TRANSITORY PULMONARY INFILTRATIONS MISTAKEN FOR TUBERCULOSIS, WITH A REPORT OF FIVE CASES

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For some time the chest roentgenogram has been the most valuable diagnostic measure in the recognition of pulmonary tuberculosis. It has been shown repeatedly that physical examination of the chest as the only procedure in the diagnosis of pulmonary diseases is entirely inadequate. Spellman * gives an illuminating exposition of this fact in a recent article relating the experience of attempting, by physical examination, to detect pulmonary tuberculosis in army recruits in 1917-1918. It is not the purpose of the present authors, therefore, to minimize the efficacy of the roentgenogram in the diagnosis of pulmonary tuberculosis.

Five patients are presented, whose chest roentgenograms showed densities strikingly simulating tuberculous infiltrations which, however, proved to be non-tuberculous. In each of the five cases a diagnosis of pulmonary tuberculosis was originally made by one or more competent roentgenologists or phthisiologists. From the data available at the time the five patients were first observed the diagnoses were not questioned by the present writers. However, doubt was cast on the original diagnoses when examination of the sputum and aspirated gastric contents with direct smears, concentrations, cultures or guinea pig inoculations failed to disclose the presence of tubercle bacilli. Subsequent serial roentgenograms confirmed the non-tuberculous etiology of the pulmonary infiltrations.

To venture a diagnosis on a single roentgenogram of a patient's chest frequently leads to error. The demonstration of tubercle bacilli in the sputum should be the criterion in the final diagnosis of broncho-pulmonary tuberculosis. Probably in almost 100 per cent of the cases of active pulmonary tuberculosis tubercle bacilli can be found, if sufficiently thorough searches are made. If tubercle bacilli are absent, it is a safe rule to consider the pulmonary pathologic changes non-tuberculous in nature and to proceed with the various special examinations, such as bronchoscopy, etc., in order to arrive at a diagnosis.

With the universal use of artificial pneumothorax therapy in pulmonary tuberculosis the above remarks are pertinent. The value of this form of therapy in pulmonary tuberculosis is established beyond any doubt, but it may be unnecessary or even harmful in other pulmonary diseases. In the zeal for rehabilitating the tuberculous individual patient it is wise to establish first whether the patient has tuberculosis.

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Case Reports

Case 1. S. S., male, aged 51 years, was admitted to the Workmen’s Circle Sanatorium on May 24, 1939. For the past 15 years he had been the owner of a confectionery store. Prior to that time he had worked as a tailor. He did not recall any childhood illnesses. He had had pneumonia 18 years previously and a tonsillectomy 15 years previously. At intervals, for many years, the patient had had attacks of moderate dyspnea which he attributed to asthma. These episodes did not inconvenience him very much and he did nothing about them. The patient’s story of the onset and symptoms of his present illness was also rather vague and indefinite. About six weeks prior to his admission to the Sanatorium he began to feel weak, lose appetite and weight, and he began to have pain over the left side of his chest. He visited a physician who referred him for a roentgenogram of his chest. A diagnosis of pulmonary tuberculosis was made, and he was advised to enter a sanatorium.

The noteworthy findings on the patient’s admission to the sanatorium were poor nutrition, pale, dry skin, pale nasal mucosa, enlarged right tonsil, and slight congestion of vocal cords. On physical examination the heart did not show any enlargement;
rate was 108 per minute; rhythm was regular; sounds were of good quality; no murmurs were heard; the second pulmonic sound was accentuated. Blood pressure was 90 mm. Hg systolic and 62 mm. diastolic. Physical examination of the lungs showed dullness, bronchovesicular breathing, and medium moist rales over the right upper lobe anteriorly and posteriorly. Sibilant and sonorous rales were heard over the entire left lung anteriorly and posteriorly with bronchovesicular breathing over the upper lobe and dullness over the base. There was cyanosis of the finger nails and feet. Both legs showed marked varicosities.

Laboratory Data. May 25, 1939. Urinalysis was negative. The blood count showed: hemoglobin, 86 per cent; red blood cells, 4,460,000 per cu. mm.; white blood cells, 19,300 with polymorphonuclears, 43 per cent; lymphocytes, 48 per cent and eosinophiles, 9 per cent. Erythrocyte sedimentation rate, 54 mm. in one hour; Kahn reaction negative; non-protein nitrogen, 28.5 mg. in 100 c.c. of blood. On August 14, 1939, the hemoglobin was 92 per cent; red blood cells, 4,740,000; white blood cells, 17,450 with polymorphonuclears, 74 per cent; lymphocytes, 20 per cent; monocytes, 1 per cent and eosinophiles, 5 per cent. The erythrocyte sedimentation rate was 5 mm.
in one hour. Seven sputum examinations, including four of concentrated sputum, and culture did not show the presence of tubercle bacilli. Vital capacity (May 25, 1939) 1500 c.c. An electrocardiogram taken on May 24, 1939, showed an auricular and ventricular rate of 110 and right axis deviation, otherwise within normal limits. The electrocardiogram was repeated on June 19, 1939, following the administration of
digitalis, and it showed a depression of the R–T segments in Leads II and III; otherwise it showed no change from the previous electrocardiogram. Another electrocardiogram taken on August 17, 1939, showed an auricular and ventricular rate of 90, and it was otherwise unchanged from the first electrocardiogram, taken on May 25, 1939.

Roentgenograms. On May 24, 1939, a chest roentgenogram (figure 1) of this patient showed dense infiltrations throughout the left lung and upper two-thirds of the right lung. The cardiac silhouette showed moderate enlargement particularly to the
left. Fluoroscopic examination of the heart revealed slight enlargement of the left ventricle and more marked enlargement of the right ventricle. On June 13, 1939, the roentgenogram showed marked clearing of both lung fields; there was no change in size or configuration of the cardiac silhouette. On July 5, 1939, the roentgenogram (figure 2) showed complete clearing of the right lung field and remaining slight infiltration in the left upper lobe. The cardiac silhouette remained enlarged with straightening of the left border. On August 5, 1939, the chest roentgenogram was within normal limits except for evidence of emphysema. The straightening of the left border of the cardiac silhouette was not as marked as in the previous film. The last roentgenogram (figure 3), on September 5, 1939, showed no change in the lung fields from the film taken on August 5, 1939. The cardiac silhouette had returned to normal in size and configuration.

Course. On admission to the Sanatorium the patient was moderately dyspneic. There was also cyanosis of the finger nails and feet. That of the latter might have been due, in part, to the varicosities of both legs. Digitalis was administered, but was discontinued owing to its apparent lack of effect on the heart rate and the dyspnea. After about six weeks' stay in the Sanatorium the dyspnea and cyanosis began to subside, and prior to discharge the patient had no greater amount of dyspnea than would be expected in any individual with moderate emphysema. The cyanosis had completely disappeared. The patient ran an afebrile course and gained 13 pounds in weight. During his entire stay in the sanatorium the amount of cough and expectoration was negligible. The patient was discharged on September 17, 1939, and he returned to his usual activities.

Comment. In this case the original diagnosis of pulmonary tuberculosis was based essentially on the roentgen findings. Subsequent observation proved that the diagnosis was incorrect. In attempting to arrive at a correct diagnosis left-sided heart failure with one or a combination of the following common complications was considered; namely, pulmonary engorgement, pulmonary edema, pulmonary infarction and bronchopneumonia. However, the visualization, on fluoroscopic examination, of relatively more pronounced enlargement of the right ventricle, the accentuation of the second pulmonic sound, and the evidence of right axis deviation on the electrocardiogram, all pointed essentially to a right ventricular strain. Evidence was also lacking of the presence of hypertension, coronary arteriosclerosis, and mitral or aortic valvular disease, which tended to confirm the impression that the clinical picture was one of cor pulmonale. Apparently, the pulmonary manifestations were not the result of left ventricular insufficiency but rather due to the fact that the pathologic changes in the lungs produced increased resistance in the pulmonary circuit, with consequent hypertension in the pulmonary artery, followed by dilatation and possible hypertrophy of the right ventricle. The nature of the pulmonary infiltrations will be discussed later.

Case 2. F. K., female, aged 26 years, a school teacher, was admitted to the Workmen's Circle Sanatorium on November 2, 1937, during the fourth month of her first pregnancy. In childhood she had whooping cough, measles, chicken pox and influenza. Two weeks prior to admission she was taken acutely ill with fever and cough productive of about two drams of yellowish sputum in 24 hours. She was seen by two phthisiologists who diagnosed pulmonary tuberculosis and advised immediate admission to a sanatorium and induction of artificial pneumothorax. Interruption of the pregnancy was considered but not carried out.
The noteworthy physical findings on the patient's admission to the sanatorium were mild anemia of finger nails and eyelids, obvious symmetrical enlargement of thyroid, palpable but not markedly enlarged submaxillary glands, slight malar flush, and moist skin. The pharynx was slightly congested, and the anterior pillars and epiglottis were injected. The heart was entirely negative. Blood pressure was 94 mm. Hg systolic and 68 mm. diastolic. The abdomen was slightly protuberant; the uterus was enlarged midway between the symphysis and umbilicus. The lungs showed bronchovesicular breathing over the right upper lobe anteriorly, dullness over the right upper lobe posteriorly, distant bronchial breathing, and medium moist râles from the right angle of the scapula to the base.

*Laboratory Data.* November 3, 1937. Urinalysis negative. The blood count showed: hemoglobin, 70 per cent; red blood cells, 4,000,000 per cu. mm.; white blood cells, 10,200 with polymorphonuclears, 73 per cent; lymphocytes, 22 per cent and monocytes, 5 per cent. Erythrocyte sedimentation rate, 59 mm. in 60 minutes. Kahn test was negative. On November 21, 1937, the blood count was as follows: hemoglobin, 68 per cent; red blood cells, 3,950,000; white blood cells, 8,000 with polymorphonuclears, 65 per cent; lymphocytes, 30 per cent; monocytes 2 per cent and

![Fig. 4. (Case 2.) Roentgenogram taken October 28, 1937. Infiltration in the right infraclavicular region with bronchogenic spread to the right base.](http://annals.org/)
eosinophiles, 3 per cent. Erythrocyte sedimentation rate, 36 mm. in 60 minutes. Five sputum examinations, including three of concentrated sputum, and one culture did not show the presence of tubercle bacilli.

Roentgenograms. A chest roentgenogram (figure 4), taken on October 28, 1937 (prior to admission), showed infiltration in the right infraclavicular region with bronchogenic spread to the base. The left lung was negative. The roentgenogram taken on November 3, 1937, on admission to the sanatorium, showed no change from

![Roentgenogram taken November 13, 1937. Marked clearing of the right lung field.](image)

the previous film. On November 13, 1937, a roentgenogram (figure 5) showed marked clearing of the right lung field so that only accentuation of the lung markings remained. The left lung was negative. A roentgenogram taken on November 20, 1937, showed no evidence of any abnormal changes in either lung.

Course. During the patient's stay in the sanatorium she ran an afebrile course and gained two pounds in weight. The productive cough subsided, and prior to discharge, disappeared entirely. She was discharged from the sanatorium on November 21, 1937. At term she had an uneventful delivery. To date she has shown no evidence of having any active pulmonary tuberculosis.
Comment. This is another illustration of a mistaken diagnosis of tuberculosis based on the roentgenogram. The original diagnosis was disproved by serial roentgenograms, which showed the rapidity with which resolution of the pulmonary infiltration took place, and the failure to find tubercle bacilli in the sputum. This patient had a non-tuberculous bronchopneumonia resembling in many respects the type described by Reimann and Havens. The causative agent is thought to be a filtrable virus. Unfortunately, typing of the sputum was omitted at the onset of the illness prior to admission to the sanatorium.

Case 3. E. P., male, aged 23 years, clerical worker, was seen by one of the present writers (A. A. K.) on July 23, 1933. In childhood he had had measles. On July 22, 1933, the patient developed what he termed a "cold" accompanied by an unproductive cough. He felt somewhat feverish but did not take his temperature, and he did not feel sufficiently ill to go to bed. When the patient appeared for examination the
following day he had a temperature of 102.4° F. His only other complaint was that of cough, which had become somewhat productive of yellowish sputum.

The significant findings on examination were congestion of the pharynx and epiglottis. The lungs and heart were entirely negative, and the blood pressure was 120 mm. Hg systolic and 80 mm. diastolic. There were no other noteworthy physical findings.

Laboratory Data. July 24, 1933. Urinalysis negative. The blood count showed: hemoglobin, 90 per cent; red blood cells, 4,600,000 per cu. mm.; white blood cells, 8,700 with polymorphonuclears, 76 per cent; lymphocytes, 22 per cent; monocytes, 1 per cent and eosinophiles, 1 per cent. Erythrocyte sedimentation rate, 36 mm. in 60 minutes. Wassermann reaction was negative. Eight sputum examinations and inoculation of guinea pigs with two sputum specimens, collected on different days, did not show the presence of tubercle bacilli.

Roentgenograms. A chest roentgenogram (figure 6), taken on July 23, 1933, showed infiltration in the right lung between the fourth and fifth ribs anteriorly. The remainder of the right lung and the left lung showed accentuation of the lung markings. On July 27, 1933, the chest roentgenogram showed almost complete clearing of the infiltration in the right lung field. The accentuation of the lung markings in both lungs was still present. On August 3, 1933, the roentgenogram showed complete clearing of the infiltration in the right lung field. Some accentuation of the lung markings in both lungs was still evident. On August 10, 1933, the roentgenogram (figure 7) showed no abnormal changes.

Course. Four days after the onset of symptoms the patient's temperature returned to normal. The productive cough disappeared in a week. He was kept in bed about three weeks. After three months, when it was definitely determined that the inoculated guinea pigs did not show any evidence of tuberculous infection, the patient was allowed to return to his usual activities of life. This patient has been observed from 1933 until the present time; chest roentgenograms have been taken at least once yearly. To date there has been no evidence of any active pulmonary tuberculosis.

Comment. Following the first roentgenogram this patient's case was reviewed by a group of phthisiologists at a tuberculosis sanatorium conference. The diagnosis of pulmonary tuberculosis was not questioned and induction of an immediate pneumothorax was recommended. As in the previous case, the diagnosis was non-tuberculous bronchopneumonia probably caused by a filtrable virus. Since the episode occurred during the month of July it seemed rather remote, during the first few days of the patient's illness, to identify the clinical picture with that of epidemic influenza bronchopneumonia. The serial roentgenograms pointed to the non-tuberculous nature of the pulmonary infiltrations. The absence of tubercle bacilli confirmed that impression. It would have been of interest to have had this patient's sputum typed. Unfortunately it was not done.

Case 4. I. R., male, aged 48, a dress manufacturer, was admitted to the Workmen's Circle Sanatorium on July 15, 1940. In childhood he had had an appendectomy and in 1918 he had had the "flu." He did not recall any other specific illnesses in the past. For a number of years the patient had had a productive morning cough which he attributed to smoking. In May 1940 his cough became more marked. At about the same time he lost his appetite and began to lose weight and strength. He also began to have night sweats. The patient consulted a physician; a chest roentgeno-
gram was taken, and a diagnosis of tuberculosis was made. Immediate admission to a sanatorium and induction of artificial pneumothorax were advised.

The significant physical findings on admission to the sanatorium were moderate congestion of the pharynx, deviation of the nasal septum to the right with beginning atrophy of the mucosa, markedly retracted and thickened right ear drum, and slightly retracted left ear drum. The lungs and heart were entirely negative. Blood pres-

![Fig. 7. (Case 3.) Roentgenogram taken August 10, 1933. Complete clearing of the infiltration in the right lung.](http://annals.org/)

sure was 106 mm. Hg systolic and 70 mm. diastolic. Except for a linear scar over the abdomen, at McBurney's point, the remainder of the physical examination showed nothing noteworthy.

**Laboratory Data.** July 17, 1940. Urinalysis negative. The blood count showed: hemoglobin, 90 per cent; red blood cells, 4,560,000 per cu. mm.; white blood cells, 10,700 with polymorphonuclears, 43 per cent; lymphocytes, 55 per cent; monocytes, 1 per cent and eosinophiles, 1 per cent. Erythrocyte sedimentation rate, 12 mm. in 60 minutes. Kahn test was negative. Non-protein nitrogen 30 mg. in 100 c.c. of blood.
Six sputum examinations, including three of concentrated sputum, and one culture did not reveal the presence of tubercle bacilli. The vital capacity was 3200 c.c. An electrocardiogram showed low voltage of the Q R S complexes in all three leads, an isoelectric $T_3$, and left axis deviation.

Roentgenograms. A chest roentgenogram (figure 8), taken on July 2, 1940 (prior to admission), showed infiltration in the right upper lobe with an area of rarefaction suggestive of cavitation at the level of the second anterior rib. The left lung was negative. The roentgenogram taken on admission to the sanatorium, on July 13, 1940, showed infiltration in the right second interspace external to the hilus region. There was no evidence of rarefaction, and the left lung was negative. A roentgenogram (figure 9), taken on August 20, 1940, showed almost complete clearing of the infiltration in the right lung, leaving a few fibrotic strands external to the hilus region. A roentgenogram taken on September 12, 1940, showed no change from the one taken on August 20, 1940.

Course. During the patient's stay in the sanatorium he ran an afebrile course and gained 18 pounds in weight. Except for a morning cough, productive of about...
15 c.c. of mucopurulent sputum, he was symptomless. An attempt was made to obtain a bronchogram following lipiodol instillation. The bronchogram did not show any evidence of bronchiectasis. However, the bronchogram could not be considered conclusive because lack of cooperation on the part of the patient resulted in poor filling of the bronchial tree. Bronchoscopic examination was recommended but the patient refused to have that procedure performed because he claimed that he felt well and required no further treatment. He left the sanatorium against medical advice on September 13, 1940.

Comment. It is obvious that the infiltration in this patient’s right lung was not tuberculous in origin. Although conclusive evidence is lacking, it is felt that this patient had had a bronchial infection for some time and that the density in the right upper lobe, seen on the first roentgenogram (figure 8), was due to lobular atelectasis resulting from temporary plugging of a bronchus. It is difficult to account for the suggestive cavity in the right upper lobe. It is possible that there was beginning necrosis in the lobular atelectatic area, the patient emptying the necrotic material spontaneously when plugging of the bronchus was no longer present.
Case 5. S. M. F., male, aged 39 years, a salesman, was seen by one of the present writers (E. S.) on July 18, 1939. On May 30, 1939, the patient was taken ill with a productive cough, slight elevation of temperature, and occasional mild wheezing, but no frank asthmatic attack. He consulted a physician who referred the patient to a roentgenologist. A roentgenogram of the chest was taken and a diagnosis of resolving pneumonia or tuberculosis in the right lung was made. The subjective symptoms subsided in a few days. About one week after the onset of the present illness the patient had an attack of dyspnea which was diagnosed as bronchial asthma by his physician who administered adrenalin and ephedrine, giving the patient some relief. Immediately following this episode the patient began to cough again. He perspired freely, there was slight elevation of temperature, and he began to lose weight and strength. Another chest roentgenogram was taken; a definite diagnosis of tuberculosis was made; and the patient was referred to one of the present writers (E. S.).

The significant findings noted on the first examination (July 18, 1939) were harsh breathing over the left lung anteriorly and coarse râles posteriorly in the interscapular region. The left lung was clear. The heart was entirely negative. Blood

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Fig. 10. (Case 5.) Roentgenogram taken May 31, 1939. Dense infiltration involving almost the entire right lung. Increase in lung markings throughout the left lung.
pressure was 110 mm. Hg systolic and 70 mm. diastolic. The spleen was not enlarged. Temperature was 99.5° F.

Laboratory Data. July 31, 1939. The blood count showed: hemoglobin, 85 per cent; red blood cells, 4,500,000 per cu. mm.; white blood cells, 14,200 with polymorphonuclears, 68 per cent; lymphocytes, 20 per cent; eosinophiles, 11 per cent and basophiles, 1 per cent. On August 21, 1939, the blood count showed: hemoglobin, 80 per cent; red blood cells, 4,650,000; white blood cells, 12,600 with polymorphonuclears, 64 per cent; lymphocytes, 21 per cent and eosinophiles, 15 per cent. Another blood count on October 23, 1939, showed: hemoglobin, 85 per cent; red blood cells, 5,100,000; white blood cells, 8,500 with polymorphonuclears, 76 per cent; lymphocytes, 19 per cent; monocytes, 2 per cent; eosinophiles, 2 per cent and basophiles, 1 per cent. A number of sputum examinations, including several of concentrated sputum, did not reveal the presence of tubercle bacilli. A search for fungi and spirochetes in the sputum gave negative results. A stool examination failed to show the presence of ascaris larvae.

Fig. 11. (Case 5.) Roentgenogram taken July 31, 1939. Complete clearing of the infiltration in the right lung. Scattered infiltration throughout the left lung.
Roentgenograms. A chest roentgenogram (figure 10), taken on May 31, 1939, showed dense infiltration involving almost the entire right lung. There was increase in lung markings throughout the left lung. On July 31, 1939, the chest roentgenogram (figure 11) showed almost complete clearing of the infiltration in the right lung field, but the left lung showed scattered infiltration throughout the lung field. Another chest roentgenogram (figure 12), taken on August 18, 1939, showed some clearing of the infiltration throughout the left lung field. In the right lung, however, scattered infiltration throughout the lung, particularly in the second interspace, had reappeared. On September 15, 1939, a chest roentgenogram (figure 13) showed relatively little change in the right lung as compared with the previous film. In the upper half of the left lung field there was now evidence of dense infiltration. On September 29, 1939, the chest roentgenogram (figure 14) showed complete clearing of the infiltration in both lung fields. Chest roentgenograms taken on October 23, 1939, and January 20, 1940, showed no change from the film taken on September 29, 1939; no abnormal changes were noted.

Course. July 31, 1939. Temperature was elevated, occasionally as high as 101° F. The cough became spasmodic in character and the patient experienced difficulty in raising sputum. He complained of pain over the right side of his chest.
Examination revealed moist râles and rhonchi throughout the left lung; there were a few râles in the right lung. The patient was seen again on August 21, 1939, after two weeks' rest in the country. The temperature remained elevated, frequently to 101.4° F. There was a slight cough productive of scanty, odorless expectoration. He had no wheezing or asthmatic attacks but complained of a sense of oppression over the front of the chest. The râles and rhonchi had disappeared. He reported again for examination on September 1, 1939. Except for a slight unproductive cough the patient was symptomless. He had gained four and one-half pounds in weight. Physical examination of the chest was entirely negative. On September 15, 1939, he had no complaints. He had gained five more pounds in weight. There were no abnormal physical findings. September 22, 1939. The patient continued to gain in weight. There was some edema of the left eyelid and supraorbital region which was thought to be due to some allergic manifestation. Otherwise, the physical examination was entirely negative and the patient was symptomless. October 23, 1939, the edema of the left eye lid had disappeared. Abnormal physical findings were absent and the patient claimed that he felt well. The patient returned for routine examinations in November 1939, January 1940, and was last seen in June 1940. He had returned to work in October 1939. He continued to gain weight and had no complaints. Physical examination remained negative.
Comment. This case presents an interesting clinical picture of transitory, migratory pulmonary infiltrations associated with eosinophilia. Except for the absence of cardiac manifestations and the migratory character of the pulmonary infiltrations there is a close similarity between this case and the first one presented. The infiltrations in both instances were not of a tuberculous nature. It is believed that the pulmonary manifestations in these two cases were on an allergic basis.

DISCUSSION

Cases 2 and 3 presented chest roentgenograms indistinguishable from roentgen pictures of pulmonary tuberculosis. Both patients had bronchopneumonia, probably caused by a filtrable virus. During the past several winters such cases have been not uncommonly observed. The roentgenogram at the onset of the illness, the symptoms and blood picture closely simulate the exudative type of tuberculosis. In order to arrive at a definite diagnosis, before instituting collapse therapy, it is wise, therefore, to take
serial chest roentgenograms and make a thorough search for tubercle bacilli in the sputum and aspirated gastric contents.

Although the diagnosis in case number 4 was not definitely established, the infiltration and rarefaction seen on the first roentgenogram (figure 8) were thought to be due to lobular atelectasis with beginning pulmonary necrosis as a sequence of bronchial obstruction. Similar roentgenograms which not infrequently need to be differentiated from pulmonary tuberculosis are seen in cases of pulmonary neoplasms and lung abscess. Bronchoscopic examination, serial roentgenograms and absence of tubercle bacilli disclose the non-tuberculous nature of the pathologic bronchopulmonary process.

Cases 1 and 5 present interesting problems in pathogenesis. In connection with these cases it is of interest to refer to reports by Smith, Müller, and Löffler, who described similar cases, and to review the latter report by Löffler in some detail. In 1936 he reported 51 instances of patients with transitory pulmonary infiltrations associated with eosinophilia in every case. The roentgenograms presented various types of densities described as follows: (1) large, more or less irregularly outlined densities which were unilateral or bilateral; (2) small infraclavicular infiltrations of the type described by Assmann; (3) multiple unilateral or bilateral circular densities; (4) sharply defined densities situated in the right middle lobe; (5) infiltrations indistinguishable from the adult-type of pulmonary tuberculosis. In the differential leukocyte count the number of eosinophiles ranged between 10 and 50 per cent. In some instances the eosinophilia reached a peak when the pulmonary infiltration had almost entirely cleared. Eosinophilia persisted for some time in some of the cases. There was no strict parallelism between the extent of the eosinophilia and the pulmonary infiltration. Some of the patients who had blood counts prior to the appearance of the pulmonary infiltrations showed no eosinophilia. Occasionally there was a leukocytosis up to 15,000 white blood cells. The sedimentation rate as a rule ranged between 8–15 mm. in one hour; in a few cases a more rapid rate was observed. Constitutional symptoms were mild or entirely absent. The clinical course was very benign, and the infiltrations on the roentgenograms cleared in three to eight days. In only one instance did pulmonary infiltration reappear, and that occurred one year after the original episode. Sputum specimens of all the patients were examined for tubercle bacilli with negative results in every case. All the patients were adults and most of the cases occurred during the months of July and August. In two instances the condition was noted in members of the same family. In 37 cases the tuberculin reaction was positive and in 13 instances a negative reaction was obtained.

Löffler discusses the pathogenesis of this clinical entity. He rules out pulmonary embolism with infarction, pneumonia, bronchial asthma with partial atelectasis, and pulmonary tuberculosis. He considered ascariasis as the etiology, but examination of the sputum and stools did not disclose the presence of ascaris larvae in a single instance. Löffler thinks that the
pathogenesis in these cases is similar to erythema nodosum; the lung reacts with an inflammatory exudate to a toxin. It is his impression that the pulmonary manifestation is on an allergic basis.

Cases 1 and 5 described by the present authors can be grouped with the clinical entity described by Löffler. Both patients had transitory pulmonary infiltrations associated with eosinophilia. The clinical picture in these two instances differed in some respects from the majority of cases in Löffler’s series. The symptoms in the present cases were more pronounced and persisted for longer periods of time. The pulmonary infiltrations observed on the serial roentgenograms showed less rapid clearing, and in case 5 the infiltrations were of a peculiarly migratory character. However, it is suggested that the differences can be explained logically on the basis of a more intense and prolonged allergic response to some allergen. The agent producing the allergic reaction in the two cases presented was not determined. It should also be pointed out that Löffler did not observe cardiac manifestations in any of his patients; at any rate, he makes no mention of them. In case 1 there was evidence of right-sided cardiac strain. Here again, it can reasonably be assumed that because of the more pronounced allergic reaction the pulmonary exudate persisted for a sufficient length of time to produce increased resistance in the pulmonary circulation resulting in right ventricular strain. With the absorption of the pulmonary exudate the heart returned to normal size.

SUMMARY AND CONCLUSIONS

1. Five cases of non-tuberculous pulmonary disease mistaken for pulmonary tuberculosis are presented.
2. Reliance on a single chest roentgenogram for diagnosis frequently leads to error.
3. When tubercle bacilli cannot be found in the sputum or aspirated gastric contents by all methods of examination, including cultures and guinea pig inoculation, it is extremely unlikely that the bronchopulmonary disease is of tuberculous etiology.
4. The clinical picture and pathogenesis of pulmonary infiltrations associated with eosinophilia are discussed.

BIBLIOGRAPHY