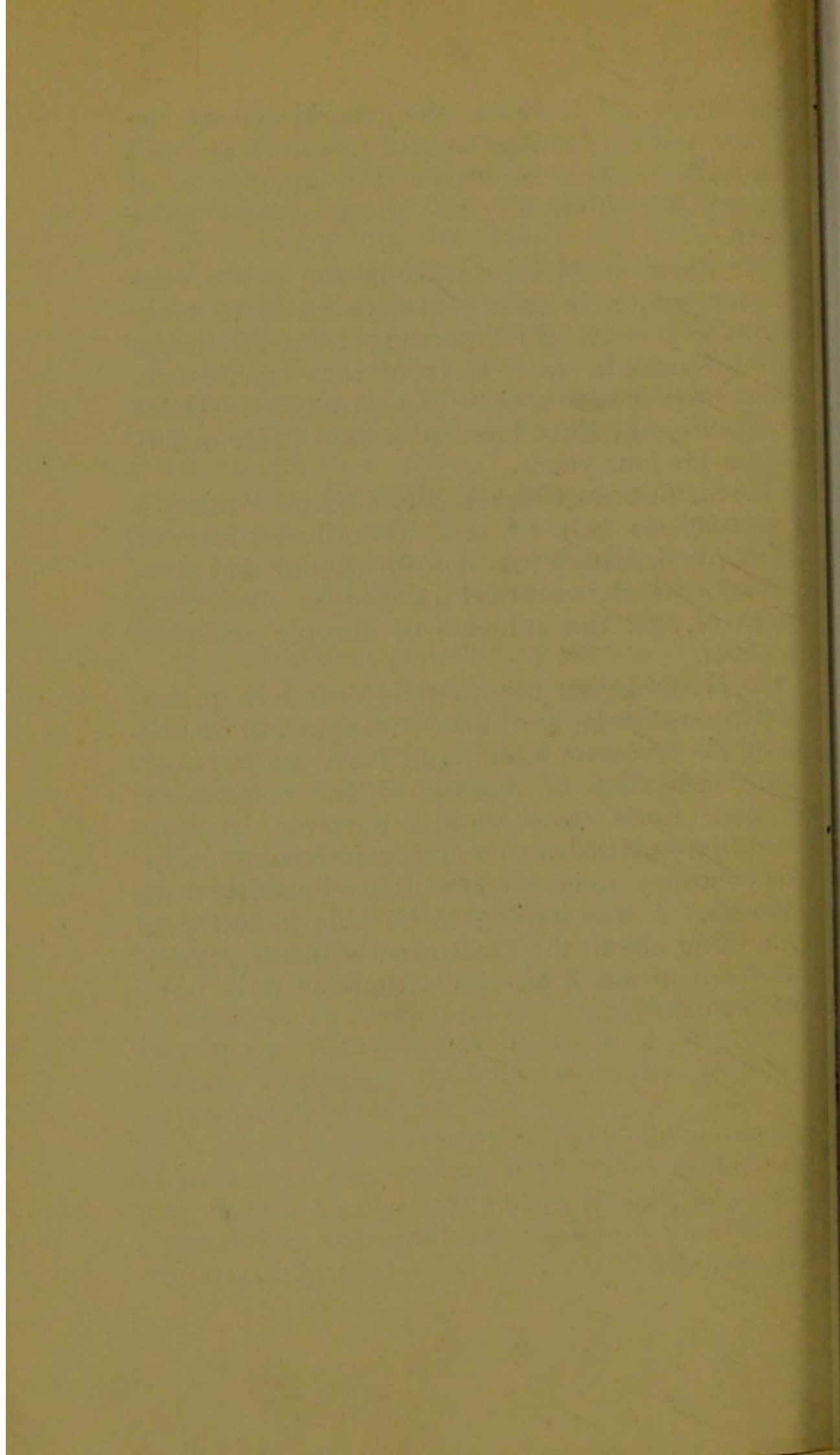
D. Blood diseases may give rise to hæmoptysis as well as to hæmorrhage from other parts. It may be due to changes in the vessels, or to an alteration in the condition of the blood, both of which conditions may lead to hæmorrhage.

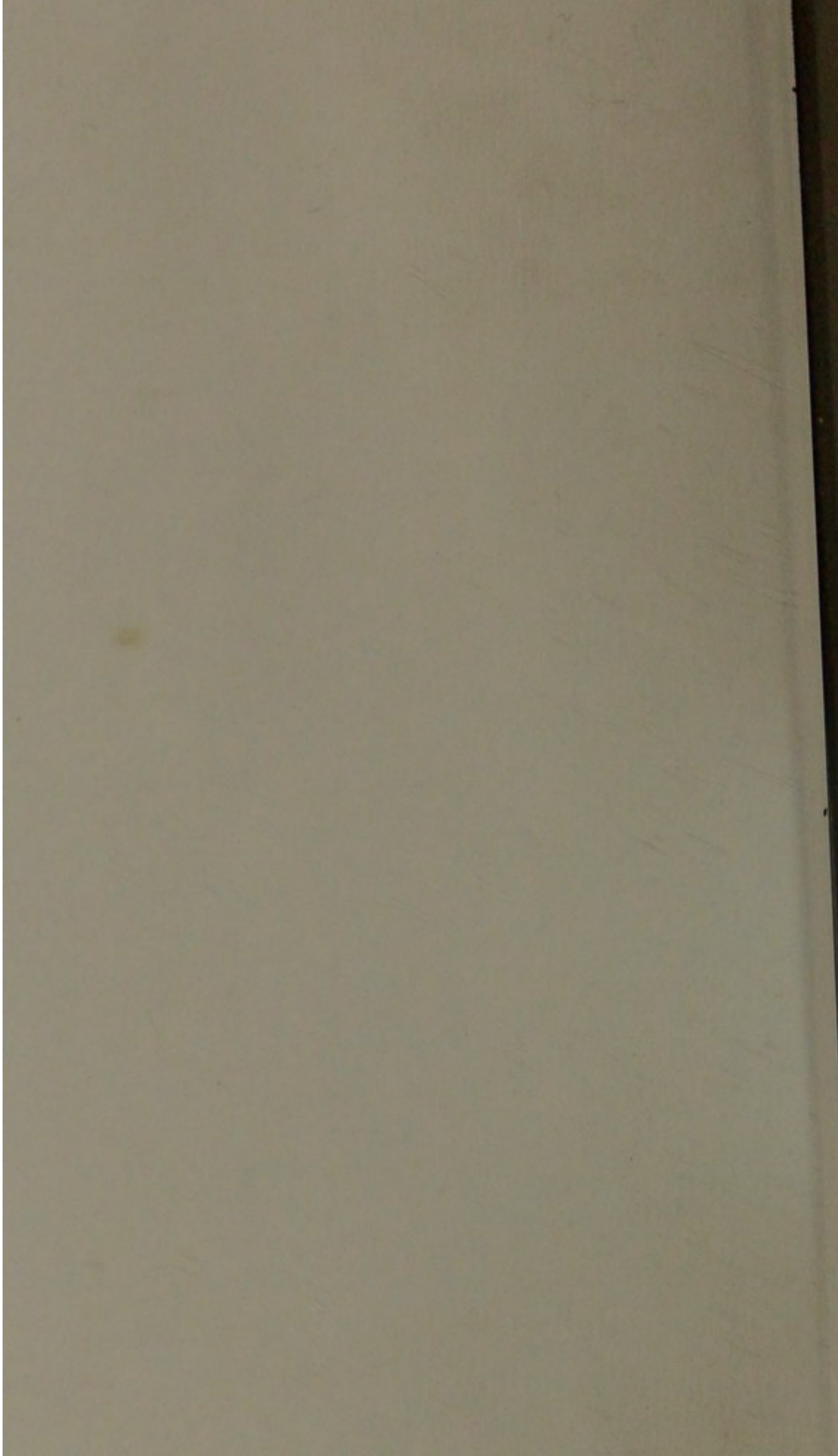
The history of the case, the general appearance of the patient, and a careful examination will generally suffice to make the diagnosis of hæmoptysis from any of these causes quite clear.

E. *Vicarious menstruation* is one of the conditions which is nearly always given in text-books as a cause of hæmorrhage from the lungs, nose, stomach, &c. It is of rare occurrence. I have never seen a case of this nature. Osler mentions that Flint has had a case under observation for four years.

F. Sir Andrew Clark, in the Medical Society's Transactions (vol. 13, p. 9), described a form of hæmoptysis which was non-tubercular and non-cardial, which occurred in people over fifty years of age, the subjects of chronic arthritic changes.

G. Hæmoptysis occasionally occurs in young healthy subjects, and may disappear in a few days, never occur again, and leave no physical signs indicative of disease of the respiratory organs. Such cases should, however, be very carefully watched, as hæmoptysis coming on in this manner may be the first indication of phthisis. I was hoping to be able to tell you something about the treatment of hæmoptysis, but I am afraid I have not time as it is now two o'clock.







DICTY-

SOME TIGHT
GUTTERS

