

DISSEMINATED FOCAL PNEUMONIA

BY

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(WITH SPECIAL PLATE)

Cases conforming to the classical descriptions of pneumonia comprise only a proportion of the total number of acute pulmonary infections. While lobar pneumonia has been studied extensively, and detailed experimental investigations have been made into the various bacteriological types of pneumonia, the atypical pneumonias which are of such importance to the clinician are as yet largely unclassified. It has been the observation of many that such cases are becoming relatively more numerous; this point is stressed in a recent study by Olmer *et al.* (1936). Allen (1936) has described a relatively benign form of pulmonary infection which he has studied radiologically and termed "acute pneumonitis." I wish to draw attention to some cases of acute or sub-acute pulmonary infection which seem to form a recognizable clinico-radiological group, important on account of the unusual and possibly prolonged course and the resemblance of the radiological changes to those of pulmonary tuberculosis.

Case I

A man aged 25, a carpet planner, was first taken ill on August 27, 1936, with malaise, frontal headache, backache, pain below the left clavicle, and two mild shivering attacks. He took to his bed; in two days he attempted to go back to work, but had to return home. He developed a slight cough, with scanty expectoration. He had had no serious illnesses previously, and his family history revealed nothing of note.

On admission to hospital on September 3 he was drowsy and flushed, and complained of frontal headache. Temperature 102.2° F., pulse 102, respirations 18. The tongue was furred and fauces injected. The chest showed some diminu-

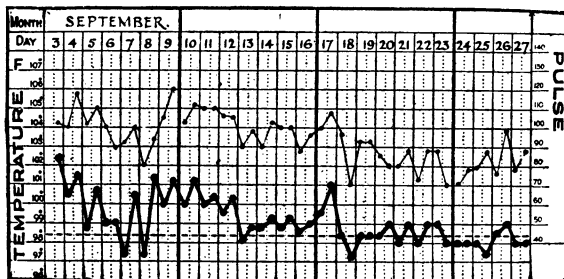


CHART 1.—Showing course of the pyrexia in Case I.

tion of movement on the left side, with impairment of percussion note over the upper half, especially anteriorly. Over this area a few medium rales were audible; the breath sounds were vesicular. Examination of other systems showed nothing abnormal. The course of the pyrexia is shown in Chart 1.

For the first few days prostration continued and there was much sweating; the respiration rate remained at or below 20 per minute until September 9, when it rose to 30 and then ranged between 20 and 30 for a week. A skiagram of the chest on September 8 (Plate, Figs. 1 and 2) showed extensive mottling in the upper and middle zones of the left lung, suggestive of tuberculous infiltration.

At this stage pulmonary tuberculosis was suspected and the advisability of pneumothorax treatment discussed, but it was decided to await bacteriological confirmation. The sputum, at first scanty and muco-purulent, gradually became more profuse and purulent, reaching a maximum of 120 c.cm. on

September 17. The pulmonary physical signs at the left upper zone extended somewhat at first, and generalized rhonchi were occasionally heard. Hoarseness of the voice was noted on September 6. Mr. J. I. Griffiths reported a simple laryngitis on September 14. By September 22 the temperature was settling; rales were still audible over the left lung, but the percussion note was less impaired. A skiagram on this date showed some resolution of the mottling. By October 5 there was very marked improvement; sputum was reduced to a trace. On account of some nasal obstruction the nasal sinuses were investigated; the left antrum was somewhat opaque, but on puncture only debris resulted. On October 9 a skiagram showed only slight relative want of translucency in the left upper and middle zones.

The patient was discharged on October 21 and was seen again a month later feeling quite well, the only residual symptom being cough with some mucoid expectoration.

LABORATORY EXAMINATIONS

The sputum was examined five times for tubercle bacilli with negative results. Mouse inoculation on September 4 failed to show pneumococci. Culture on September 23 gave a growth of *H. influenzae*, *Strep. viridans*, and *N. pharyngis*. A blood examination on admission showed a normal red-cell count, and 9,400 leucocytes per c.mm., of which 48 per cent. were polymorphs. The maximum leucocyte count recorded was 14,000 per c.mm. with 70 per cent. polymorphs on September 15. Agglutination tests for the typhoid group and *Brucella abortus* were negative on September 18.

Case II

A man aged 27, a motor assembly engineer, was taken ill on December 2, 1936, with malaise and shivery sensations, and had to return home from work. The next morning he felt better and went to work, but felt so weak with headache, cough, and feverishness that he went home again to bed. In the succeeding days he had a troublesome unproductive cough, excessive sweating day and night, some dyspnoea but no pain, and he vomited once. His previous health had been good, apart from an attack of pneumonia at the age of 8 years. His mother had died of pulmonary tuberculosis.

The patient was admitted to hospital on December 9; he was rather thin, looked ill and pale, sweated freely, but there

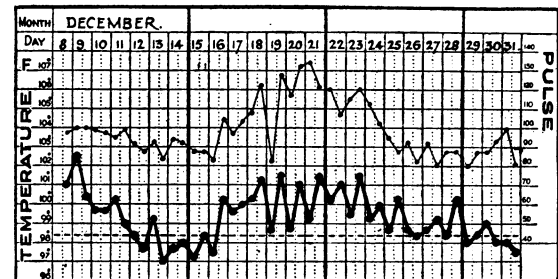


CHART 2.—Showing course of the pyrexia in Case II.

was no cyanosis. Temperature 101° F., pulse 98, respirations 28. There was slight faucial injection. The chest was moving less on the right side, and the percussion note was slightly impaired over the lower half of the right lung. The breath sounds were vesicular on the left side with a few rhonchi at the base; on the right they were weak, with many scattered rhonchi and medium rales below the angle of the scapula. Examination of other systems showed no abnormality. The course of the pyrexia is shown in Chart 2.

For the first few days after admission the temperature fell, though there was little change in the symptoms. Sweating was noted to be extraordinarily profuse. Small amounts of purulent sputum were produced, once slightly blood-stained. The rales on the right side extended upwards to below the clavicles.

A skiagram on December 10 (Figs. 3 and 4) showed widespread coarse mottling of the right lung, most dense in the

middle zone. Another, on December 15, showed some clearing in the upper and lower zones, the middle zone remaining as before. On December 16 the temperature started to rise again, though the respiration rate never exceeded 28 per minute. On December 21 there was some pain in the right renal area; no gross abnormality was found on chemical, microscopical, or bacteriological examination of the urine. The lung signs remained much the same on the right side; a few rales appeared at the left base. On December 22 another skiagram showed extension of the mottling in the right middle and lower zones.

About this time the cough became more productive, purulent sputum averaging about 180 c.cm. daily and reaching a maximum of 210 c.cm. on December 29. Improvement now started. On January 4, 1937, when he had been afebrile for three days, a skiagram (Fig. 5) showed much clearing. The cough and sputum gradually diminished. By January 17 there was a trace of sputum daily, but on examination numerous fine rales were heard over the whole of the right lung and at the left base; a skiagram showed no further change. He was discharged to a convalescent home on January 26. The patient was seen again on March 23, when he felt quite well apart from slight morning cough; a skiagram showed only a slight increase in the linear striations at the right lower zone.

LABORATORY EXAMINATIONS

The sputum was examined for tubercle bacilli thirteen times by direct examination and once by guinea-pig inoculation, with negative results. Culture yielded the following: December 10, *Strep. viridans*, micrococci, *H. para-influenzae*; December 11, *Strep. viridans*, *N. catarrhalis*, diphtheroids; December 12, *Strep. viridans*, micrococci, diphtheroids; January 13, *Strep. viridans*, micrococci, *H. para-influenzae*. On December 28 mouse inoculation failed to demonstrate pneumococci. A blood examination on December 9 showed a normal red-cell count and 12,000 leucocytes per c.mm., of which 79 per cent. were polymorphs; on December 18 the leucocyte count had risen to 28,400, with 96 per cent. polymorphs. The Wassermann reaction was negative.

Case III

A man aged 67, a boot salesman, was taken ill early in October, 1936, with slight frontal headache, malaise, nasal catarrh, anorexia, profuse sweating, constipation, and insomnia. He continued his normal activities for three weeks before he took to his bed. He was found to be febrile, and developed a slight dry cough. His previous health had been good, apart from a brief febrile illness diagnosed as "influenza" thirty years previously, which had left him with a moderate degree of deafness. His fingers had been clubbed all his life, and he said his father's fingers had been similarly affected; there seemed to be no symptoms of chronic intrathoracic disease to account for this finding.

On admission to hospital on November 11, 1936, he was found to be well nourished and of rather florid complexion, slightly dyspnoeic on exertion, but in no distress at rest. Temperature 98.9° F., pulse 88, respirations 24. The upper respiratory tract showed only slight injection of the fauces, with a middle-ear deafness. On examination of the chest there was a lower dorsal kyphosis with generally poor expansion; the breath sounds were vesicular throughout, and at both bases there were very numerous rales of mixed types, more on the right side. No abnormality was found in other systems.

For the first week in hospital the pyrexia was remittent to 99°-100° F. (Chart 3), and thereafter showed only an occasional slight evening rise above normal. On November 17 the pulmonary physical signs remained unchanged; a skiagram of the chest (Figs. 6 and 7) showed much coarse mottling of the middle and lower zones of both lungs, with a calcareous focus in the right lower zone. The cough became more productive, until by the beginning of December sputum amounted to 120 c.cm. daily. Further skiagrams on November 26 and December 12 showed little change in the

appearances. By December 23 an improvement in the general condition was noted; sputum was reduced to 15 to 30 c.cm. daily, and the rales at the bases were less numerous. A skiagram on December 31 showed a diminution of the mottling previously noted. He was discharged on January 1, 1937.

The patient was seen again on January 22, now free of cough and feeling well. Examination showed a few rales

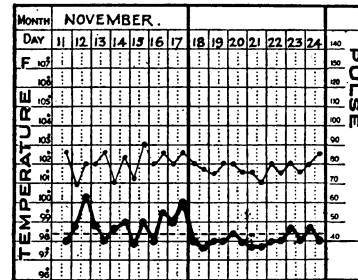


CHART 3.—Showing course of the pyrexia in Case III.

after cough only at the right base, and a skiagram (Fig. 8) showed practically complete clearing. A lipiodol examination on February 11 outlined the branches of both descending bronchi without showing any evidence of dilatation.

LABORATORY EXAMINATION

The sputum was examined three times for acid-fast bacilli with negative results; culture on two occasions, on December 3 and December 5, yielded *N. catarrhalis*, *Strep. viridans*, micrococci, and diphtheroids; anaerobic culture failed to demonstrate actinomycetes. A blood examination on November 12 showed a normal red-cell count and 11,000 leucocytes per c.mm., of which 77 per cent. were polymorphs. On November 13 blood culture was sterile, and agglutination tests for the typhoid group and *Brucella abortus* were negative. The blood Wassermann reaction was also negative.

In the fourth case the clinical picture was obscured by other morbid processes, the patient coming under observation first on account of rheumatoid arthritis and eventually dying of polio-encephalitis. However, this provided an opportunity of correlating radiological with necropsy findings.

Case IV

A man aged 29, a drain fixer, was first admitted to hospital on July 11, 1936, on account of an arthritis of rheumatoid type, which had started in January, 1935, in the hands and subsequently affected the shoulders, elbows, and knees. At this time there were no respiratory symptoms or signs and no fever; and apart from the joints the only abnormality was a chronic tonsillitis. The blood Wassermann reaction was negative, and the blood count normal as regards both red and white cells. He was discharged on July 22, to return for tonsillectomy.

He was readmitted on August 22. The arthritis was worse. A few days after discharge from hospital he had developed a cough, accompanied by scanty expectoration, increasing dyspnoea, and a feeling of tightness in the chest. On examination the chest was symmetrical but showed generally poor movement; persistent medium rales were heard at the right base. The temperature chart for three weeks showed an occasional evening rise to 99° F., and then was normal. The pulmonary physical signs increased until at the beginning of September there was slight impairment of the percussion note at both bases, the right more than the left, and numerous crepitant rales at both bases, with normal vesicular breath sounds. A skiagram on August 29 showed a diffuse somewhat mottled opacity at both lower zones (Fig. 9), and another on September 5 showed no change. By September 19 the physical signs had cleared; and a skiagram showed both lower zones to be more translucent, but with some evidence of increase in fibrous tissue. On September 30 tonsillectomy was performed,

with normal recovery. On October 7 a lipiodol examination showed no gross abnormality; there was slight cylindrical dilatation of the posterior branches of the left descending bronchus.

Though the general condition was still far from satisfactory he was discharged from hospital on October 9 at his own request.

LABORATORY EXAMINATIONS

The sputum was examined for acid-fast bacilli five times, with negative results. On August 26 culture yielded *Strep. viridans*, *Strep. non-haemolyticus*, *N. pharyngis*, and *M. tetragenus*. A blood examination on August 24 showed 6,000 leucocytes per c.mm., with a normal differential count.

On November 12 he was admitted to St. Charles' Hospital on account of vomiting, dysphagia, and loss of weight, of ten days' duration. A laryngeal palsy developed, dysphagia was progressive, and it became clear that these symptoms were due to a lesion of the central nervous system. A skiagram of the chest taken on November 16 showed changes similar to those in Fig. 9, but somewhat obscured by lipiodol residues.

He died on November 28. A necropsy was carried out by Dr. A. B. Bratton. The immediate cause of death was a bulbar encephalitis, probably polio-encephalitis, with perivascular "cuffing," focal degeneration of nerve cells, and small areas of softening and of haemorrhage in the medulla, pons, and mid-brain. The changes in the lungs were described as follows:

"On removal the lungs were unusually firm, somewhat suggesting red induration, and there was consolidation at the right base. On microscopical examination a section from the right lower lobe shows an ill-defined area of organizing pneumonia; in the rest of the section there is chronic interstitial inflammation and slight fibrosis of the alveolar walls, and oedema and recent haemorrhage in the alveoli. A section of another part of the lungs shows oedema and congestion, and a focal but widespread distribution of slight fibrosis and slight chronic inflammatory infiltration of the alveolar walls. There was no evidence of tuberculosis."

Nature of the Pulmonary Lesion

The clinical and radiological evidence suggests that the pulmonary lesion in these cases was essentially a pneumonia in small foci disseminated through lobes or parts of lobes of the lungs, and liable to enter on a phase of delayed resolution. The pathological evidence in Case IV—"focal but widespread distribution of slight fibrosis and slight chronic inflammatory infiltration of the alveolar walls"—lends support to this view. This pathological picture has distinct affinities with that observed in three more chronic cases which terminated fatally, recently reported (Scadding, 1936). In these a pulmonary infection of subacute or chronic course closely simulated pulmonary tuberculosis, both clinically and radiologically: at necropsy the chief finding was a simple pneumonia in diffuse foci showing recent consolidation, resolution, organization, and suppuration. The lesions in the two series seem essentially similar, those of the present series undergoing resolution at an earlier stage and showing less tendency to progress to the more chronic phase of organization and fibrosis.

Thus there arises the concept of a process characterized by pneumonic consolidation in small scattered foci; the individual foci at any time may be of different ages and at different stages of evolution towards resolution, organization, or suppuration. They may clear almost completely or may leave more or less residual fibrosis. The process shows little of the tendency to a clear-cut termination seen in the more usual types of pneumonia, and may enter a subacute or chronic phase. Clearly, if a case presenting this picture comes to necropsy there

will be little that is striking to the pathologist except the focal distribution of the lesions; the main interest of the picture is clinical. As a clinically convenient term, not involving any aetiological assumptions, I propose to describe the condition as "disseminated focal pneumonia."

Clinical Picture of Disseminated Focal Pneumonia

The symptoms differed clinically from those of other forms of pneumonia in several important respects. The onset was not sudden as in lobar pneumonia; and there was no evidence of a previous descending respiratory infection as in some of the commoner forms of bronchopneumonia. The initial symptoms were mostly constitutional—malaise, headache, sweating, and shivery sensations short of an actual rigor. While there was some dyspnoea there was no respiratory distress at rest. Pain in the chest was not a prominent symptom; it was entirely absent in two cases, and in the other two was not of typical pleuritic type. Cough at the onset was dry. The course was subacute or chronic, and fever variable, not sustained, terminating by an indefinite lysis, and in the more chronic cases amounting only to an inconstant evening rise. Sweating became a prominent symptom. The cough, at first dry, subsequently became productive of increasing amounts of purulent sputum, reaching a maximum after several weeks, and continuing thereafter according to the progress of the case. Deferescence occurred in the fourth or fifth week in the two more febrile cases in which the whole course was observed, and symptoms, especially cough and sputum, continued for another week or two. In the two less acutely febrile cases symptoms continued for a longer time after the temperature was normal. If the cases in my previous series be accepted as belonging to the same category the possibility of a chronic progressive course must be recognized.

The physical signs were most evident over the upper lobes in two cases and over the lower lobes in two. They consisted of moderate impairment of percussion note, weak breath sounds, and numerous fine to medium rales. No definite consolidation signs were detected.

Radiologically the picture consisted of areas of diffuse rather coarse mottling, in foci varying from about 2 to 5 mm. in diameter. These changes were confined to the left upper lobe in one case and affected parts of more than one lobe in the rest. Resolution was slow in all but one case; in one it was not complete for at least twelve weeks from the onset. The resemblance of the infiltration to that of tuberculosis was at times striking.

Aetiology

The most remarkable feature of the bacteriology of the sputum in these four cases was the absence of organisms usually associated with pneumonia: in two the result of culture was confirmed by a negative result from mouse inoculation. Only organisms which might be found in any respiratory tract were isolated: *Strep. viridans*, *N. catarrhalis*, micrococci, and diphtheroids, and in one case each *H. influenzae* and *H. para-influenzae*. In no instance was there evidence of a fungus infection, and the presence of tubercle bacilli was excluded by repeated direct examination of the sputum, and in one case by guinea-pig inoculation.

The question of an influenzal aetiology arises; but there was no epidemic prevalent at the time of onset of any of these cases, nor was there any illness among contacts; and when an epidemic of proved virus influenza

occurred and a study of the lung changes was made (Scadding, 1937) nothing comparable with these cases was observed.

There was no undue incidence of previous respiratory illness in these cases; two at least of them occurred in young men who had been entirely free from such troubles. The aetiology thus remains obscure.

Discussion

Appearances attributed to bronchopneumonia in "miliary" foci have been described by numerous radiologists (Wessler and Jaches, 1923; Santé, 1930). In a few instances only has confirmation of the simple pneumonic nature of these shadows been obtained by necropsy (Assmann, 1934; Oberndorfer, 1928; Peschel, 1930). A "miliary bronchopneumonic" type of influenzal pneumonia has been described (Liebmann and Schintz, 1921; Eimer and Kestermann, 1931). The chief point of discussion in most of the reports in the literature has been the radiological diagnosis from pulmonary tuberculosis; but in a few the clinical picture is presented in sufficient detail to enable it to be compared with that of the present series. Cases recorded by Blechschmidt *et al.* (1926), Münchbach (1929), and Thums (1931) have in common with the present series a similar radiological picture, a gradual onset with predominantly constitutional symptoms, and a prolonged course with eventual complete resolution.

In the earlier stages there may be a great similarity between the clinical picture of disseminated focal pneumonia and that of pulmonary tuberculosis of recent onset. The course of the disease will settle the diagnosis in most instances without difficulty; but now that early collapse therapy is widely advocated it may be considered inadvisable to adopt a purely expectant policy where radiological evidence suggests a diagnosis of pulmonary tuberculosis. Certain clinical points may be helpful in differential diagnosis. The relation of the pyrexia to physical exertion which is usually so definite in cases of pulmonary tuberculosis is not seen in these cases; rest in bed does not produce that fall in the level of pyrexia which is so constant in tuberculosis. A most valuable point in the diagnosis is the increasing amount of purulent sputum within a few weeks from the onset; this relatively sudden increase would not be expected in a case of tuberculosis in the absence of gross cavitation, and the continued absence of tubercle bacilli from this purulent sputum should clinch the diagnosis.

The existence of the syndrome here presented calls for caution in the application of collapse therapy in cases in which pulmonary tuberculosis of acute onset is suspected on radiological grounds without confirmation from bacteriological examination.

Summary

1. Four cases of pneumonia of unusual type are reported. Clinically, the chief features were a relatively gradual onset with predominantly constitutional symptoms; a prolonged course; a gradual increase in the expectoration, scanty at first, until about the third week, when profuse purulent sputum was being produced; and an absence of signs of frank consolidation. Radiologically, a coarse scattered mottling affecting large areas of one or both lungs was seen.

2. The aetiology is uncertain, the organisms usually associated with pneumonia not being found on repeated bacteriological examinations of the sputa.

3. The lesion appeared to be a pneumonia in small scattered foci, with a tendency to irregularly delayed resolution.

4. Such cases form a recognizable group, for which the name "disseminated focal pneumonia" is suggested.

5. The differential diagnosis from some forms of acute pulmonary tuberculosis, which may be difficult in the early stages, is discussed.

I am indebted to my colleagues of the department of medicine, British Postgraduate Medical School, for allowing me to study cases which were under their care; to Dr. J. Duncan White for the skiagrams; to Dr. A. B. Bratton for the necropsy report on Case IV; and to the Chief Medical Officer, L.C.C., for permission to publish the case reports.

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VARIX OF THE NECK

BY

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(WITH SPECIAL PLATE)

The occurrence of a case of this rare condition, which in the current textbooks on surgery is either not mentioned or is merely recorded in a somewhat doubting fashion, prompted me to search the literature for further references.

Among the first to describe the condition was William Hey (1814), who was consulted about a child aged 4 months suffering from a tumour in the left side of the neck just above the clavicle. It was the size of a pigeon's egg, bluish in appearance, soft, and painless on palpation. The tumour seemed more tense when the child cried. He thought that the swelling arose from the external jugular vein. On puncture, fluid blood was withdrawn. The condition was eventually cured by repeated aspirations. Liston (1847) and Holmes (1860) also describe varieties of sanguineous cysts of the neck. These cysts are usually single, lying in the subcutaneous tissue, and contain liquid venous blood. They swell when the circulation is excited and are easily compressible. Another case, that of a boy aged 11, is reported by Richardson (1869). A pendulous tumour extending over the clavicle was present on the right side. It was first noticed at the age of 2. The skin over the swelling was bluish. On palpation the tumour felt uneven, as if lobulated; it was painless, and fluctuation was distinct. There was no pulsation, and it was irreducible. On exploratory puncture dark fluid blood was obtained. Something like a hard obliterated vein was to be felt in the deepest part of the empty cyst. The

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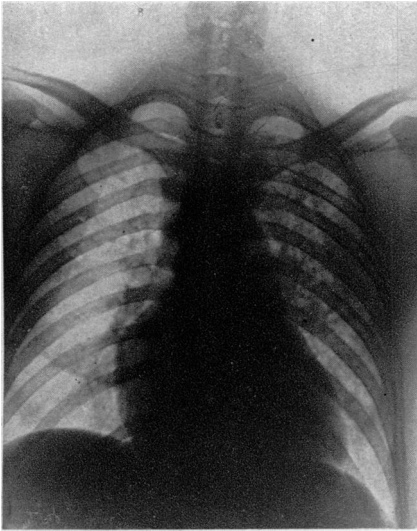


FIG. 1.—Case I; September 8, 1936.



FIG. 2.—Case I; Detail of mottling in left lung, September 8, 1936.

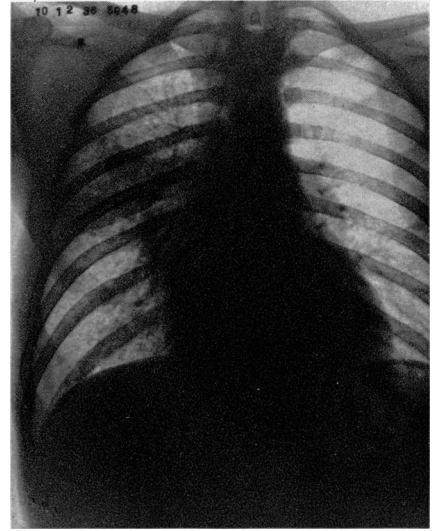


FIG. 3.—Case II; December 10, 1936.

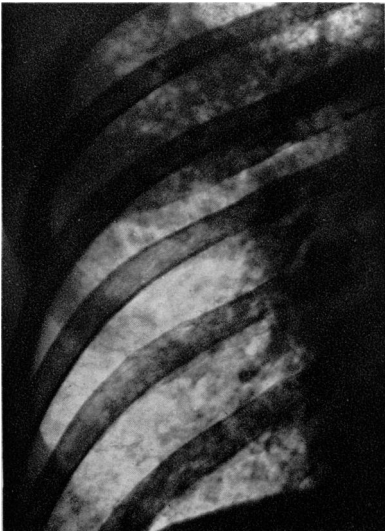


FIG. 4.—Case II; Detail of mottling in right lung, December 10, 1936.

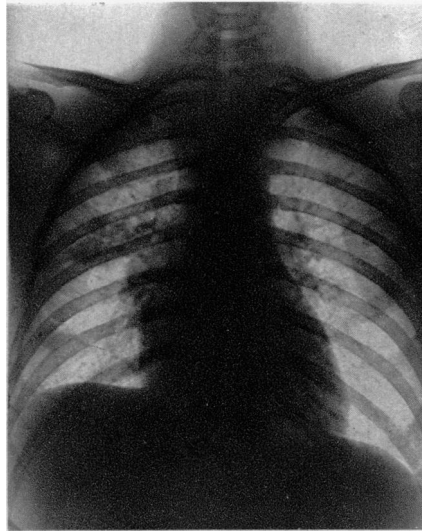


FIG. 5.—Case II; January 4, 1937.

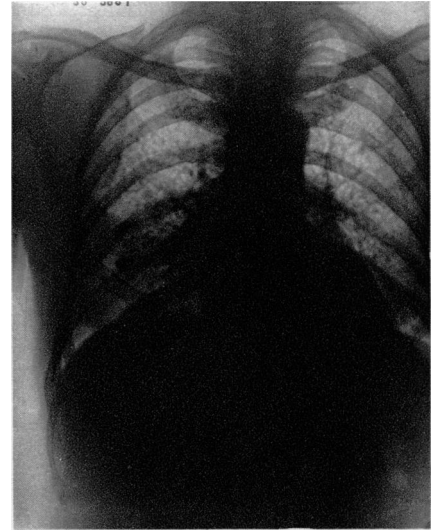


FIG. 6.—Case III; November 17, 1936.

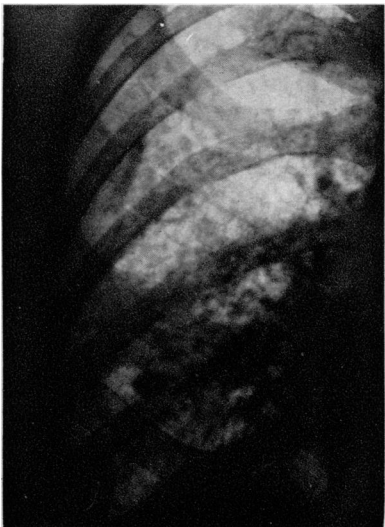


FIG. 7.—Case III; Detail of mottling in right lung, November 17, 1936.

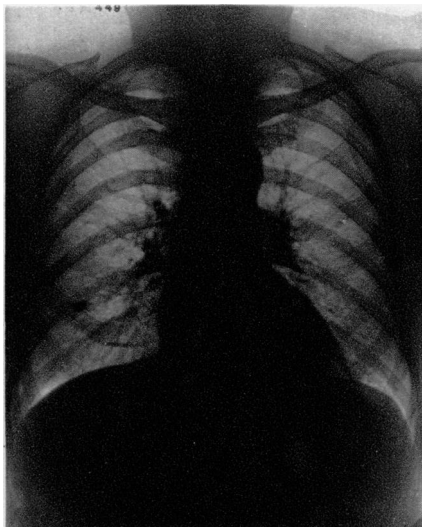


FIG. 8.—Case III; January 22, 1937.

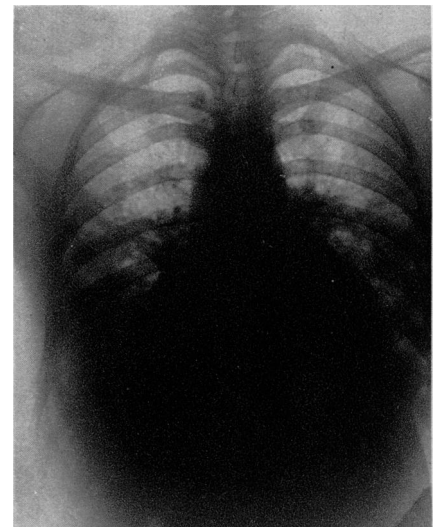


FIG. 9.—Case IV; August 29, 1936.