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A Case of Silicosis Showing Multiple Pathological Lung Changes

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Each year the Northern Rhodesia Silicosis Medical Bureau examines about 4,000 European and 30,000 African miners employed in the Copper Mines. An examination includes a radiograph of the chest. Although different lung diseases are occasionally encountered, the main pathological disorder seen is silicosis or tuberculosis or a combination of both.

Tuberculosis is the commonest complication of silicosis, especially in African miners. It assumes a readily recognisable pattern both clinically and radiologically. In the following case, however, although this sequence of events took place, there was in addition a third and unexpected finding, as the miner, a European, had silicosis, tuberculosis and a malignant tumour of the lung, which histologically was suggestive of an alveolar cell type of tumour. Good *et al* (1950) stress the relative rarity of alveolar cell tumours in the lung. They refer to the 52 cases reported in the literature and report in detail a further 12 cases they encountered. It is for these reasons that the case is considered of sufficient interest to merit publication.

Case Report

The patient was a European miner, aged 56, with a history of 345 months' mixed mining in the scheduled Rand Gold Mines and the Copper Mines of Northern Rhodesia.

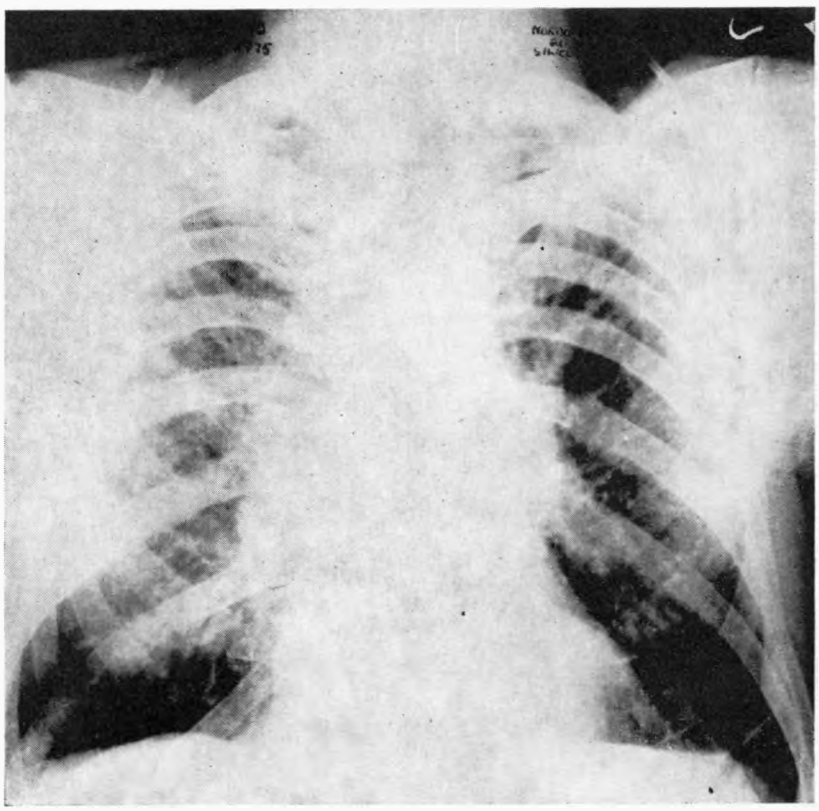

Fig. 1—Silicosis. Note the diffuse bilateral fibrosis with coalescence of lesions.

The man was a known silicotic, and at his routine yearly examination on 21st February, 1949, the following findings were recorded: he complained of dyspnoea on exertion and of a dry, unproductive cough, but was working full-time underground. Examination of the chest revealed restricted movement with deficient expansion. The percussion note was resonant throughout and the air entry was deficient at

both bases with prolonged expiration. No adventitious sounds were detected.

The sputum was negative for the tubercle bacillus and the blood sedimentation rate was 24 mm. in the first hour.

A chest skiagram (Fig. 1) showed diffuse bilateral pulmonary fibrosis with coalescence of the lesions at the right mid and upper zones.

He was referred for examination a year later, when he stated that a few weeks previously he had noticed that he easily became tired and experienced pain in the right side of his chest. His cough at first was dry, but he now produced copious sputum which was at times blood-stained. Dyspnoea had increased and night sweats had become troublesome. He stopped work two weeks prior to the examination. Over the year he had lost 10 lbs. He was now orthopnoeic and there was some facial cyanosis. Examination of his chest showed impairment of the percussion note at the right mid-zone where the respiratory murmur was bronchial and the vocal resonance increased. There were numerous rales audible over the right mid-zone. The sputum was positive for the tubercle bacillus and blood sedimentation rate 78 mm. in the first hour a chest skiagram (Fig. 2) now showed an extensive opacity occupying the whole of the right lung.

A diagnosis of tuberculosis complicating silicosis was made and the patient was admitted to hospital. As he did not respond to treatment and continued to deteriorate, he was re-examined two months later, when the striking feature noticed was the marked loss of weight. He was still dyspnoeic at rest, but was now markedly cyanosed. His sputum remained blood-stained. On percussion the right lung was stony dull. The respiratory murmur was absent and the vocal resonance decreased over

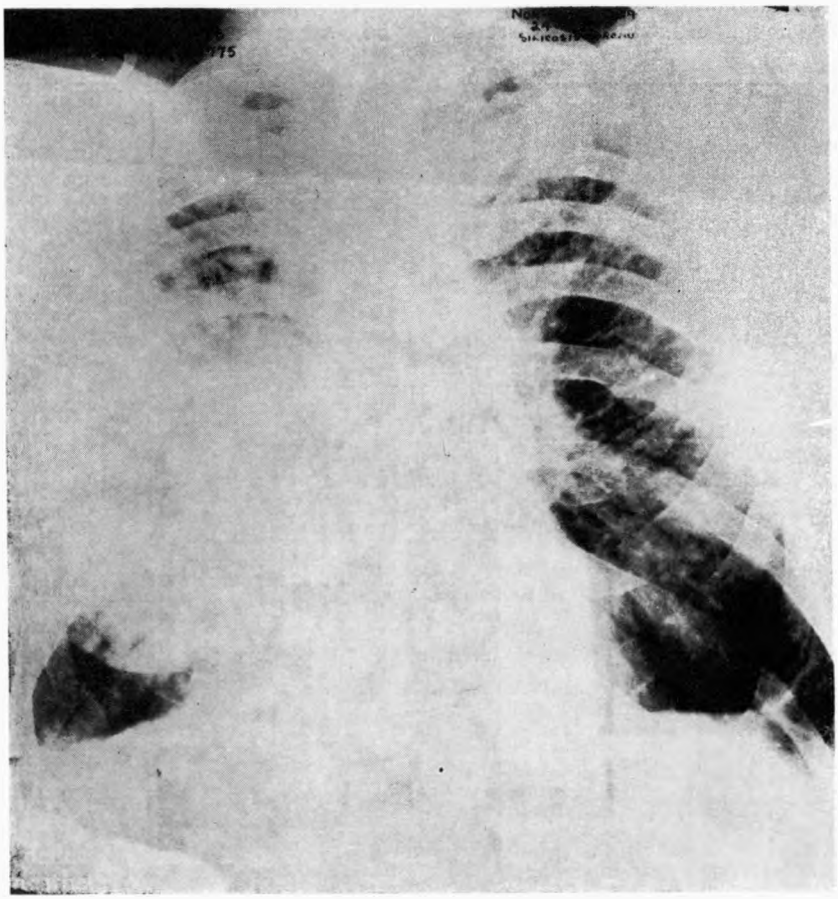

Fig. 2—Note the large opacity in the right lung. The sputum contained tubercle bacilli.

the right side. Clinically he had a gross pleural effusion. The sputum was positive for the tubercle bacillus and the B.S.R. 100 mm. in one hour.

A chest radiograph (Fig. 3) showed a massive effusion on the right side without mediastinal shift, suggestive of an underlying collapse. Aspiration of the chest produced a clear, straw-coloured fluid without significant findings on microscopical examination. The possibility of primary bronchogenic carcinoma being present in addition to silicosis and tuberculosis was suggested in view of the clinical and radiological findings. The patient died two months later.

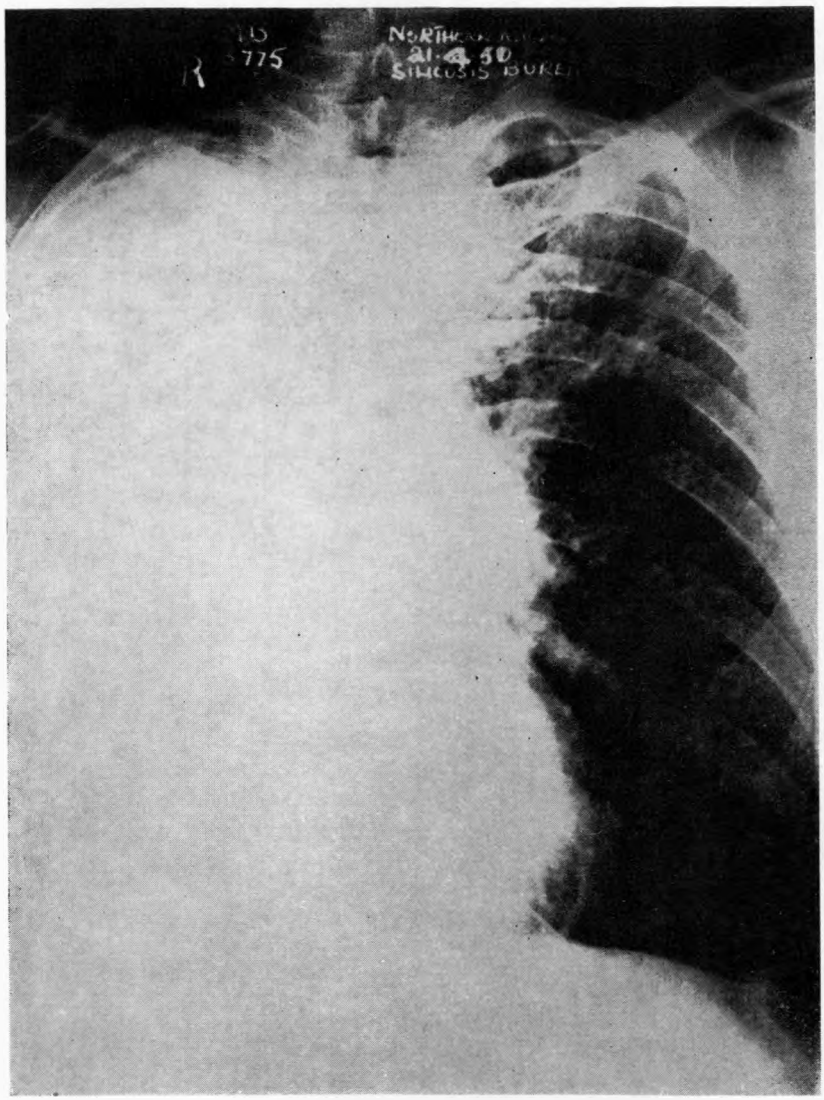

Fig. 3—Showing a massive right-sided pleural effusion without mediastinal shift.

Post Mortem Report

In the right pleural cavity a massive effusion was present. The pleura was grossly thickened and adherent to the chest wall. There was also slight thickening of the pleura of the left lung. The heart was dilated with a small overlying pericardial effusion. No significant abnormality was found in any of the other organs. The cut surface of the right lung revealed pale brown

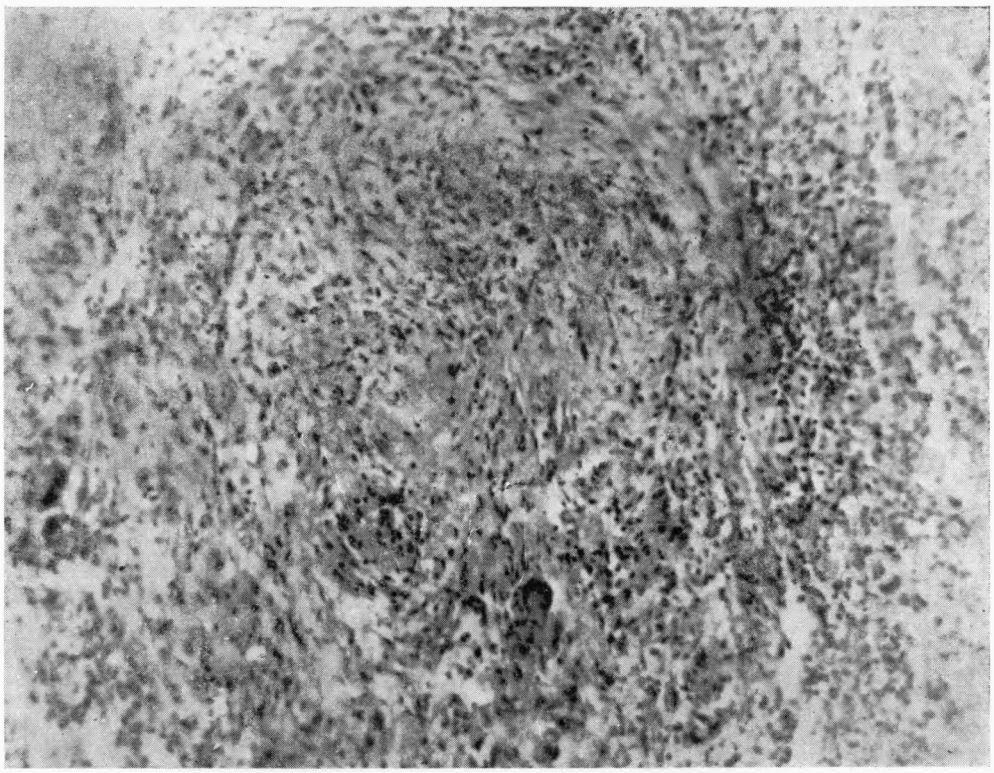

Fig. 4—Tuberculous granulation tissue.

Fig. 5—A typical silicotic nodule.

lung tissue in which silicotic nodules were scattered profusely; some had a central canal and others a yellow caseous centre. Caseous tuberculous nodules were also visible (Fig. 4).

There were also discrete nodules of rubbery, pinkish-white tissue scattered about the surface and often aggregated into groups. Sections taken of these showed them to be due to advanced silicosis of the infective type, with either zones of massive fibrosis or with complicating caseous tuberculomata. There were also a few well-formed single silicotic lesions with characteristic hyaline whorled fibrosis containing dust cells (Fig. 5).

In parts of each section examined there was a collection of small round or oval cells, some being multinucleated. These occupied and appeared to line intact alveolar spaces (Fig. 6). No direct connection could be traced with a bronchus nor did they show microscopically any fixed relation to the bronchi. Whatever the origin of these neoplastic cells, they showed pleomorphism of a degree unusual even in bronchial carcinomata.

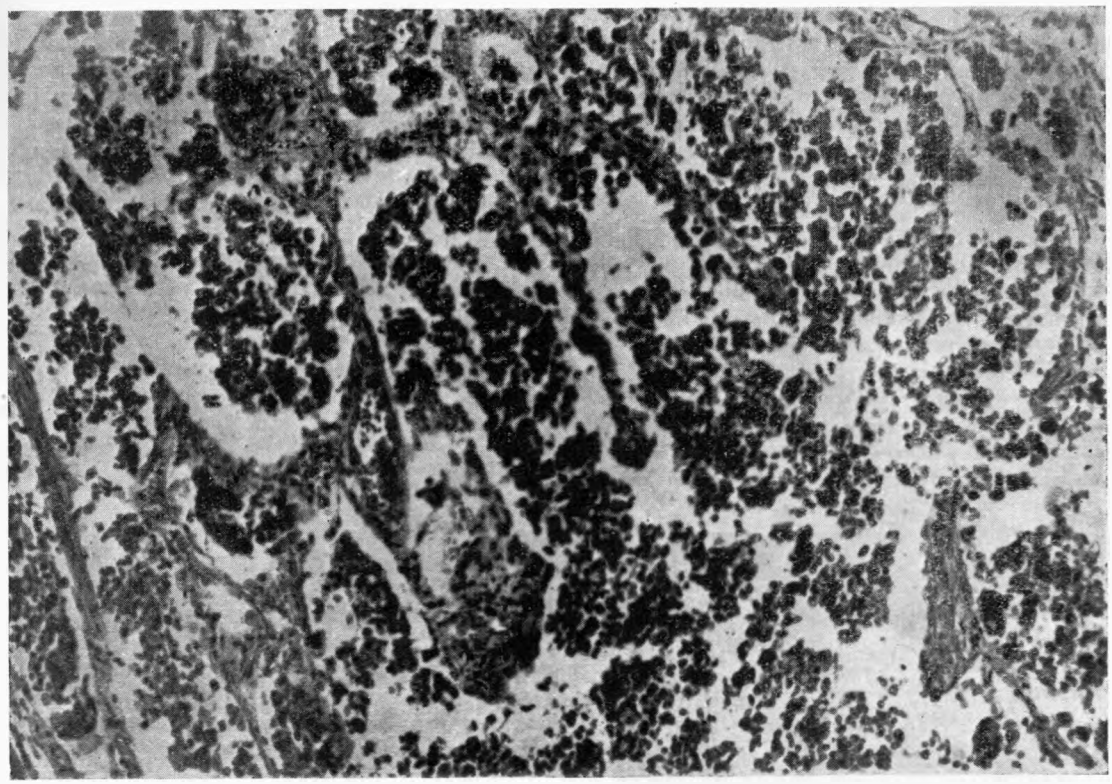

Fig. 6—Malignant cells lining and occupying the alveolar spaces.

REFERENCE

Good, C. A., McDonald, J. R., Clagett, O. T. and Griffith, E. R. (1950). "Alveolar Cell Tumours of the Lung." *American Journal of Roentgenology and Radium Therapy*, 64, 1.

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