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.

BY

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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 monilias. In approximately 85 per cent. of cases monilias 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

negative both to tubercle and to fungus infection; of the remaining 242 patients, 6.61 per cent. were infected with tubercle bacillus only, 27.27 per cent. with mixed tubercle bacilli and blastomycetes, and 65.11 per cent. with blastomycetes only.

What may be the significance of the presence of these blastomycetes? They are always to be found in sputa containing "other organisms," and whether considered as pathogenic or non-pathogenic they certainly appear to be activators of growth, not only of "other organisms," but also of the tubercle bacillus. Treatment with vaccines and with alkaline potassium iodide causes the disappearance of the fungus and the diminution, at times a total disappearance, of the tubercle bacillus. Potassium iodide is recognized as the drug of choice in the treatment of fungus infections, and it may be noted that the tubercle bacillus is classed as a fungus belonging to the family Mycobacteriaceae. In Jersey differential diagnosis and differential treatment of tuberculous infections have been associated with the striking fall in the total death rate from all forms of tuberculosis which followed the institution of the bacteriological laboratory in 1922. The reduction in these deaths in the years during which differential methods have been employed is shown in the accompanying table.

Year.	Tuberculosis Deaths.	Year.	Tuberculosis Deaths.
1922	86	1926	53
1923	62	1927	55
1924	65	1928	47
1925	49		

Conclusion.

It is considered that the fall in deaths from tuberculosis has been due to the foundation of a laboratory, which has allowed of differential diagnosis and consequently of differential treatment.

TREATMENT OF SEPTIC HANDS AND FEET ON SHIPBOARD.

BY

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WHILE acting as a temporary ship surgeon on a cruise extending over a period of five months, I recently had occasion to treat a series of septic hands and feet among some of the crew. Owing to lack of facilities, instruments, and drugs, I was forced to employ methods differing considerably from those to which I was accustomed. But the apparent success was such that publication of some of these facts might be helpful to someone similarly situated, or might interest someone in a better position than myself to carry on further investigation.

Most of the cases occurred in the tropics, which have a bad reputation for prolonged healing in septic cases. The commonest condition was septic hands among firemen, probably caused by blistering or burning of the skin of the palm, dirt, grease, and infection being then well ingrained into the wound.

Routine Treatment of Abscesses.

The general routine treatment was to open up the abscess with an incision at least one to one and a half inches in length, make no attempt to prevent bleeding, which at times was quite brisk, and then plunge the septic limb into a hot iodine bath (1 drachm of tinctura iodi mitis to a pint of hot water). A gauze dressing soaked in hydrogen peroxide was then applied (hydrogen peroxide, besides being an antiseptic, is a very useful haemostatic), and a bandage was tied well above the wound. Thus for a septic hand the arm would be bandaged above the elbow, just tight enough to cause venous congestion, and left in position for twenty-four to forty-eight hours. The patient was instructed to return the next day, or later in the same day, if the infection appeared acute, when the dressing would be soaked off in another iodine bath and a dressing of glycerin and magnesium sulphate (equal parts) on lint or gauze would be applied.

Glycerin and magnesium sulphate dressings would be repeated three times a day for the first two days, each dressing being soaked off in a hot iodine bath, and then twice a day until the wound appeared clean and no pus was apparent, when a dry dressing of iodoform powder on lint was employed. In every case, having once made an incision large enough to allow the pus to escape, the wound was touched as little as possible. No attempt was made to express pus by squeezing, but the patients were encouraged to move the affected limbs themselves whilst they were soaking them in the bath.

The advantages of this method are: (1) The apparatus is simple, all that is required being a basin, a bottle of tinctura iodi mitis, some hot water, a bottle of glycerin and magnesium sulphate, and some gauze or lint. (2) It is comparatively painless. (3) It eliminates the necessity for hot fomentations, which are difficult to apply effectively and only transitory in their action.

Choice of an Anaesthetic.

Out of a total of fifteen cases (three Europeans and twelve Chinese) I operated on four by freezing with ethyl chloride local anaesthesia. The disadvantages of freezing are that it undoubtedly causes intense pain during the thawing process, and its anaesthetic effect is so transitory that the operator has time only for a quick stab with the knife. In three cases no anaesthetic of any sort was employed, and apart from the momentary pain of the incision, the patients appeared to experience less pain in the aggregate than those who had been subjected to ethyl chloride anaesthesia.

I also endeavoured with the last eight patients to ascertain whether nerve blocking with 2 per cent. novocain would have any effect as an anaesthetic, or whether injecting the fluid into a septic limb would have any deleterious effect on the septic condition. I found, as the following case records show, that the injection of novocain appeared to have no markedly bad effect in delaying healing, but that as an anaesthetic it gave variable results.

Case 1.—A Chinese fireman with a temperature of 100° F., pulse 100, and a history of pain in the palm of the hand for three days. There was considerable swelling of the palm and some swelling on the dorsum of the hand, the greatest point of tenderness being situated between the fourth and fifth metacarpal bones in the palm. The patient was unable to flex his fingers himself, and the movement of flexion caused considerable pain. Around the ulnar nerve, just behind the internal epicondyle of the humerus, 3 c.cm. of 2 per cent. sterile novocain were injected, and after an interval of ten minutes a vertical incision 1½ inches in length was made over the part where there was most fluctuation. Pus was obtained. The patient appeared to feel a certain amount of pain, but less than with freezing.

After treatment with iodine baths and magnesium sulphate and glycerin dressings was adopted, the wound healed well, and the patient returned to duty in the stokehold on the eighth day.

Case 2.—A Chinese fireman, with cellulitis of foot, temperature 101° F., pulse 100. The whole of the dorsum of the foot was red and swollen, the ankle was oedematous and its contours were eliminated. Around the external popliteal nerve, just internal to the tendon of the biceps femoris in the popliteal space, 3 c.cm. of 2 per cent. novocain were injected, and after fifteen minutes a 2-inch incision was made on the dorsum of the foot. No pain was experienced from the incision and a serous discharge was obtained. The patient was treated by the method previously outlined. The temperature remained up to 100° for four days, but after that the wound healed well. All the swelling subsided by the eighth day, and he returned to work, attending for daily dressings until the tenth day, when the wound was healed.

Case 3.—A European steward with a subungual paronychia of five days' duration on the ring finger of the right hand. Temperature and pulse were normal. Around the digital nerves 2 c.cm. of 2 per cent. novocain were injected, giving complete anaesthesia at the end of ten minutes. The whole of the nail was removed and two vertical cuts were made, one on each side of the nail bed. A hydrogen peroxide gauze wick was inserted under the flap. The wound was treated with iodine baths and glycerin and magnesium sulphate dressings. The patient was irregular in his attendances, and was never off duty, sometimes washing plates with his bad hand; in spite of this the wound healed in twenty days.

Case 4.—A Chinese fireman with septic third digit of the right foot; the toe was swollen to nearly the size of the big toe. Around the external popliteal nerve 2 per cent. novocain was injected, and after twenty minutes the patient volunteered the statement, through the interpreter, "that his foot felt quite all right, and he would like to return to work." An incision 1½ inches long was made on the dorsum of the toe; no pain was experienced during the incision; the wound was treated as described above and the patient returned to work in eight days.