should again be emphasized in this connexion that in assessing evidence of calcification in the x-ray films the interpreters had no knowledge of the individual histoplasmin or tuberculin tests. These findings, although based on relatively small numbers, compare closely with those found by Goddard *et al.* among a large series of student nurses in the United States. In the latter investigation it was found that approximately one-third of the nurses reacting to histoplasmin, or to histoplasmin and tuberculin, had pulmonary calcification, whereas approximately 10% reacting only to tuberculin showed evidence of calcification.

Radiological evidence of pulmonary calcification amongst the natives of Kenya is not therefore necessarily indicative of healed tuberculosis; the evidence indicates that it may be due to a past infection of histoplasmosis. It may also be said that radiological evidence of persistent pulmonary infiltrations, as distinct from calcification, may be due to infection by *H. capsulatum*, as Furcolow *et al.* (1947) have indicated that such infiltrations in children are much more often associated with histoplasmin than with tuberculin sensitivity.

Summary

Intradermal sensitivity tests performed on 768 adult African males show an overall sensitivity rate of 8.5% to 1:100 histoplasmin. A further 4.3% of the subjects showed minimal indurations of under 5 mm. to the histoplasmin test.

It is highly unlikely that these reactions are due to contamination of the histoplasmin solution with tuberculin, but it is possible that some of the smaller reactions are due to cross-reactions with other antigenically related fungi.

X-ray films of 130 of the subjects were examined for calcification under controlled conditions. Calcification was observed in 12.3% of the films.

In the tuberculin-positive subjects the incidence of radiological evidence of calcification among histoplasmin reactors was four times the incidence observed amongst the histoplasmin non-reactors. The same tendency can be seen in the tuberculin-negative group of subjects.

Those with minimal reactions to the histoplasmin test did not show the incidence of calcification that was observed in the histoplasmin-positive group and showed only a slightly higher incidence than that of the histoplasmin-negative group.

The appearance of calcification in an x-ray film of a Kenya African does not necessarily indicate a past tuberculous infection, as it may be due to a past infection with *H. capsulatum*. The diagnosis of histoplasmosis should be considered in the face of a negative tuberculin test associated with a persistent pulmonary infiltration.

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A CASE OF PULMONARY HAMARTOMA

BY

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The term "hamartoma"—from a Greek word meaning "to err"—was coined by Albrecht (1904), who defined it as "a tumour-like malformation in which in truth one can demonstrate only an abnormal mixture of the normal developmental components of the organ in which they occur, whether it be with regard to the quantity, to the arrangement, or to the degree of development, or in all three respects." He actually used this term for cavernous malformations of the spleen and liver, and also for the fibromata of the medullary substance of the kidney. Both Goldworthy (1934) and Jaeger (1934) used the word for a similar malformation occurring in relation to bronchi. More than 125 cases have been described up to date.

The tumour varies enormously in size. Usually a globular, solid, firm growth of the diameter of a two-shilling piece, it is of greyish-white colour and has a rough nodular surface. Commonly there is round it a capsule consisting of very loose areolar tissue. Microscopically it has a characteristic picture. The predominant tissue is cartilaginous, and may show calcification or even ossification at times. Such islets of cartilage are separated by varying amounts of mesodermal and epithelial tissues, which include fibrous and adipose tissues, epithelial clefts giving at times the appearance of a gland (the epithelium may be cuboidal, columnar, or transitional), smooth muscle fibres, and blood vessels. Essentially these tumours are benign, although very rarely they may undergo malignant transformation. The case reported by Simon and Ballon (1947) did show malignant changes.

Hamartomas can occur in any part of the lung, more commonly, it is said, in the lower lobes. Most of them are peripheral and subpleural, but a few are hilar in relation to the main bronchi. They are supposed to be more common in males than in females in the ratio of 3 to 1, and can occur at any age. Jones (1949) described one in a newborn baby. However, the majority of them are seen in the middle-age groups of 35 to 50 years, perhaps because of their asymptomatic course. Clinically most of the patients are symptomless and the lesion is usually detected on routine chest radiography. When subpleural there is often pleuritic pain. When the lesion is situated at the hilum symptoms of dyspnoea due to bronchial obstruction and of cough with sputum and fever due to infection behind this obstruction may occur.

Pre-operative diagnosis is rarely possible. A rounded shadow in a chest radiograph with well-defined margins, surrounded by normal-looking lung tissue and some scattered calcium in the shadow, when seen in an asymptomatic person strongly suggest the possibility of a hamartoma. No other investigation is helpful except rarely in the hilar variety, when a bronchoscopic biopsy may prove to be diagnostic. Diagnosis is usually arrived at by thoracotomy, when the tumour alone may be removed or, if necessary, with a part of the lung as well.

Case Report

A man aged 53 first had pains in the left lower chest and upper abdomen in 1949. These were sharp and stabbing in character, and very variable in duration. Thorough investi-

gation showed nothing abnormal. In 1950 a chest radiograph showed a prominent left hilar shadow and thickened pleura at the left base. In January, 1952, these changes were well marked (Figs. 1 and 2), and he was referred to the Brompton Hospital.

In February, when first seen at Brompton, he still complained of these pains in the left lower chest and upper abdomen, and of cough with 2 to 4 oz. (57 to 85 ml.) of purulent sputum daily, loss of weight, and hoarseness of voice of about six months' duration. He was admitted under the care of Sir Geoffrey Marshall on April 7 for further investigation. On examination he was seen to be a man of average physique with a moderate degree of finger-

FIG. 1.—Chest radiograph showing well-marked changes.

FIG. 2.—Lateral view.

clubbing. He had a swinging temperature rising to 101° F. (38.3° C.). A small firm lymph node was palpable above the left clavicle. On the chest a big transverse scar was seen, extending from the mid-clavicular line in the fourth left interspace across the axillary region to the inferior angle of the left scapula on the back. That was the result of drainage of an empyema at the age of 5. He also had physical signs of collapse of the left lower lobe. A provisional clinical diagnosis of bronchial carcinoma was made. The cough, with sputum and rise of temperature, was attributed to infection in the collapsed lobe.

A report by Dr. J. W. Clegg on a bronchial biopsy specimen taken on July 8 stated: "The biopsy is a small bronchial papilloma covered by epithelium showing a transitional metaplasia. Below the epithelium there are a mass of fatty tissue and a few atypical mucin-secreting glands. The appearances strongly suggest a benign hamartoma of the bronchus." A left lower lobectomy was performed by Sir Clement Price Thomas on July 18. The specimens removed at the operation showed the following features, as reported by Dr. J. W. Clegg: "Two operation specimens were received—a lower lobe and a segment of bronchus 3 cm. long dilated by an endobronchial polypoid tumour measuring 2.5 cm. in diameter. This tumour was found to consist chiefly of fat, but there were also areas of cartilage and small numbers of mucin-secreting glands present (Fig. 3). The surface of the tumour was covered by a transitional type of epithelium. These are the classical features of an endobronchial hamartoma. . . ."

FIG. 3.—Photomicrograph of specimen of tumour. (×85.)

The patient was discharged for convalescence on August 9.

Comment

When this growth occurs in the cancer age group it is almost impossible to distinguish it clinically from bronchial carcinoma, and the diagnosis is usually post-operative. This case, however, illustrates the possibility of arriving at a correct pre-operative diagnosis. Even when, as in this case, the growth is within reach of the bronchoscope it may be difficult to obtain a satisfactory bronchoscopic biopsy. The difficulty may be due to the nature of the tissues in the growth—namely, the adipose and cartilage tissues, on which the biopsy forceps slips off easily.

I am grateful to Sir Geoffrey Marshall for encouragement and most valuable guidance during the preparation of this case record, and to Dr. J. W. Clegg, pathologist to the Brompton Hospital, for the detailed report on the bronchoscopic biopsy and the operation specimens. I wish to thank Sir Clement Price Thomas for permission to report this case, Dr. J. G. Scadding for offering me the help of the Photographic Department of the Institute of the Diseases of the Chest, and Mr. D. F. Kemp for the photographs.

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