Moncrieff and Weller (1949) in a preliminary communication have given encouraging reports on the use of chloramphenicol in this disease.

It therefore seems that we are at the moment up against a disease which, be it virus in origin or not, kills by virtue of penicillin- and sulphonamide-resistant bacteria, and that the newer antibiotics may be the weapon for which we are seeking to combat it. This is of course true, as has been briefly mentioned, in cases of penicillin-resistant bronchopneumonia and bronchitis; but acute laryngo-tracheo-bronchitis has been stressed here because of the extreme rapidity of its course, and because if the patient is not treated promptly and energetically with a suitable antibiotic no second chance remains.

Summary

A case of acute laryngo-tracheo-bronchitis is described in its clinical course and pathology.

Treatment is discussed in view of the increasing incidence of penicillin-resistant bacteria.

It is stressed that, owing to the rapid and fatal course, the first line of treatment must be with one of the newer antibiotics.

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X-RAY EXAMINATION IN "PNEUMONIA"

BY

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Various opinions have been expressed on the advisability of radiographing cases of "pneumonia." Some people advocate x-raying every case; at the other extreme are those who believe that such a course is unnecessary and that in general practice the need arises only occasionally. This article has been written with the object of trying to assess the usefulness of radiography in cases of "pneumonia."

The term "pneumonia" has been used to describe a symptom-complex affecting the respiratory system. It consists of several, and sometimes all, of the following symptoms: malaise, fever, cough, pain in the chest, sputum, dyspnoea, and haemoptysis of small amount. The general picture of every patient in this series has been such that during the acute stage of the illness a diagnosis of pneumonia of bacterial origin, atypical pneumonia, or pneumonitis might have been justified from a consideration of the symptoms and physical signs alone. The diagnosis in these terms was made either by the general practitioner referring the patient or by the writer. Cases with the syndromes designated by the terms influenza, dry pleurisy, and pleurodynia have been excluded. Cases sent up correctly diagnosed as something other than "pneumonia"—e.g., pleural effusion, spontaneous pneumothorax, neoplasm, etc.—have been excluded whatever their symptoms. The

cases discussed were consecutive, and were selected because they showed an abnormality on radiography. All were followed up until a normal skiagram was obtained or a clear diagnosis of disease arrived at. With these criteria 228 cases, referred during 18 months, were selected.

The patients were all referred to, or a second opinion on them was sought from, this chest clinic, which is situated in a county town of about 60,000 people. The surrounding countryside and small towns augment the total number covered to over 140,000. The series is in no way unusual unless it be exceptional for a large percentage of the surrounding practitioners to be intent on diagnosing pulmonary tuberculosis early, and to be aware that this is better done by radiography than by the stethoscope.

Classification of Cases

The cases can be divided into three groups in accordance with when they were first seen. (1) Those referred during an acute illness suggestive of pneumonia, often after no response to the sulphonamides and penicillin. (2) Those referred specifically as having recently had pneumonia and as having failed to resolve normally, or because the practitioner wished to be assured of normality. (3) Those referred for an opinion as being suspected cases of pulmonary tuberculosis after an acute illness suggestive of pneumonia but variously diagnosed.

Table I shows the number in each group, and divides them into the age groups 0-14 and 15 upwards.

TABLE I

Age	Group 1	Group 2	Group 3	Total
0-14 ..	1	19	28	48
15+ ..	37	93	50	180
Total ..	38	112	78	228

In Group 1 there were 11 cases which resolved normally and 27 which either presented complications or were not pneumonia. In Group 2 the corresponding figures were 61 resolving normally and 51 others. In Group 3 the figures were 55 resolving normally and 23 others.

In Table II the abnormalities apparent on radiography are listed, and the number occurring in each group is shown.

TABLE II

Abnormality Found	Group 1	Group 2	Group 3	Total
Pulmonary tuberculosis ..	9	20	3	32
Delayed resolution ..	4	12	13	29
Empyema ..	4	2	1	7
Sterile serous effusion (non-tuberculous) ..	2	2	1	5
Tuberculous effusion ..	1	4	1	6
Bronchiectasis ..	2	8	1	11
New growth ..	2	1	1	4
Lung abscess ..	1	0	0	1
Spontaneous pneumothorax ..	1	0	0	1
Cardiac ..	0	2	1	3
Cough fracture ..	0	0	1	1
Death (post-operative pneumonia)	1	0	0	1
Total ..	27	51	23	101

Out of the 228 cases referred with the symptom-complex of "pneumonia," 127 resolved normally and were classed by the writer as pneumonia, atypical pneumonia, or pneumonitis. Out of the other 101 cases one, a patient with post-operative pneumonia, died; 29 ultimately resolved completely, but with varying periods of delay, and 12 others suffered direct complications of their pneumonia. In a further 19 a second condition as well as pneumonia was present, being brought to light by radiological examination. This group included three cases of known phthisis.

Finally, 40 cases were judged to have diseases other than pneumonia. These conditions will be briefly analysed under appropriate headings.

Complications of Pneumonia

Delayed Resolution.—This term has been used when abnormal shadowing, ultimately disappearing completely, was still present at least three weeks after the first radiograph was taken. In practice, as the radiograph was usually taken about 7 to 14 days after the beginning of the illness the period was often longer than three weeks. Twenty-nine (about 15.5%) fell into this category. This high figure cannot be compared with any obtained from an average series of pneumonias, as many cases were referred because the illness was in some measure atypical. It has been affirmed by Davies *et al.* (1935) and Morgan and Wylie-Smith (1943) that delayed resolution is commoner in the older age groups. Their belief was not sustained by this investigation, in which four were below the age of 15, eight above 40, and the remaining 17 spread evenly between these ages. Table III presents these figures in more detail, showing the number in each age group and the percentage affected by this complication.

TABLE III

Age	No. with Pneumonia	No. with Delayed Resolution	Percentage with Delayed Resolution
0-14	47	4	8.5
15-40	84	17	20
41+	57	8	14
Total	188	29	15.5

In the majority of these cases there were no symptoms referable to the delay in resolution. A few complained of slight shortness of breath on exertion and the slow return of strength and energy. Abnormal physical signs had usually disappeared, although there was still radiological evidence of disease. In three cases, however, rales persisted over the area for several months after the x-ray film had returned to normal. In two of these, bronchograms showed no evidence of dilatation of the bronchi. In a further two patients evidence suggesting pleural adhesions remained after the lung parenchyma had apparently returned to normal.

Empyema.—Seven cases of empyema occurred—one in a child of 12 months. Four were cured by the aspiration of purulent fluid and the instillation of penicillin into the pleural cavity. One required rib resection and drainage. Diagnosis was delayed until seven weeks after the onset of the illness in this case, and communication had by this time been established with a bronchus. The seventh showed evidence suggesting a small pleural effusion from which needling withdrew no fluid. Purulent sputum occurred later in the illness and was seen by bronchoscopy to be coming from the lower lobe bronchus. This case was possibly a lung abscess; the weight of evidence suggested an empyema.

Sterile Serous Effusion.—The five cases had all received treatment with one or other of the sulphonamides. Penicillin had also been given in two cases. The history of the illness suggested pneumonia in every case, and blood-stained sputum had been noted in the four adult patients but not in the one child. Specimens of fluid were obtained from four cases, and were in each instance sterile and straw-coloured. The fluid was clear in one and opalescent in three. All eventually resolved without leaving any evidence of disease. Three effusions were small and two of moderate size. From one case 30 oz. (850 ml.) of fluid

was withdrawn. This condition is quite common, and may be followed by the development of empyema.

Pulmonary Tuberculosis

Pulmonary tuberculosis was present in 32 cases. Three had been known to be suffering from this condition—one with positive and two with negative sputum. All three resolved normally, and were referred for fear of reactivation. Of the remaining 29 cases, four proved to have inactive and one active disease associated with pneumonia. Out of eight patients, therefore, only one was judged to be reactivated by the inflammatory complication, which occurred in two lobes affected by the proliferative form of tuberculosis. Baum and Amberson (1942) found pneumonia not uncommon in patients with pulmonary tuberculosis. Spread or reactivation of disease was likely only if the pneumonia was accompanied by suppurative disease or the exudative type of phthisis was present. Baum and Baum (1949) in a further investigation confirmed these findings and noted that reactivation was most probable in fibro-caseous tuberculosis and where the pneumonic process attacked a lobe containing such disease. Three of the above eight cases suffered from pneumonia of a lobe in which there was obvious radiological evidence of phthisis. Only one of these was of fibro-caseous type, and in this there was no change in the status of the primary condition.

Twenty-five cases were suffering from active pulmonary tuberculosis, including the one referred to above. Their symptoms were judged as being due to this condition in 24. In 21 of these the sputum was positive for tubercle bacilli. The varied nature of the symptoms of onset of phthisis is well known. Its insidiousness has been stressed to the depreciation of the more acute forms of onset. Rist and Ameuille (1922), Rist (1929), and Douglas, Pinner, and Wolepor (1929) have all drawn attention to the fact that many cases present with symptoms suggesting a pneumonic or influenzal process. They state that about 50% of cases are suffering from a pneumonic process of lobar or segmental distribution at the time of their first symptoms. About 25% present with symptoms of "pneumonia" and 25% with those of "influenza." More recently the same facts have been commented on by Toussaint and Pritchard (1944). Further support, but from a different angle, is given by Williams and Hill (1930). They analysed the diagnosis other than the correct one given to 1,199 patients suffering from pulmonary tuberculosis. Bronchopneumonia (12), pneumonia (56), pleurisy (165), and congestion of the lung (10) accounted for a total of 243 misdiagnosed cases. Thus nearly 25% had ostensibly suffered from symptoms suggesting the symptom-complex under discussion.

I am not of the opinion that the initial lesion in pulmonary tuberculosis is a pneumonic process of segmental or even broader distribution: the first symptoms of disease noticed by the patient are much more often those of acute illness than is generally appreciated. The insidious symptoms of cough, lassitude, and loss of weight will often on careful questioning be found to have been preceded by an acute episode. It has been said that phthisis progresses by means of a succession of pneumonias.

The symptom-complex that we are considering may be caused in a number of ways by pulmonary tuberculosis. In the 25 active cases found in this series an attempt has been made to decide what tuberculous process instigated the attack of seeming pneumonia. Twelve cases were associated with recent consolidation, either lobar or segmental

in extent, using the term "segmental" to describe one of the main broncho-pulmonary segments of less than lobar size. Eight were associated with recent spread, bronchopneumonic in type, in which evidence suggesting an older lesion was present. Two occurred at the time of collapse of a lobe. One was a case of typical acute tuberculous lobar pneumonia. One was brought to notice by an effusion complicating bilateral parenchymatous disease. One was a case of bilateral proliferative disease, which was probably reactivated by an atypical pneumonia, though it might possibly have been active and without symptoms previously.

Among the active cases there were five women, all under the age of 40, and 20 men, of whom 12 were over the age of 50. The age of the men should be specially noted, because there is a fairly widespread belief that phthisis with acute symptoms is uncommon in the older age groups. The single case of tuberculous pneumonia was in the youngest, a female aged 19. Of all the 48 children below the age of 15 none proved to have pulmonary tuberculosis, although it was frequently suspected by the medical attendant. This was to be expected, as primary tuberculosis, the only common form of the disease found in children, rarely presents with the symptoms under review.

Bronchiectasis

The 11 cases of bronchiectasis were found after the pneumonic process might be considered to have subsided. Eight were confirmed by bronchography. The other three cases presented radiographs typical of bronchiectasis six months or more after the acute attack. All had histories of past pneumonia and symptoms characteristic of bronchiectasis extending over many years. All were accompanied by abnormal physical signs.

Tuberculous Pleural Effusion

Six cases of pleural effusion, presumed to be tuberculous in origin, are included. None of the specimens taken from these cases disclosed tubercle bacilli either on direct examination or on culture. No special procedures such as described by Eberle (1949) were utilized to isolate tubercle bacilli. All the effusions were straw-coloured; four were clear and two opalescent. Nairn (1949) states that, apart from the demonstration of tubercle bacilli, it is impossible to decide the origin of a pleural effusion by laboratory methods. These cases were divided from the serous effusions of pneumonic origin on clinical grounds, special attention being paid to the history of onset of the illness, the presence of blood-stained sputum during the acute stage, and the response to sulphonamides.

Miscellaneous

New Growth.—In two of the four cases sudden collapse of an upper lobe was diagnosed as pneumonia. In one a pleural effusion was similarly mistaken, and the fourth presented as an abscess of the right upper lobe. The diagnosis was confirmed microscopically in each case, two specimens being obtained by biopsy during bronchoscopy and two at necropsy. All were dead within six months of their first attendance.

Lung Abscess.—No cause was found in the one case. It cleared quickly with penicillin and postural drainage.

Spontaneous Pneumothorax.—An incomplete pneumothorax—i.e., with adhesions—accompanying bronchitis and emphysema was found in one individual.

Cardiac.—Of the three cases one was suffering from a pulmonary infarct and auricular fibrillation, and one from

pulmonary oedema and congestive failure which had been preceded by pyrexia of unknown origin. The third was a case of pulmonary oedema accompanied by left ventricular failure and hyperpiesia.

Cough Fracture.—One case of cough fracture of the sixth right rib occurred in a woman six months pregnant who also had an atypical pneumonia of the left lower lobe. Attention has been drawn to this relatively common condition by Cohen (1949). No proved case of cough fracture on the right side has been reported previously in pregnancy. Furthermore, the condition has hitherto occurred during the last three months only (Pauley *et al.*, 1949).

Discussion

From this short analysis of 228 cases of "pneumonia" there would seem to be little doubt about the value of radiography as an extra aid to diagnosis. It is wiser to err on the side of safety by taking a radiograph which shows no abnormality than to procrastinate with the risk of disease progressing.

The figures justify the use of radiography in "pneumonia" if only as a method of diagnosing phthisis. This disease, so amenable to modern treatment in the early stages and so difficult to arrest when advanced, is commonly thought to have most frequently an insidious onset. That this opinion is erroneous cannot be too often repeated. Twenty-nine new cases were discovered. Twenty-five were active, and 21 of these had sputum which was positive on examination for tubercle bacilli at the time of their first radiograph. Thus 11% of the total proved to have active pulmonary tuberculosis. On excluding these 228 from the new cases referred to the chest clinic over this period it was found that all other methods of case-finding produced only seven cases of active reinfection tuberculosis per 100 new individuals examined. The two groups are not strictly similar, but the conditions favour the second group, which contains new cases referred already diagnosed and the positive results of serial contact examination.

The percentage of abnormality in this series is high, and it should be clearly understood that if every case presenting with the pneumonia symptom-complex was referred many more radiographs with normal shadows would be taken. In point of fact, 27 cases (21 adults and 6 children) were seen during this period complaining of the necessary symptoms, but their films showed no abnormality. However, if we are to strive for increased accuracy in diagnosis, with the object of recognizing disease in its earliest and hence most curable stage, the idea that every radiograph taken must show an abnormality should be abandoned. Where chest conditions are concerned this concept has already gained much ground, furthered by the success of mass radiography. Now that an attachment for photo-fluorography can be employed with any efficient modern radiographic unit at the cost of a few moments' adjustment, the problem of the time and expense of taking full-size films, except when a lesion is revealed, has been satisfactorily solved. It is to be hoped that most areas will in the future be able to take large numbers of miniature films. Until such facilities are universal the best possible use must be made of existing apparatus.

Summary

Analysis has been made of 228 consecutive cases referred with the symptom-complex of "pneumonia."

Forty-one patients were suffering from complications of pneumonia; they included 29 cases of delayed resolution, 7 of empyema, and 5 of sterile serous effusion.

Twenty-five active and 4 inactive cases of pulmonary tuberculosis were disclosed.

Twenty-seven further cases of disease were revealed. They included tuberculous effusion (6), bronchiectasis (11), new growth (4), lung abscess (1), spontaneous pneumothorax (1), cardiac (3), and cough fracture (1).

It has been argued that radiography should be widely applied to the symptom-complex of "pneumonia."

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ADRENAL CORTICAL TUMOURS OF UNUSUALLY LARGE SIZE

BY

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Tumours arising from the adrenal glands are rare, especially those primarily in the cortex. It is well known that cortical hyperplasia of either a focal or a generalized type occurs during middle life and is often associated with feminine pseudo-hermaphroditism (Glynn, 1912). Where the hypertrophy is generalized, a gland may enlarge and even approximate in size to the kidney. All gradations occur between simple hypertrophy and true adenoma formation, and as the two conditions appear during the same age period it is sometimes very difficult to differentiate one process from the other.

Primary malignant tumours arising from the glandular elements of the cortex are usually referred to as adenocarcinomata—a term which has largely replaced that of hypernephroma. As it was common to misapply the older term to renal tumours and non-cortical adrenal tumours it is obviously an advantage to abandon it, but since the adrenal cortex is developed from mesoderm it is clearly not entirely accurate to employ a title which indicates an epithelial origin. However, most pathologists agree that the histological appearances are of "adenocarcinomatous" type, and I shall use the term here.

In the same way as difficulty is encountered in drawing a sharp line between simple hyperplasia and true adenoma formation, so it is not always easy to differentiate histologically between benign and malignant conditions. Thus when metastases can be demonstrated the diagnosis is clear despite the fact that the primary tumour may be made up of cells apparently identical with those of a normal adrenal gland. Often, however, spread occurs late, and large tumours are encountered which undergo necrosis and extensive haemorrhage yet possess thick well-defined capsules.

Adrenal cortical tumours may be further subdivided into those which are associated with hormonal disturbances and those which are not. Examples of cases occurring without hormonal disturbances are well recognized but rare. The majority occur in adults over the age of 30 and have been described in both sexes. Cahill *et al.* (1942) found five such cases in a series of 13 adrenal cortical tumours. The histological appearances vary from those that are well differentiated to those showing an extreme degree of anaplasia.

The following two cases fall into the group of tumours of adrenal cortical origin without hormonal disturbances. In each case the clinical picture was that of a large abdominal mass causing minimal discomfort. In both cases the tumours were discovered on routine examination, when the patient had sought advice for other symptoms. Both were easily removable at operation.

Case 1

A man aged 69, under the care of Sir Stanford Cade, was first seen at Westminster Hospital on May 28, 1949, complaining of difficulty in micturition. Five months previously he had noticed a painless swelling in the right side of the abdomen.

Examination revealed a heavily built man with dyspnoea on exertion and a blood pressure of 240/120, but without clinical evidence of Cushing's syndrome. Prostatic enlargement was thought to account for his urinary symptoms. A very large, tense, immobile mass was present in the right side of his abdomen extending up to the xiphisternum and across the midline towards the left. The possibility of a large hydro-nephrosis was excluded because the excretion pyelograms showed normal kidney patterns.

At laparotomy on June 7 a large retroperitoneal tumour lying anterior to and above the right kidney was discovered. No adrenal gland could be found on that side. The tumour was encapsulated and stripped off the kidney with ease, leaving it normal, with no suggestion of its having any association with the mass. After operation the blood pressure fell to 120/80, and the patient seemed weak and collapsed. He developed a basal bronchopneumonia and died on June 13, six days after operation. Post-mortem examination was not allowed.

Case 2

A woman aged 57, under the care of Mr. G. T. Mullally, was first seen at Westminster Hospital on August 2, 1946, complaining of a painless swelling in the right upper abdomen which had been present for 3½ years. She had no symptoms apart from occasional abdominal colicky pains and a mild degree of constipation.

Examination showed that she was well nourished and of slight build, with a blood pressure of 130/80, and no clinical suggestion of any hormonal abnormality or of Cushing's syndrome. A hard rounded mass was palpable in the right upper quadrant of the abdomen. It was not attached to the skin, and moved down on respiration. A barium meal revealed displacement but no abnormality of the bowel. Excretion pyelograms showed normal renal shadows, and the blood urea was 34 mg. per 100 ml.

Laparotomy, performed by Mr. Mullally on August 18, revealed a large encapsulated retroperitoneal tumour lying slightly behind and to the right of the right kidney, but in no way associated with it. No adrenal gland could be found on the right side. The tumour was easily removable, but after operation the patient was collapsed, with depressed blood pressure of 80/40. Plasma and blood transfusion produced no improvement. On the fourth day a basal bronchopneumonia developed, and the patient died on the sixth day after operation. Post-mortem examination was not allowed.

Morbidity and Histology

The morbid anatomical and histological appearances of the tumours were so similar that they may be described together.