NOTES OF THE OCCURRENCE OF PARASITES PRESUMABLY RARE IN MAN.

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The parasitic worms are generally so large and obvious that it would seem very unlikely that forms other than unnatural infections could have remained practically unrecognized. Yet from material that has reached me during the last two or three years it is evident that this is actually the case. Three species of nematodes have now occurred in several small consignments, and one must conclude that they are common parasites in certain localities. To previously published cases, I make the following additions, in the hope that attention may be attracted to the incidence of these relatively unfamiliar forms.

*Physaloptera mordens* Leiper.

This parasite was first described from material received, during a visit to Uganda, from Dr. Grey of the Sleeping Sickness Commission. Further examples have been contributed by Dr. Turner from his post-mortems of negroes dying in the Transvaal. Dr. Macfarlane has just forwarded to me several specimens collected by him from two cases during a recent tour in Portuguese East Africa. The new specimens are notable for their size, one female attaining to a length of two and a half inches. These worms live in the stomach, often in association with *Ascaris lumbricoides*, which they closely resemble. They are readily recognized with a hand lens, for they possess a cuff-like cuticular expansion at the anterior end which almost invariably obscures the lips. When these are visible only two are found, a feature which at once distinguishes the genus *Physaloptera* from the genus *Ascaris*. Moreover, the skin over the whole body is smooth, while in *Ascaris* it is characteristically transversely striated. In the male the cuticle is expanded laterally on either side of the tail, and into these expansions four elongated papillae protrude on either side. There are other, sessile, papillae, but these are difficult to find with

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1 *Journal of the London School of Tropical Medicine*, vol. i, No. 1, pp. 16 to 19 (1911).
a hand lens. The eggs have a shell of thick clear cuticle with a smooth surface. The life-history is unknown, but presumably similar to that of the Ascaridæ.

_Triadontophorus deminutus_ Railliet and Henry.

The original description of this species was based upon two specimens which had lain unidentified for forty years in the Paris Natural History Museum. In 1908 an account of this species was published by me in a note on "The Occurrence of a Rare Sclerosome of Man in Nyassaland," together with a clinical report by Dr. Turner, who had supplied the material. In 1911 I recorded further cases from Dr. Turner, from Dr. Stannus in Nyassaland,
and from the Medical Officer of Lorenço Marques. Since then I have received in 1912 specimens from two cases under Dr. Stannus in Nyassaland, and during the current year a quantity of material from three cases observed by Dr. Macfarlane in Portuguese East Africa.

The parasites are apt to be mistaken for ankylostomes. They often occur in the same cases, and their eggs also are very similar. Triodontophorus has, however, a different habitat from the Ankylostoma. The former lives attached to the wall of the great intestine, the latter occurs only in the small intestine. Structurally the two parasites differ very considerably. The oral capsule in both has a chitinous wall, but in Triodontophorus the orifice is quite terminal, and is guarded by a ring of stout bristles. In Ankylostoma the mouth capsule is always bent dorsally, and the mouth capsule is guarded by bilaterally placed paired teeth.

*Ankylostoma ceylanicum* Looss.

The credit of detecting this worm as a common parasite of cats and dogs, and as an occasional parasite in man, is due to Major Clayton Lane, I.M.S., the first and hitherto only records being made by him in 1913. Workers in China had reported the occurrence of the human ankylostome as an occasional parasite of dogs in Shanghai. During a visit in 1914 I made a detailed examination of a large number of dogs in Shanghai and at Hankow, in the hope of finding *Ankylostoma ceylanicum*. Ankylostome infection of dogs was very common, but the species was invariably *A. caninum*. In a recent letter Dr. Kerr informs me that he has found what appeared to be *A. ceylanicum* in dogs and cats, and in ten to twelve per cent. of the cases examined by him in the prison at Chiangmai, Siam, usually with only one or two worms in each case. The worms from two of these cases were received for identification, and are undoubted examples of this species.

As Major Clayton Lane has already pointed out, the prevalence of a canine ankylostome in man may eventually necessitate a slight readjustment of our views on prophylaxis.

In the latest issue (July 31, 1915) of the *Annals of Tropical Medicine and Parasitology*, Professor Warrington Yorke and Dr. Blacklock publish a brief interim Report on “Ankylostomiasis in dogs in Sierra Leone.” They conclude from an examination of seven dogs at Freetown that ankylostome infection appears to be universal in dogs in Freetown and that one of the two species found is the *Ankylostoma ceylanicum*. They add, “We have had no opportunity
of determining whether *Ancylostoma ceylanicum* occurs in human beings in Sierra Leone." "The importance of ascertaining whether this species occurs in man is obvious. If *Ancylostoma ceylanicum* is found in human beings in Freetown, the dog reservoir of the infection is a factor which must be borne in mind when prophylactic measures are under consideration."

The details given in this paper lead me to doubt the accuracy of the diagnosis of *A. ceylanicum*. The authors compare their presumed *A. ceylanicum* with *A. caninum* and illustrate the main points of contrast with figures reproduced here.

With reference to the dorsal lobe of the bursa, Yorke and Blacklock write: "In the dorsal lobe is the posterior ray, which exhibits slight differences in the two species. In both it is bifurcated in its terminal third and each of the branches is at its extremity tridigitate. It is in the character of these terminal digitations that the slight difference is found. (Figs. 5 and 6, after Yorke and Blacklock.) In both species the two inner digitations are small, being separated by a mere notch."

I append a drawing (fig. 7) from an Indian specimen of *A. ceylanicum*; it will be seen that the dorsal ray has a pair of digitations only on each of its two branches. As this division is of specific importance and occurs in all specimens, it seems unlikely that the West African dog ankylostome is the same species as that recorded above. The drawings of the mouth capsule given by Yorke and Blacklock certainly show a single pair of large chitinous teeth as in *A. ceylanicum*, but the outline is scarcely correct. One is inclined to think that these authors have been dealing with *Uncinaria stenocephala* Railliet, a similar ankylostome often found in association with *A. caninum*.

As regards synonymy a recent article by Gomes de Faria
contributes further anatomical details which tend to show that
*Ankylostoma braziliense* and *A. ceylanicum* are distinct species.

Some attention has already been devoted to ankylostomiasis
in Sierra Leone. Major F. Smith in a paper in the *Journal of the
Royal Army Medical Corps* for 1905 says: "I have not yet
found in Sierra Leone a dog free from ankylostomes" but he does
not indicate that man and the dog in those regions have a species
in common.

*Euparyphium malayanum* Leiper.

This species was described briefly by me in 1912 from poorly
preserved material forwarded by two medical officers in the Malay
States, but derived, as it afterwards appeared, from the same post­
mortem. Later the material was described more fully by Professor
Odhner of Christiania, who has a special claim to authority in this
group.

Dr. Kerr has now sent a single specimen from a case at
Chiengmai with the following comment: "This worm was obtained
as the result of an anthelmintic and is the only one of the kind
I have met with."

A third case would appear to have come recently under the
notice of Dr. E. Smythe, of Suffry, Assam. In the April issue
of the *Indian Journal of Medical Research* for 1915, Major Clayton
Lane describes the specimens under the new and distinctive
name of "Artyfechinostomum sufrartyfex." The flukes had been
vomited and passed by a girl of seven. Although the new species
is placed in a different genus and subfamily of the Echinostomidae,
the great similarity in the descriptions and figures leaves room for
doubt whether the species reported on by Lane is not the same
as that previously described by Odhner and myself.

*Opisthorchis viverrini* Poirier 1886.

In Dr. Kerr's consignment of parasites obtained from prisoners
in the Chiengmai jail was a tube containing three flukes regarding
which the following notes were supplied:—

"*Opisthorchis felineus*? Ova found in about fifteen per cent. of
the faeces examined. The worms were twice obtained post mortem,
in one case a single one from the intestine, in another twelve worms
from the gall-bladder and large bile-ducts. The ova have a small
projection at the distal end to the cap. The worms also differ
from the figures I have of *Opisthorchis felineus* in having a much
longer part of the intestine unbranched, they also seem smaller.
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I was present at a post-mortem by Dr. Mason where thousands of these worms were removed from the liver."

These worms resemble *Opisthorchis felineus* but differ in the following points of specific importance: The skin is covered with

minute acicular spinelets; the ovary is multilobulate; the branches of the gut proceed almost to the extreme posterior end of the body. The ovary and testes fill the last fourth of the body between the gut branches.

The length of the oesophagus is from two to three times that of

Fig. 8.— *Opisthorchis viverrini* Poirier in man.
the pharynx, varying with the degree of contraction of the specimens. The ventral sucker is of about equal size with the oral, if anything occasionally slightly larger (fig. 8).

In 1907 Verdun and Bruyant recorded the occurrence of Opisthorchis felineus in a patient from Hanoi. The skin is stated to be smooth and the ovary round or arcuate.

In a paper entitled "Observations on certain Helminths of Man," published in 1913, I made the following remarks: "Some years ago Dr. Maxwell forwarded to me from Formosa a macerated specimen from the stool of a cat, which shows short spines on the cuticle, but unfortunately the testes had been digested and it was impossible to say more than that the worm was either a Clonorchis or an Opisthorchis. Looss has recently drawn attention to a record by Ijima, in 1886, of the occurrence in the liver of a cat in Japan of a distome, with spines, smaller than C. endemicus." There seems a probability that the parasite now under discussion is the same species as that referred to in the above quotation.

The most nearly related forms in the genus Opisthorchis are O. felineus, O. pseudofelineus, O. noverca and O. viverrini. Identity with the first named can be excluded by the presence of spines and the occurrence of a lobulated ovary; with the second and third species by the lobulation of the ovary and the absence of a backward extension of the yolk glands beyond the receptaculum seminis to the anterior testis. There remains Opisthorchis viverrini. The description of O. viverrini by Poirier omits to give details regarding the skin, but in other respects the account tallies with our own findings. Until O. viverrini is examined more fully I do not think one would be justified in separating these forms. I therefore make a provisional diagnosis of O. viverrini, a parasite found in the Indian civet cat, but not recorded heretofore from man. Infection is probably acquired from the consumption of uncooked or partially cooked freshwater fish.