

A PARASITIC SCOURGE OF WARM CLIMATES.

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IN the interests of preventive medicine it is desirable that the public should become acquainted with a serious but easily preventable parasitic disease which is widely distributed in all hot countries, but has only been recognised within the last few years as existing in Queensland.

The parasite which causes this disease is a minute worm, known to science under the rather cumbrous name of *Anchylostoma duodenale*. There has been, unfortunately, some confusion as to its generic name, and it is also known as *Sclerostoma* or *Dochmius*. All these names refer to the same species of worm. Its habitat is the upper part of the small intestine of the human being, and it lives by sucking the blood of its host in much the same manner as a leech. When present in large numbers—and it sometimes occurs by hundreds or thousands in one individual—it gradually reduces the sufferer to a condition of extreme or fatal bloodlessness.

The *Anchylostoma* was discovered by Dubini, in Milan, in 1838, but it was not till 1854 that Griesinger demonstrated its importance as a cause of disease in Egypt. He found that a condition of anæmia, or bloodlessness, which was very prevalent in Egypt, and was indeed known as “Egyptian chlorosis,” was due to this worm. In 1866, Wucherer discovered the same parasite as a cause of a similar disease in Brazil. Since then the parasite has been discovered in many parts of the world. It is known in Southern Europe, Northern, Eastern and Western Africa, also in India, Assam, Ceylon, the Malay Peninsula, Cochin-China, Tonquin, Japan, Java and Borneo; and in the new world in Brazil, Colombia, Venezuela, Guiana, Peru, Bolivia, the West Indies, and the southern United States. In short, it is probably present in all tropical and sub-tropical countries. In

Europe, at least, it spreads far beyond the tropics, for it is found endemic as far north as Dortmund, in Westphalia, a town in nearly the same latitude as London. Roughly speaking, its northern limit in Europe coincides with that of the cultivation of the vine. I would draw attention to this as indicating that there is nothing in climatic conditions to prevent it from spreading into, if it is not already present in, the southern Australian colonies.

The first record of the occurrence of *Anchylostoma* in Australia was made in 1889, by Dr. Hogg, who found it post-mortem in an inmate of the asylum at Goodna. This remained an isolated observation until March, 1892, when the parasite was re-discovered by Dr. J. Lockhart Gibson and myself, during life in two children from Cairns, admitted into the Children's Hospital for anæmia. These cases are recorded fully in the Transactions of the Intercolonial Medical Congress, held in Sydney during the same year. Since that time many cases have been recorded by ourselves and other observers, from Cairns, Townsville, Mackay, Maryborough, and from various stations on the North Coast line between Brisbane and Gympie, and lately also from the Tweed River, just across the border of New South Wales. So far as is known at present this is its southern limit, but as the disease is one that may easily pass unrecognised, it is quite possible that it may extend further. There is no doubt that this pest has spread throughout the coastal districts of the colony. From the interior no cases have, so far, been reported. In the south of the colony it appears to affect particularly the country districts, for I know of no case originating in Brisbane, though it prevails both to the north and south of this city. Whether it is really indigenous to the colony, or has been introduced, is beyond the reach of direct proof. I hold the latter opinion. When we come to consider the life-history of the parasite, we shall see that it is easily capable of being introduced from infected countries, and of being spread from one locality to another in the same way; and it is probably so spreading at the present time.

The adult *Anchylostoma* is a minute slender worm, from a quarter to half an inch in length. When fresh it is frequently of a pinkish colour, from ingested blood. I do not propose to describe its anatomy in detail on the present occasion. One point must, however, be mentioned as of special importance,

and that is, that it possesses a mouth furnished with horny teeth. With these it clings to the mucous membrane of the human intestine, sucking the blood of its host into a thick muscular-walled pharynx. The quantity of blood extracted by one worm is insignificant, but that taken by hundreds or thousands of worms during the course of months and years becomes very considerable. Under normal conditions the worm never leaves its habitat in the bowel, but once there remains established for many years at least. The female worms discharge an enormous number of minute eggs. These pass from the body of the host by millions; and can be detected by microscopical examination; thus making the recognition of the presence of the parasite an easy matter.

The symptoms manifested by infected individuals are those of gradually progressive anæmia, or want of blood, varying in degree according to the number of parasites present. There is gradually increasing pallor of the face and lips, with gradually increasing weakness, and, in some cases, abdominal pain and digestive disturbance. Usually, except in extreme cases, the patient remains well nourished. This condition of pallor and weakness may last for years without increasing. In other cases the anæmia may progress so far as to be directly fatal; or, more commonly, the already weakened patient is carried off by some intercurrent ailment. In children, who so far have been the most frequent sufferers noted in Queensland, there is one symptom sometimes but not always present, which cannot fail to attract attention. This is a morbid propensity for eating earth, or indeed any kind of dirt. Earth-eating may occur in children who are quite free from *anchylostoma*, but it is of special importance, as we shall see, as exposing them to the risk of continually increasing infection, if they happen to reside in an infested district.

What now is the life-history of this parasite, and how does it come to attack human beings? Our knowledge of its life-history is not yet quite complete, but this much may be taken as fairly certain: Firstly, that the worm does not multiply in the intestine, but that every individual found there has been taken through the mouth from without. Secondly, that the eggs, which are discharged in such myriads, have been observed to develop in damp earth into minute larval worms; and these,

when swallowed, have been observed to develop in the intestine into mature worms. From damp earth to muddy water is not a far step; and in these two we may look for our source of danger. In Europe it has been observed that those most frequently affected are those who are continually handling earth, more particularly brick-makers, those engaged in mining and tunnelling, and agriculturists. In one family which I know of, I was inclined to attribute the infection to drinking the water of a stagnant waterhole situated not far from the house. It is obvious that infected individuals, by distributing the eggs, will carry the parasite from one locality to another.

The rules for the prevention of this serious malady may be formulated under three heads:—

(1.) *Cleanliness in eating*.—To eat with unwashed hands is dangerous, particularly to all who work on the soil in country districts. Children addicted to earth-eating must be broken off the habit at any cost; nothing but constant watchfulness will do this. In an infested district the habit, if unchecked, will almost certainly lead to early death.

(2.) *Carefulness as to drinking-water*.—Water in iron tanks above ground is not likely to become infected. Underground tanks and waterholes may harbour the parasite. If the water supply is doubtful, any simple form of filtration would probably render the water harmless as regards *anchylostoma*. Boiling the water is a certain preventive.

(3.) *The treatment of affected individuals*.—The parasite can be effectually expelled by suitable medical treatment. Every individual harbouring the parasite is a source of danger to others, and should be cured for their sake as well as his own.

COMPARATIVE GRAMMAR AND VOCABULARY OF THE YÖGUM AND YAGGARA LANGUAGES.

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