THE RADIOSCOPICAL DIAGNOSIS OF FILARIASIS.

BY

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HOSPITALS in tropical countries are not as a rule provided with x-ray apparatus, and consequently medical practitioners in the tropics have not often the advantage of investigating cases by this simple and reliable method of diagnosis; radioscopy cannot be introduced where electrical plant is not installed. This field of medicine has, however, not been neglected when opportunity admitted. Ample evidence of progress in this respect was afforded recently in London by demonstrations of the diagnosis of tropical bowel ailments, and in Egypt by the notable work of G. O. Lotsy, Mahmoud Affifi, J. E. Bateman, and others, who have so strikingly brought the later complications of bilharziasis within the region of exact diagnosis by the x rays.

One form of filariasis may be considerably illuminated by the x rays—the filariasis due to the invasion of the trematode worm *F. bancrofti*, which in its adult and larval stages infests the human lymphatics, and is a widespread infection of many tropical countries, being transmitted by the three genera of mosquitos—*Culex*, *Aedes* or *Stegomyia*, and *Anopheles*.

The disease, though not indigenous, is by no means unknown in England; its late manifestation, elephantiasis, appearing after a person has left the tropics. In its earlier stages filariasis (*F. bancrofti*) may be a silent disease giving rise to no symptoms, only diagnosable by blood examination (eosinophilia and the presence of larvae).

Elephantiasis may not show itself for an undefined number of years after the initial infection with the parasite; it is not, of course, a silent phase of the disease, but mild and early cases are not easy to diagnose with certainty because, the adult parasites being dead, the larvae have disappeared from the blood, and eosinophilia is not always present. A patient may present himself with a limb or appendage somewhat bigger than its fellow, which on examination exhibits a little solid oedema, perhaps conspicuous superficial veins, but, objectively, little more. If it be the lower limb, as it frequently is, the patient may experience a sensation of tenseness and numbness after walking—a feeling that it does not belong to the owner; such symptoms are not peculiar to elephantiasis. No doubt this condition will be suspected if there is a history of residence in the tropics. If, however, the blood examination is negative the diagnosis is a matter of opinion. Well-marked cases with characteristic signs due to much lymphatic obstruction following oft-repeated infections are easily diagnosed without the assistance of radioscopy; they are seldom seen in England, but in mild cases, where the parent worms are dead, calcified, and encysted, x rays may be a valuable help to diagnosis. The case which I am recording is one in point.

A missionary, aged 62, had spent thirty-four years in South Africa in a parish of 649 square miles, situated between Durban and East London on the east coast, with the Indian Ocean on the east and the Drakensberg range on the west—the Transkei native settlement. During the first fourteen years he spent one night at one place and the next night at another, and so on, month by month; he was frequently bitten by bugs and mosquitos in the huts which he tenanted. It is worthy of record that he had never suffered from malaria or dysentery; in fact, he never had a day's illness during his thirty-four years in Africa. For the last eighteen years he was more or less stationary at Tsolo, Kaffraria.

Diagnosis in his case was important, for he had for some time been looking after a leper, and he himself suspected that he had leprosy. The usual examination of faeces and blood were made, with negative results; there was a trifling eosinophilia (5 and 9 per cent.), but the nocturnal and diurnal blood contained no larvae. The urine was normal, as was the heart; in fact, the only pathological condition present was some calcareous degeneration in the arteries shown well in the anterior tibial artery in one of the films which were taken. The left leg was quite normal; the right was a little larger, the calf by $1\frac{1}{2}$ inches and the thigh by 2 inches. Beyond the sensation of increased weight and the feeling that the leg did not belong to him—sensations experienced after walking—there were no subjective symptoms. Except for some conspicuous veins the skin was natural in appearance; the

tactile and other afferent sensations were normal. He recently had no difficulty in walking fifteen to twenty miles a day in Switzerland.

Comment.

I have seen an x-ray film from South Africa presenting a somewhat similar cystic condition, though the cysts were much more numerous and appeared to be distributed to all the skeletal muscles of the body, including the face muscles. The cysts were much the same shape as in my case. This film was that of a native infested with the *Cysticercus cellulosae*. The individual cysts appeared to be larger than those of *F. bancrofti*, and there is no reason for thinking that the present case was a case of *Cysticercus cellulosae*. I hoped to have been able to reproduce the photographs of the case and the x-ray films, but this was not practicable.

The right leg is slightly larger than the left. Small oblong cyst-like objects occur in the thigh and calf, though only scantily, one in the thigh and one (perhaps two) in the calf; they may well be occupying lymphatic vessels. They appear to taper towards one end; on the films the shadows seem to be about half an inch long, the thick end appears to be of a lighter shadow than the tapering end. I had the leg x-rayed in two or three positions, and the objects were always there, altered, of course, in position according to posture.

I examined radiologically other parts of the body—the pelvis, abdomen, chest, and neck—but I could find no filaria worms occupying the lymphatics elsewhere; no doubt others were present, but they were not calcified and therefore did not show in the films.

The cysts which are visible appear to be about half an inch long, to be thicker at one end, tapering to the other; the broad round end appears to be of a lighter shadow on the film.

DIFFERENTIAL DIAGNOSIS OF SPUTUM IN
CHRONIC LUNG INFECTIONS.

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THE differential diagnosis of a sputum demands not only its direct microscopical examination, but the preparation and examination of cultures. With respect to the former, when tubercle bacilli are found they may be classified into long, short, or minute forms, and further note may be made of whether or not the organisms are granular, and of the occurrence or otherwise of clumping. The most chronic clinical type of tuberculosis appears to be associated with the presence of long granular bacilli showing clumping; the most acute type with minute, non-granular, and scattered bacilli. At the same microscopical examination the presence of "other organisms" should be noted. These are commonly *B. influenzae*, pneumococci, streptococci, and staphylococci.

Whenever "other organisms" occur a cultural examination has shown them to be invariably associated with yeast-like fungus forms. It follows that as the simplest culture medium for the growth of fungi is beer wort, samples of all sputa should be put up for culture on this medium. The vast majority of fungi thus cultivated belong to the group of fungi imperfecti, and are chiefly moniliae. In approximately 85 per cent. of cases moniliae are found alone; in the remaining 15 per cent. they are found associated with other fungi. Castellani's pathogenic forms are frequently isolated.

The literature on the subject of monilia infection of the lungs is accumulating, but, unfortunately, moniliasis is usually referred to as a tropical disease. As a result, however, of the above routine examination of sputa one is forced to the conclusion that a large percentage of patients suffering from tuberculosis of lung are suffering also from moniliasis, and that in cases in which fungi are not present the patient is usually not so much a sufferer as a carrier of tubercle. The following is a classification of the results of 2,373 systematic differential examinations of the sputa from 304 patients during 1928: of the 304 patients, 62 were