Thesis for M. D. on Influenza by Edward Robinson, M.B.C.M. April 1897.
Influenza, its history, pathology, and clinical features with special reference to Pneumonia as a complication.

Influenza has long been known to us in England as a disease of a very interesting character; but of recent years the interest in it has been greatly increased insomuch that its prevalence has been more general and the sequelae and complications have been most disastrous to human life.

After first giving a sketch of the history and clinical features of Influenza and briefly referring to its pathology, I wish specially to treat on the lung complications which attend and follow on attacks of Influenza as I consider that they play the more important part being, if unrecognized, so dangerous to the patient.
Until recently Influenza had been for many years in the background, because long and virulent epidemics had not appeared in this country for a long period until December 1889, when what was called the Russian Influenza came among us as a great sheet of woe shrouding many in death. The history of this disease seems to point to its lying dormant for varying periods, and then breaking out afresh and spreading rapidly, quickly affecting great numbers in the particular districts where it manifested itself.

The different epidemics though showing great similarity, evidently varied to a certain extent. Thus in some outbreaks children were nearly exempt from attack, whilst in others the mortality in infant life was great.

In like manner the after-effects appear to have affected different systems in different epidemics. We find Cope-land saying that in 1737, obstinate
Rheumatism was a common sequelae, but that in 1837 Sciatica was often observed to follow on a bad attack of Influenza. In our own time a slowly progressing Pneumonia is frequently met with.

The earliest recorded outbreak was, according to Copeland, in 1237, since which time Influenza has exhibited itself at longer or shorter intervals. It was then called Epidemic Catarhal Fever. In 1387 according to Valerio of Tarentum, scarcely a tenth of the population escaped attack in an outbreak he described. In this outbreak young children were almost immune, the aged and rheumatic suffering most. The name Epidemic Catarhal Fever was applied to it because it occurred in outbreaks, spread rapidly, striking down large communities in quick succession, and the complications which attended it were mostly of a catarhal nature. Bronchitis and pneumonia held the most—
prominent positions, and were most fatal in asthmatic people and those suffering from chronic catarrhal bronchitis.

Passing over a wide expanse of time, we come to a very severe epidemic in England in 1837. It first appeared in London and soon thousands were down with it. Outbreaks occurred later— in 1837, 1847, and 1848. The rapidity with which these epidemics spread is manifested by the fact that in one or two days great numbers in a wide area were afflicted. Dr. Southwood Smith says that Influenza broke out in London in 1847 and in a single day spread over every part of the metropolis, affecting upwards of 500,000 persons.

What occurred in December 1889 resembled very closely these former epidemics. Influenza was prevalent in Russia and other parts of the continent, when suddenly it appeared in England, and in a very brief period immense numbers were down with it. Since
then it has been so common that one can now safely assert that it forms the most important part of a general practitioner's work, not so much in itself as owing to the complications which attend it; and it is to Pneumonia as a complication that I wish to pay most attention.

Pathology.

The nature of Influenza long remained obscure. The old writers said that the poisonous influence, whatever it might be, winged its way with greater celerity than the speed of human intercourse; that its progress was uninfluenced by the season of the year; that it appeared to spread from East to West, and rarely stayed in one locality more than six or seven weeks. Copeland says that the reasons and the state of the atmosphere, both antecedently and at the time of an outbreak—whether appearing in Spring, Summer, Autumn or Winter, in cold and moist or mild and dry weather—
had no share in its production. No matter when it occurred, it presented the same clinical features, and though appearing at a time of the year when bad attacks might be expected such did not occur, though under such circumstances the after-effects were more frequent and severe. The almost simultaneous outbreaks in countries remote from each other; the rapidity with which it traversed immense spaces; the appearance of its pursuing in its course a different path to that of human intercourse; the great number attacked almost at the same time when it appeared in a town or district; and the frequent suddenness of the seizure, seemed to point out to the old school of physician that the cause of infection depended on atmospheric influences, rather than on direct infection and contagion. Still they also admitted the fact that it might be conveyed directly from person to person, for when an
individual suffering from Influenza arrived from a distance, probably an outbreak would occur, and the inhabitants of the house he was visiting would be the first to fall. Recent research and study, whilst increasing our general knowledge of the clinical features of Influenza, have done still more to elucidate its essential nature. We can now recognize the real cause and thus are able to make a sure diagnosis and to judge better of its mode of spreading. This discovery we owe to Dr. Pfeiffer who discovered and photographed the organisms which are named after him "Pfeiffer's Bacilli". He found these bacilli to be abundant in the sputum of people attacked with Influenza. He observed them especially in that thick, viscid, tenacious sputum, with which asthmatic and bronchitic patients are so loaded when suffering from Influenza and which they find most difficult to expectorate if they are weak and debilitated. The sputum is yellowish-green in colour,
is expectorated in hard lumps of a mum- 

ular character, and is found on post-mortem 
in the nose, pharynx, bronchial tubes, 
and the air cells of the lungs. Pfeiffer 
examined principally the bronchial 
mucus, and discovered the characteristic 
organism. He described it as presenting 
the appearance of short, slender rodlets, 
staining with Carbol Fuchsin more 
distinctly at the extremities than in the 
centre. He found it principally free, 
though also in the protoplasm round 
the nucleus of pus cells. The proof that 
the bacillus of Pfeiffer is the essential 
cause of influenza depends on the fact 
that it is always found in the catarrhal 
discharges of influenza patients and is 
not met with in other diseases. As to the 
distribution of the bacilli, they are principally found in the mucous membrane 
and neighbouring tissues of the respira-
tory passages and in inflamed patches 
of lungs, but do not appear to thrive, 
though occasionally found in the blood. 

As I have already pointed out, in
former times much stress was laid on the importance of the atmosphere as a conveyance of the disease, and little note was made of contagion as an important factor in the spread of an outbreak. A great point to prove that Influenza was conveyed by the atmosphere in Easterly directions was made of the case of the ship "Stag," which on the day in 1833 when a most rapidly spreading epidemic of Influenza broke out in London was making way up the English Channel along the Devon coast. It is asserted that an east wind sprang up and blew from the coast towards the ship, and that in half-an-hour forty men were down with Influenza, and that by the end of the next day one hundred and fifty of the crew were suffering from it. They concluded that the east wind blowing over a district contaminated with Influenza had conveyed the infection which produced the outbreak on board ship. This sudden outbreak at sea in a line of a breeze blowing from an
infected districts, is perhaps rather difficult to reconcile with the direct-infection theory. Dr. Franklin Parsons in his report to the Local Government Board, made a special point of this fact. He made strenuous efforts to find similar instances of epidemics in ships at sea, and at lighthouses where the occupants had had no communication with shore on land affected with Influenza. He was not able to cite a single case. On the contrary Dr. Parsons in his report brings forward strong evidence to prove that the epidemics of Influenza do not travel faster than man as was formerly supposed, and that their courses do not correspond with the prevailing winds but tend rather to pursue an opposite direction. He points out that country places as a rule remain free from towns on account of less human communication and that on the contrary badly ventilated and overcrowded habitations present the greatest number of cases. He also says that those in the habit of attending public gatherings are
the
most likely to catch it. The rapid mode
of travelling of the present day, coupled
with the shortness of the incubation period,
afford a most satisfactory explanation of
the speedy spread of Influenza.

Clinical Features.
The clinical features of Influenza
present many interesting points. In
the first place Influenza does not appear
to confer any immunity, as people who
have once suffered from it very often
have repeated attacks, indeed they seem
to have a proclivity for it. In this
Influenza differs markedly from the
exanthemata, a patient for instance
rarely suffering from a second attack
of Scarlet Fever or Small Pox. Another
feature is the long continued weakness
which often follows an uncomplicated and
even mild case. This weakness is usually
of a nervous type. This is shown by the
malaise, severe head-ache, peripheral
neuritis and profuse perspirations which
often supervene, with depression of spirits.
or pronounced melancholia and even insanity.

In dealing with the symptoms of influenza, I wish first to describe a typical simple and uncomplicated case leading to a natural recovery. The first complaints that a patient makes are that he has had a shivering and that he cannot keep warm, that his head aches (most generally in the frontal region), and that his eyes feel heavy. The back of his neck is stiff, also his loins, limbs and other parts. The tongue presents a white fur, the fauces and posterior pharynx are congested, painful and dry. Appetite and taste are lost. He is thirsty. Constipation often exists though diarrhea is occasionally present. The skin is generally clammy, or the patient may be bashed in a profuse perspiration. On the other hand, the skin may be hot and dry and may even present a general blush almost resembling scarlet fever. The cases in which the action of the skin is deficient are usually the slowest to recover. The urine is deficient.
in quantity and high coloured owing to being loaded with urates. The specific gravity is slightly increased.

The temperature rises rapidly, but varies in degree, some cases presenting much fever whilst others have very little. In a mild case the temperature may never be higher than 100° or 101° and falls immediately the patient has had a copious sweat. On the other hand the temperature may be as high as 104° or even more and is accompanied with severe headache and much constitutional disturbance. The temperature falls quickly usually in three or four days but the pains in the head and loins, etc, do not leave the patient so soon. They often remain for some days after the fever has abated. The pulse is often rapid and irregular and there may be some loss of rhythm in a case accompanied by much fever. On the other hand cardiac depression often accompanies or follows on an attack and then the pulse is usually very slow.

The same amount of catarrh that charac-
Derived the earlier outbreaks has not occurred in the recent epidemics, a dry harsh cough being generally present, except in the old and bronchitic. Their lungs become loaded with mucus which is very difficult to expectorate as it is so hard, tough and sticky. Hence it is that influenza in the old is attended with such a high death-rate.

The above therefore, accompanied by nervous and muscular prostration, with much languor, debility and depression of spirits, are the symptoms generally to be met with.

The treatment of course varies greatly with the age and constitution of the patient. A young strong adult requires little more than rest in bed and warmth with light diet in order to give the heated stomach—as evidenced by the furred tongue and loss of appetite and taste—as little work as possible. Attention to the above with a febrifuge mixture, such as salicylate of Soda in moderate doses, or quinine...
or a simple alkaline mixture consisting of liquor ammoniae acetatis and bicarbonate of potash, will usually suffice.

Anti-pyrin, anti-febrin or phenacetin are advantageous in those cases in which there is severe frontal headache. The great depression and the profuse sweating which are often present warn us not to give salicylate of soda or salicin with too much freedom, or for a protracted time. Moderation should also be exercised in the use of antipyrin, etc., on account of the depressing action these drugs have on the circulatory system, especially when we remember that cardiac asthenia is a common accompaniment of influenza.

In those cases where the skin is hot and dry and the urine scanty a hot-air bath is highly beneficial causing the skin to act freely and reducing the temperature speedily. Stimulants are often necessary to start diaphoresis when giving a hot air bath and also to guard against the depressing action such baths often have on the heart. After the patient has passed
over the acute stage and is able to get up and to gradually resume his natural diet, a tonic consisting of the compound tincture of cinchona with aromatic tincture of spirits of ammonia and nux vomica should be given. As before mentioned, even uncomplicated cases are often followed by an unusual degree of prolonged weakness and depression. Such cases require a thorough change into the country.

Where there is persistent neuralgia and muscular pain a thin mixture consisting of Quinine, Iron and Arsenie will generally be found most beneficial.

In children great care and attention must be paid to the respiratory system, as bronchitis and catarrhal pneumonia are very apt to develop in the infant. The inference is, therefore, in the young to treat Influenza by a stimulant—cough mixture should the least sign of catarrh be present.

It is in the old asthmatic and chronic bronchitic cases that Influenza proves most fatal and these require by far the
greatest care and attention in their treatment. In them the disease might be aptly styled by the old cognomen Epidemic Catarhal Fever, as all its energies seem directed to attacking the chest and pouring out into the lungs a profuse adhesive mucus which fills the bronchial tubes and is most difficult to cough up, but which if not expectorated seems as if were to drown the patient in his own tenacious bronchial exudations. The object of our treatment must be to keep the patient's strength up, and to help him to get rid of his phlegm. This can best be done by giving plenty of light, easily digested nourishment, and stimulants (in the way of brandy and stimulant expectorants), and by trying to soften the mucus and to lubricate the bronchial tubes. We should therefore give alkaline, steam inhalations with some antiseptic to destroy the characteristic bacilli which are found to exist abundantly in the mucus. Perhaps if more attention were paid to our present
knowledge of the pathology, and in these wheezy old individuals showing signs of Influenza, an antiseptic inhalation of Eucalyptus, Menthol, or Terebene was immediately resorted to, so excessive an excitation of mucus might be checked. By making free use of the bronchitic Kettle and by giving a stimulant and expectorant mixture containing carbonate of ammonia, tincture of senega and squills, and tartarate of antimony substituting the two latter with digitalis & strychnine if the heart requires it, we combat Influenza in the aged.

Let us now consider Influenza when complicated by Pneumonia. Many and varied are the forms in which pneumonia as a complication of Influenza may be met with. No doubt the commonest form of lung complication is that met with as before noted in old asthmatic people. Typical cases of croupous and catarhal pneumonia frequently occur; but the
form of pneumonia I am going to treat on is one which might best be termed
Influenzal Pneumonia, pneumonia Consolidation. I will therefore proceed to
cite three cases picking them out from among many that I have had the opportu-
nity of observing as I think they exemplify best what I wish to describe.

Case I.

Miss B. aged 46 had enjoyed good health till January 1894 when she
suffered from Influenza. She complained of feeling chilly, her limbs, back and head
ached. Her temperature was 102° and beyond a slight dry cough, furred tongue, and
loss of appetite, no other symptoms pre-
vented themselves. I ordered her to bed,
restriected her to light diet and gave a
mixture consisting of salicylate of soda
and chlorodyne, with some five-grain
en phaeolin powders to be taken if the head
continued painful. Next day I again
saw her and found the temperature
reduced to 99°, the head better and the
muscular pains greatly relieved. In
fact she was so much better that I did not visit her the following day. On the fourth day I called and found her sitting up in front of the fire with a normal temperature and to all appearance better, except that much weakness remained. The following evening I was summoned to see her. I found my patient sitting up in bed and breathing rapidly, with a quick pulse and temperature 107.5°. She complained of pain all down the left side. I examined her carefully and found on inspection rigidity of the whole of the back of the left side of the thorax, being most marked in the lower part. On palpation I confirmed the above and found vocal fremitus much diminished. There was no pleuritic fremitus. On percussion I found dulness and increased sense of resistance in the infra-clavicular and infra-axillary regions. On auscultation the breath sounds were faint, vesicular in character over the same areas. Friction sounds were to be heard over the lower-
part of the back of the lung. No crepitations were present, vocal resonance was diminished. There was a dry cough and but little expectoration. Next day I again carefully examined the chest with the result that I elicited a duller note on percussion. On auscultation the breath sounds were still faint but some fine crepitations could be heard at the end of inspiration. Friction was less marked. Vocal fremitus and resonance remained much diminished. The case presented little change for a week. Then the breath sounds became harsh with prolonged expiration and gradually tubular in character. The crepitations increased and became coarse. Eventually the lung began to break down and the patient expectorated large quantities of purulent mucus having a most offensive odour. She slowly got weaker and passing from bad to worse died in June, much emaciated and continuing to the last to expectorate large quantities which smell...
grievously. The treatment I adopted was in the first instance locally mustard then linseed poultices and cotton-wool padding, and in the later stages flying blisters. Medically, early I gave febrifuges and then stimulants and stimulant expectorants and bark and ammonia. Inhalations of creosote and menthol and eucalyptus were alternately freely tried. The diet consisted chiefly of milk with beef tea and malt extracts and petroleum emulsion.

Case II.

A little girl aged 7 suffered from influenza in February 1896. She presented the usual symptoms and appeared to be getting on nicely until the third day when she complained of pain all down the right side of the thorax. The pain was not very acute but was worst about the inferior angle of the scapula. There was a dry cough, which was paroxysmal and the pain in the side was increased during the paroxysms. No sputum was brought up, the temperature
was 107.4°, the pulse rapid. On examining the chest, inspection and palpation showed expansion to be less on the right side than on the left. There was no pleuritic friction; vocal fremitus was diminished. On percussion the whole of the back of the lung yielded a dull note, most marked towards the base. The percussion note in front was normal. On auscultation the breath sounds were faint, and vesicular, and accompanied at the end of inspiration by a few expectations and slight friction. Vocal resonance was diminished. Comparing this case with the former, I came to the conclusion that I again had a case of consolidation of the lung accompanied by pleurisy to deal with which differed greatly from an ordinary case of pneumonia. I directed my treatment principally towards keeping my patient strength up by good light diet consisting chiefly of milk and beef extracts and prescribed a mixture of the tincture of perchloride of iron and liquor ammoniae aetatis. The child
remained thus with little alteration in the pulmonary physical signs for two weeks. The temperature during this time varied little. For the first ten days it kept up, ranging between 101° and 102°. After that the thermometer generally registered between 99° and 100° and at the end of the fortnight the temperature had returned to normal. The physical signs which might almost be said to have taken the same course. As the temperature gradually sank, expansion became more marked and the percussion note less dull. Vocal fremitus returned to normal and the breathing became more audible and vocal resonance became re-established. The cough which all through had been attended with very little sputum disappeared and my patient gradually got well and strong again. There was a case of consolidation following influenza in which the lung yielded a dull percussion note with diminished vocal fremitus and resonance and no tubular breathing. On the other hand the breath sounds were faint
and accompanied by slight friction and a few expectorations.

Case III.

This case presented many of the features of the previous one. I attended Mrs J. during an attack of Influenza at the beginning of February 1896. At the end of a week—up to which time she seemed to be getting better—she complained of a pain in her right side and her cough was increased. Examination showed the same physical signs as in Case II.

Inspection showed diminished expansion of the right lung. On palpation vocal fremitus was almost absent. The percussion note was very dull from the spine of the scapula to the base of the lung and in the infra-axillary area. No alteration in the percussion note was present in front. The breathing in this case was faint and vesicular and friction was found over the lower part of the lung with some expectorations. The vocal resonance was much diminished. The features of this case throughout were very similar.
to the previous one, and I adopted the same line of treatment. The signs presented by the lung continued the same with very little change till the last week of February when the dullness became less marked, vocal fremitus and resonance gradually became more appreciable, and friction and crepitation disappeared. The temperature which had remained usually elevated, varying from 101° to 99° and never at its highest exceeding 102° gradually returned to normal.

Let us now compare these cases with diphtheria. First as to the onset. Diphtheria usually commences with rigor and sudden rise of temperature to 103° or 104°. There is well-marked pyrexia with loss of appetite, furled tongue and general malaise. The patient bears a characteristic aspect. Though there may not at the earliest be complete dullness on percussion, this rapidly supervenes and vocal fremitus is markedly increased. The dullness is
usually confined to one part of the lung, most generally the apex or the lower lobe. Auscultation early yields fine crepitation and a rusty sputum is expectorated. It has been shown that the commencement of Influenzal Pleuro Pneumonia is not marked by the same amount of constitutional disturbance. There was no rigor, nor did the temperature rise suddenly to a high degree as in none of the three cases it was never higher than 102°. The physical signs differ greatly; though there is dullness vocal fremitus is diminished in influenza instead of being increased, the dullness is more diffuse and not confined to any particular lobe. Auscultation rather resembles some cases of croupous pneumonia at their onset by the vesicular murmur being deficient, but in influenza it remains so whilst in croupous pneumonia it rapidly becomes tubular. In case I the breathing gradually became bronchial. This no doubt was due to the breaking down of areolar tissue and dilatation
of the bronchi. Vocal resonance instead of being increased as in croupous pneumonia is much diminished and though crepitations are to be heard they do not resemble the fine ones characteristic of the early stages of croupous pneumonia.

In comparing the advance of the cases we find great difference. The characteristic appearance of the patient suffering from croupous pneumonia is not observed. We do not get the flushed cheeks, the bright eyes, nor the vivid consciousness of distress. The breathing and the pulse though accelerated are not increased to such a great extent. Cough is present but is softer and drier and the typical clinging rusty sputum is wanting. The urine is not so deficient and high coloured. The lung symptoms do not show the same changes because the crepitations instead of becoming coarse gradually disappear and vesicular breathing does not become tubular.

Vocal resonance and tympany remain diminished. The same rapid changes
do not occur in Influenzal Pneumonia. There is no crisis. For the temperature does not suddenly fall as in croupous pneumonia from being 105° to normal or even sub-normal, the patient at the same time finding sudden and great relief. The whole clinical course seems to follow a different path. The changes seem neither so rapid in their onset nor so quick in their retrogression. They undergo a more gradual progression and are unaccompanied by so much constitutional disturbance. The pulmonary mischief seems to start more as a diffuse pleurisy affecting usually nearly the whole of the back of the pleura of the affected side. The inflammation from the pleura seems to affect a layer of lung tissue beneath it which becomes consolidated. This consolidation runs a slow course, gradually clearing up, and unattended with much elevation of temperature or acceleration of pulse and respiration. As the lung becomes consolidated one would
expect to have vocal fremitus and resonance increased, and tubular breathing. I think the fact of not getting such is to be explained by the probability of only a shallow part of the lung being consolidated, and the pleura being thickened by exudation the transmission of the breath sounds that are thus impeded. For one notices in cases of Influenzal Pneumonia where no pleurisy has occurred we get vocal resonance and fremitus and tubular breathing, and usually more crepitations. The same happens if much of the lung be consolidated even in the presence of pleurisy. In fact the physical signs in these cases are much the same as in croupous pneumonia, the difference between the two lying principally in there not being so much constitutional disturbance in Influenzal cases. Sub-acute as this particular form of pneumonia usually is, most fatal terminations supervene if the medical attendant of the patient
relax in the least, in the case of the
former their vigilance and attention
or in the case of the latter, their patience
and care in following out the instruc-
tions given by the physician. This the
patient is apt not to do, as in many
cases he does not feel so ill as his pul-
monary symptoms indicate. I am
firmly of the opinion that many
fatal lung cases following on Influenza
are the result of this slow ingravescent
pneumonic complication not being early
recognised, and the patient being
allowed to expose himself to risk of
fresh chill. Thus from being a
simple case from which the patient
would soon recover, it becomes one of
imminent danger.

I have endeavoured in this sketch of
Influenza to show that it has long been
recognized as a distinct disease, an
outbreak having been recorded as far
back as 1237; that it has appeared at
intervals as an epidemic and that there
epidemics have varied much in character first as regards influenza itself and secondly as regards the complications and sequelae. The advance of science has pointed out to us the true nature of the disease by showing that atmospheric influence does not play the most important part in the production and spread but that direct infection by the Pfeiffer Bacillus is the true cause.

We have seen that an uncomplicated case of influenza rarely ends fatally and is best treated by observing great care with regard to warmth and rest and by employing measures to allay the fever and the attending prostration which in many cases is a very pronounced accompaniment. Our chief endeavours must be directed to forestalling the after-effects which frequently arise and to combating the pulmonary complications. We have seen how these complications appear in many different forms being sometimes typical either of croupous or catarrhal
pneumonia, whilst at other times we meet with cases which do not follow either of these forms but present many differences both as regards the local signs and constitutional symptoms which are both often very obscure. After exemplifying this fact by describing three cases, I have compared them with a typical case of pneumonia. All that remains to be said is to point out that influenza at present forms a most important part of a general practitioner's work and that his energies must be chiefly directed to keeping careful watch on the respiratory system and to guard against the complications likely to ensue.