moved without further examination, and plunged into a saturated watery solution of sublimate. I regret to say that a more careful examination was neglected at that time, because all those present, including myself, mistook these growths for the ordinary tumours caused by the bilharzia hæmatobia, a parasite which I find in quite 50 per cent. of all necropsies on natives of Egypt.

The tumours were kept in a saturated solution of sublimate for twenty-four hours, washed in water for the same period, and gradually hardened in alcohol. It was then discovered that each of these tumours contained a calculus; it shelled out quite easily from the surrounding connective tissue, which formed a capsule around it. The mucous membrane and the submucosa formed the anterior wall of the cyst, the posterior wall consisting of the muscular layer and peritoneum, a thick capsule of connective tissue surrounding the calculi. These calculi were rough, uneven, but not so hard that they could not be cut with a strong scalpel. They were mainly of a yellowish-black colour, but almost white in parts. The addition of a small drop of mineral acid to a fragment at once produced a strong evolution of gas.

Microscopical examination of any one of these calculi showed that they consisted of an amorphous yellowish-brown substance, which contained numberless typical eggs of oxyuris vermicularis. No traces of the worms themselves could be found inside the cyst. Many of the eggs of the smaller calculi were quite normal, and contained embryos showing no signs of degeneration whatever. In the larger calculi, however, very few of the eggs contained any embryos, perfectly transparent shells being all that was left of the eggs. Some of these shells were studded with small yellow crystals, which dissolved with formation of gas on the addition of a mineral acid.

The only possible explanation of these facts is that the oxyuris penetrated through the mucous membrane into the wall of the intestine, and there laid its eggs. These acting as an irritant produced a certain amount of inflammation followed by calcification. The female either found her way back into the intestine, or died and was absorbed.

It is quite possible that this process takes place frequently. Small tumours of the rectum resembling the cysts above described are of frequent occurrence here, but others as well as myself attributed them to the bilharzia hæmatobia, as is undoubtedly the case in the majority of patients. Nevertheless I have noticed that these swellings are not infrequently found in patients who have no bilharzia in any of the other organs of the body.

From the therapeutic point of view the presence of these cysts is important, for many of the ova contained embryos having all the appearances of life. Possible these might at some future time have found their way into the intestine and given rise to further symptoms.

I have carefully read the literature at my disposal, and have not found any account of similar encysted calculi in the walls of the intestine, due to the presence of the eggs of oxyuris vermicularis.

A FILARIA FOUND IN SIERRA LEONE ? FILARIA VOLVULUS (LEUCKHART).

By W. T. PROUT, M.B. EDIN.,
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I AM indebted for the opportunity of describing the following specimen to Dr. Hood, District Surgeon, Sierra Leone. He observed a rounded tumour, about the size of a pigeon's egg, on the buttock of a frontier policeman, who had reported sick, complaining of vague rheumatic pains. In appearance and consistency it resembled a fatty tumour, but, on excising it, it was found to be a cyst containing what seemed to be a mass of filariæ bathed in a semipurulent fluid. Unfortunately the incision, which had been made to open the tumour, had cut across the worms, but I was able to dissect out with difficulty a complete adult male, and numerous fragments of an adult female packed with embryos.

Some time afterwards Dr. Hood was fortunate enough to come across another specimen of the same kind, again in a frontier policeman. The clinical history of the case showed

nothing remarkable. The man complained of weakness, vague pains, and an inability to do his duty, which consisted of going on patrol in the district. A gleet was found, with swollen inguinal glands, and the case was supposed to be of a syphilitic nature. On further examination a tumour was discovered, again in the gluteal region. This was excised, and the man sent down to Freetown, where he was admitted to hospital, and kept under observation for a considerable time. During this period the clinical features were not marked. He still complained of vague aches and pains, which gradually disappeared, and there were occasionally slight irregular rises of temperature. He was put on general tonic treatment, and at the end of a couple of months expressed himself as fit to resume duty, and was discharged. I examined the blood on one or two occasions, but was unable to detect any filarial embryos. I also punctured the inguinal glands with a hypodermic syringe, and examined the fluid which I obtained, also with a negative result. I may state, however, that at that time, owing to pressure of other work, I was unable to devote as much time to the examination of the blood as I should like to have done; and it is possible that a more frequent examination, more especially late at night, would have revealed the presence of embryos.

So far, then, apart from the presence of the filaria which I am about to describe, there does not appear to have been any distinctive features in the case.

The tumour was about 1 in. in length by about $\frac{3}{4}$ in. in breadth. On making an incision, a greenish, semipurulent-looking fluid about the consistence of cream escaped from the cyst. This, on microscopic examination, was found to contain numerous filarial embryos. The capsule of the cyst consisted of dense fibrous tissue, lined internally by a layer of soft, caseous-looking material, which could be easily scraped off. This was composed of granular material, flat nucleated epithelial cells, and contained free embryos. The interior of the cyst was filled with the adult filariæ, lying in loops twisted up in the most confusing fashion, entering the

Fig. 1.—Head of male filaria.

cyst wall, running along shallow tunnels, and re-entering the cyst. Owing to this and the softness and brittleness of the worm it was a matter of the greatest difficulty to dissect it out, and I found it impossible to do so without breaking it.

Eventually, however, I succeeded in isolating a complete unbroken adult male, and the head, tail, and intermediate fragments of a female. These two worms formed the whole contents of the cyst.

The male worm is much smaller and narrower than the female. Length of one specimen 3.025 cm. (about 1 $\frac{1}{8}$ in.), of the other 3.35 cm. (about 1 $\frac{3}{8}$ in.). It is of a white colour and somewhat flattened in shape, which is, however, probably due to shrivelling from immersion in the preserva-

tive. The chitinous cuticle, which is about 0.018 mm. in thickness, is very distinctly striated throughout, the striations becoming finer as they approach the head and tail. The greatest diameter of the body is 0.44 mm., which is maintained throughout the greater part of its course. There is a gentle and uniform taper to head and tail. The diameter at the head is 0.044 mm.

The head is rounded and not club-shaped (see Fig. 1). The alimentary canal is simple, straight, and opens terminally. The mouth is simple. Other canals can be seen in the body cavity, probably water-vascular and reproductive systems.

The tail is very markedly incurvated. At a distance of 0.040 mm. from the extremity the anal orifice can be seen. Posterior to this the tail is narrow, 0.028 mm.; immediately anterior it measures 0.044 mm.; while just where the incurvature ends the diameter has increased to 0.064 mm.

Fig. 2.—Tail of male filaria.

The extreme end of the tail on the concave side is flattened, and at this point four papillae arranged one behind the other can be seen (see Fig. 2 and Fig. 3). These appear to me to be in pairs, as on careful focussing past them the dim outlines of others can be seen.

The anal orifice itself is seen to have two lateral, one post-anal and one pre-anal papillae. Probably a similar number is to be found on the other side, giving a total of eight anal papillae. From the orifice a spicule projects for a distance of 0.018 mm. The extremity is slightly clubbed, and from there it expands gradually to the inner end, which is trumpet shaped. It has a well-defined double outline, with a narrow central canal, which has a minute opening at the free end. The latter is 0.008 mm. in diameter, and the trumpet-shaped end 0.014 mm., length 0.082 mm. Beginning just within the orifice is another spicule, which is much longer, 0.177 mm., and has much the same shape though narrower at the point, 0.004 mm. Both spicules are incurvated, following the curvature of the tail, and show signs of striation, the larger more markedly so.

The female worm is longer and thicker. The total length of the head, tail, and intermediate fragments, 4.0 cm. or about 16 in. The tail is blunt and slightly curved, but is not incurvated like the male tail. I am unable to make out the opening of the anus. The diameter close to the end is 0.0084 mm., rapidly increasing to 0.36 mm., at which it remains throughout the greater part of the worm, tapering more gradually to the head, where it measures 0.04 mm. The body is striated from end to end, but not so distinctly so as in the male worm; it has a well-marked chitinous cuticle. The alimentary canal is straight. At a distance of 4.35 cm. from the tail, the double uterus, which has throughout a well-defined lining membrane, can be observed commencing in a sacculated extremity. It is here seen to be filled with a number of small, finely granular cells, somewhat elongated, and arranged like columnar epithelium, the base against the walls, the narrow end towards the lumen of the uterus. A little further up they increase in size, are pear-shaped and measure 0.0082 by 0.012 mm.

At a distance of about 14 cm. from the tail signs of differentiation of the ova are first to be seen. They now measure from 0.024 by 0.012 mm. to 0.032 by 0.022 mm. A distinct cell wall can be made out. Still further up the protoplasm has shrunk from the cell wall, and differentiation is more marked. Size 0.036 mm. by 0.028 mm. The cells by this time have lost their pear shape and are more or less rounded. Soon the embryos take on a more definite shape, lying curled up in the cell with clear amniotic fluid separating them from a distinct lining membrane. On staining with logwood the curled-up embryos show minute nuclei. The cells vary in size, and average 0.032 by 0.034 mm.

Following the uterus up, some of the coiled embryos are seen to have ruptured the cell membrane, and to be lying free in the cavity. They gradually uncurl, and finally are to be seen lying packed in rows and interlaced with one another. Development does not proceed at the same rate in both branches of the uterus, as in one branch coiled embryos can be seen, with the other branch lying alongside full of straight embryos. The latter here measure 0.18 to 2 mm. in length by 0.001 in breadth.

Eventually both branches of the uterus are seen to be filled with straight embryos.

The branches of the uterus containing embryos can be traced distinctly to within 1.5 cm. of the head. After this, owing to the clearness of the specimen, they are difficult to follow, and I was unable to make out the vaginal opening. The head is rounded and blunt. The alimentary canal opens terminally.

Embryos.—The free embryos found lying in the cyst measure 0.25 mm. in length by 0.005 to 0.006 mm. in breadth. The head is rounded, but in some cases a double lip may be seen, which, however, is probably due to shrinkage in preparation. The tail is very sharp, with a taper of about one-fifth of the length of the body. A finely granular aggregation is seen running throughout the length of the body, giving the appearance of a canal. On staining with logwood numerous fine nuclei are brought out.

Fig. 3.—Tail of male filaria: a, terminal papillae; b, spicule projecting from anal orifice (c); d, internal spicule.

About the junction of the anterior fifth with the posterior four-fifths, there is a clear spot free from nuclei, evidently the v-shaped spot of Manson. I could not, however, satisfy myself as to this particular shape. The embryo is not sheathed.

The following statement gives, in a tabular form, the characteristics of the embryos of this in comparison with those of the blood worms already known:

	F. Diurna.	F. Nocturna.	F. Perstans.	Present F.
Length ...	0.3 mm.	0.3 mm.	0.23 mm.	0.25 mm.
Breadth ...	0.0075 mm.	0.0075 mm.	0.00455 mm.	0.005 mm.
Sheath	Present	Present	Absent	Absent.
Head	?	Cephalic armature, six-lipped	Papillated	?
Tail	Sharp	Sharp	Truncated	Sharp.
Body	Central granular aggregation	Ill-defined aggregation	No central aggregation	Central granular aggregation.
v spot ...	Present	Present	Absent	Clear spot.

This filaria, then, has certain points of resemblance with *F. nocturna* and *diurna*, but is somewhat smaller, and has no sheath.

So far as I am aware no detailed description of the above filaria has hitherto been published. It differs in several respects from *F. Bancrofti*; but, making allowance for shrinkage consequent on the method of preservation, the geographical facts, the clinical characters of the tumours, and the anatomical features of the embryos concur to make a diagnosis of *filaria volvulus* (Leuckhart) highly probable.

Whether, judging from its superficial position, this filaria completes its cycle by ulceration of the tumour, and sheds its embryos into the outer world in the same way as the Guinea worm, or whether the embryos gain entrance to the blood and follow the usual cycle in the mosquito, are points which require further observation. The former is, in my opinion, unlikely, and when we remember the hundreds of

thousands of embryos which the adult worm is seen to contain, we can understand how even a single worm can give rise to a very marked degree of infection of the blood. The removal of the tumour in this case may have been the cause of the absence of embryos from the blood, and, if such is the case, a very important indication for treatment is given in those cases where the adult is situated superficially in glands or otherwise.

In conclusion, I wish to express my thanks to Professor Hamilton for kindly allowing me the use of the Pathological Laboratory of the Aberdeen University, and to Dr. Manson for several valuable suggestions.

REMARKS ON THE APPARENT IMMUNITY OF ASIATICS FROM ENTERIC FEVER.*

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I wish to direct attention to a subject of considerable interest—namely, the apparent immunity of Asiatics from enteric fever, as shown in the following table:

	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	Total.
Chinese	1	5	—	—	2	10	7	1	9	16	51
Non-Chinese	4	5	—	5	4	5	7	10	14	11	65

During the ten years, 1890-99, only 51 deaths of Chinese from enteric fever were registered as against 65 deaths of non-Chinese, although the Chinese form 94 per cent. of the total population, and in my annual report for the year 1897 I wrote:

It is interesting to note the small number of cases of enteric fever which occurred among the Chinese during the year, an experience which accords with the apparent immunity of the native population of India from this cause, while the circumstances connected with these cases appear to suggest that the same explanation of this apparent immunity may apply to both races—namely, that they are so fully exposed to the infection throughout the whole period of their existence that they almost always contract the disease in infancy or early childhood, when, if they recover, the disease will have been practically unnoticed, while, if they succumb, the death will be attributed to diarrhoea, convulsions, or some other symptom. Should they then happen to contract a second attack in adult life, it will be so modified by the previous one as to be again scarcely recognisable, or at least to be insufficient to drive the patient to a hospital under European control. Of the seven cases which occurred among the Chinese in this colony last year, one only was an adult, and he contracted the disease in Saigon, from which port he arrived by steamer, while the other six were children ranging from 6 to 17 years of age, resident in a home under European management. These children obviously contracted the infection from a German pastor who was brought down to the home from the Tung Kun province of China, in consequence of illness, and died of enteric fever a very few days after arrival; the children had been carefully protected from any infection of this nature while in the home, which means practically from infancy, as the home is a foundling one, until the arrival of this European case, when they showed that they were equally as liable to contract the disease as any European children would have been. And it appears to me, therefore, that we have in the history of these cases a very suggestive corroboration of the theory that the Asiatic is not naturally immune to enteric fever, but that he is almost invariably protected by an attack in infancy.

This report of mine served to draw the attention of Dr. Thomson, the officer in charge of the Government mortuary, to this subject; and in the following year (1898) I was able to report that 3 deaths from enteric fever in Chinese children under 10 years of age had been discovered in the mortuary, while in 1899 7 such deaths were reported.

During the current year, however, the theory has received very strong confirmation, as Dr. Thomson has fortunately been able to devote more time to this research; and, as a result, I find that, while 12 deaths have been registered as due to this disease among the non-Chinese, 22 have been registered among the Chinese, and of these 7 were in infants under 1 year of age, and one a child between the ages of 1 and 5 years. It must be borne in mind that these cases have, moreover, been found amongst the few bodies of infants that are picked up in the streets by the police, and that no *post-mortem* examination is made of the bodies of the 1,500 or more infants that are taken annually to the French and Italian

convents in a moribund condition, and whose deaths are registered as due either to "diarrhoea," "fever, undefined," "marasmus," or "convulsions," and that these convent returns comprise about 75 per cent. of the total deaths in the Colony under 5 years of age.

Speaking of England, Whitelegge says, "It is probable that true enteric fever is rare among infants and young children, and that many of the cases at those ages are due to faulty diagnosis," and it is possible that this may be true of England, where domestic hygiene receives considerably more attention from householders than it does in China or even in Hong Kong. Here, however, it would seem that we have only to look for the disease *post mortem* in order to find its evidences even amongst the smallest of infants. The main sources of infection will no doubt be the contamination of feeding utensils and the custom of keeping excreta within the dwellings for periods of twenty-four hours or more; and until we can educate the Chinese to live more cleanly and healthful lives I am afraid that the disease will flourish among them, and will continue to destroy a large percentage of their infant population.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

PERSONAL PROTECTION AGAINST MOSQUITOS.

BELIEVING it may be of some interest and value to the members of the British Medical Association who have not given it a trial yet, I wish to record my experiences during the last few months in the use of the ordinary kerosene oil (which is sold here at 4½d. a quart) as a simple and inexpensive and reliable means of personal protection against the mosquito. That is readily effected by sprinkling some of it all about the sleeping chamber, or cabin, or bunk, and tying a handkerchief or clean towel nearly saturated on the bedposts, etc., above the head of the occupant, due caution being, of course, taken not to bring a light too near. We have found it a very excellent adjunct to the mosquito net which is generally recommended and used, and may under certain circumstances fairly become a substitute thereof, where in a way somewhat similar to the method of Dr. Stanley Haynes there is no mosquito netting. He, however, used surgical carbolic soap, locally applied to the face, neck, hands, and forearms. I have likewise used a solution of carbolic acid in the same way as above mentioned for kerosene oil, and with great satisfaction. But I prefer the latter agent, because it is not only cheaper but innocuous—an important point amongst an ignorant and careless population, such as we have to treat here: besides, it is fully as effective. I am inclined to believe that the kerosene drives away the mosquitos, owing to its peculiar penetrating odour overstimulating their olfaction, and causing them to flee from the source of the irritation.

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J. A. WEGG, M.D.

VELD SORES.

I SHOULD like to call attention to a few points in the etiology of the so-called veld or Natal sore, which, so far as I can ascertain, is not a settled question amongst the medical profession in South Africa, and to the relation between this affection so prevalent in this country and the horse tick. During the last eight months with the troops in South Africa I have myself made the following observations as to its occurrence:

1. In the cold weather and at high altitudes the horse tick is rarely found, and there is coincident with this a disappearance of veld sores.

2. Veld sores are more common in the cavalry and artillery ranks than in the infantry regiments, in which case they are mainly confined to batmen or grooms.

3. There is, so far as my experience goes, a complete immunity amongst officers, who naturally do not groom their own horses.

4. From the character of the sore it would appear to be of a specific bacterial origin and not a simple ulcer following on

* Read at a meeting of the Hong Kong and China Branch.