

ABSTRACTS OF OFFICIAL PUBLICATIONS, ETC.

Many investigations relating to Hygiene and Public Health, possessing permanent scientific value, appear in Annual Reports of Medical Officers of Health, Blue Books and other Publications of Official Bodies within the British Empire. These are not easily available and as a rule no record of them appears in scientific journals or in an accessible form; consequently much valuable work is lost sight of. To obviate this difficulty the Editors of the "Journal of Hygiene" propose to publish from time to time abstracts of such publications, or parts of them, as appear of sufficient permanent interest. They will be glad to receive copies of official Reports coming under the above description.

THE CAMPAIGN AGAINST ANKYLOSTOMIASIS IN PORTO RICO¹.

THE existence of ankylostomiasis as one of the most potent causes of ill-health in Porto Rico was first pointed out by Ashford in 1899. The Commission subsequently appointed in 1904 showed² that the disease was very frequent and that the prevalent anaemia of the working population was due entirely to *Ankylostoma*, the commonly accepted factors of insufficient and improper food, etc. being negligible. The poorer classes, mostly employed on coffee plantations, are strangers alike to latrines and to boots. The moist warm soil is thoroughly saturated with faeces in the neighbourhood of the houses and would appear to swarm with *Ankylostoma* larvae. In practically every case infection is indicated by an attack of dermatitis of varying severity, usually on the feet, known as "mazamorra" and popularly associated with the subsequent anaemia in a causal relation. Only 4·2 per cent.

¹ Preliminary Report of the Commission for the Suppression of Ankylostomiasis in Porto Rico, by P. G. Igaravidez, W. W. King and B. K. Ashford. San Juan, Dec. 31st, 1905.

² Anemia in Porto Rico. San Juan, December 1904.

of over 18,000 cases denied having suffered from "mazamorra." About 90 per cent. of the country people are infected, and constantly recurring re-infections reduce many of them to an extreme stage of the disease. It appears indeed that about half the workers in country districts have only 50 per cent. or less of haemoglobin. The incidence in the urban population is, of course, much less.

The relative racial immunity of coloured persons is confirmed: 71 per cent. of 14,560 whites suffered from a degree of disease classified as "medium," "intense" or "very intense," while 54 per cent. of 3,278 mulattos and 41 per cent. of 670 negroes fall in the same categories. The negroes on the other hand were infected just as heavily as the whites. Thus 78 per cent. of the whites had "moderate," "many," or "very many" ova in their stools, 72 per cent. of mulattos and 76 per cent. of negroes¹.

Having established the overwhelming importance of *Ankylostoma* as a factor in industrial efficiency, the Commission in 1904 treated 5,490 cases with thymol, partly in hospital but mostly as dispensary out-patients. Of these 48 per cent. were cured, 31 per cent. improved, and 0.5 per cent. died, while 19 per cent. were lost sight of. With such encouraging results, an effort was made in 1905 to carry out the treatment on a larger scale: the results are embodied in the present report.

A central station, including a tent hospital of 60 beds, was established at Aibonito, and subsequently ten sub-stations were started in different parts of the island. Patients attended in large numbers, had their stools examined and received treatment, together with instructions as to the nature of the disease and as to the necessity of constructing latrines at their homes. On subsequent visits the effect of treatment was estimated by repeated examinations of the stools and the general progress of the patient noted. The hospital beds were reserved for the most severe cases or those coming from a long distance.

Of 19,351 persons who presented themselves for examination during the six months June to November 1905, *Ankylostoma* eggs were found in the stools of 18,865 (97 per cent.) who made in all 76,410 visits to the dispensaries. 69 per cent. were suffering from a degree of the disease varying from "moderate" to "very intense." As a result of

¹ This conclusion is not altogether justified: for while 35 per cent. of whites and 31 per cent. of mulattos are classified as having "many" or "very many" eggs, only 23 per cent. of the negroes fall under these headings. Assuming that there is no difference in habits these figures indicate that the negro is less subject to infection roughly in proportion as he is less subject to illness.

treatment, 84 per cent. were cured, and only 67 (= 0.35 %) died, mostly from other causes complicated by severe ankylostomiasis.

Mode of treatment. Two preparations of male fern—one German the other American—were tried and found altogether useless, although given in amounts sufficient to produce general toxic symptoms. Careful comparisons were made between thymol and beta-naphthol. In hospital cases, which were prepared for 24 hours by a strict milk diet before taking the anthelmintic, the efficacies of the two drugs seem about equal: thus the averages of a number of cases show that one dosing (*i.e.* two half-drachm doses) of thymol expelled 77 per cent. of worms, and one dosing of beta-naphthol 72 per cent. while the effects of 4 doses were 97 per cent. and 96.5 per cent. respectively. With out-patients, however, who usually failed to alter their diet and simply took the drug given to them, thymol gave far better results. This is somewhat disappointing in relation to wholesale treatment, since beta-naphthol is only one-fifth the price of thymol. Repeated doses were, as always, found to be necessary: 12 per cent. were cured with one dose, 55 per cent with four, and 94 per cent. with ten. Generally, the authors conclude, five doses of thymol are sufficient to practically cure a patient, *i.e.* to turn him from a sick to a well man and to reduce his power to infect the soil afresh by about nineteen-twentieths. In places such as Porto Rico, where the whole surface of the earth is more or less infectious, the immediate object aimed at is to restore the working capacity of the individual. This is frequently effected by the evacuation of a majority only of the parasites, the person then becoming a "worm carrier" instead of a patient suffering from ankylostomiasis. Incidentally his infectivity is always much reduced and in a majority of cases abolished. In Western Europe, where the places already infected and capable of becoming infected are strictly limited in kind and area, the desirability of enabling the patient to work is to some extent overshadowed by the much more difficult task of rendering him innocuous as a possible carrier of infection to other places.

Cost. One of the most striking items in the present report is the financial statement which brings it to a conclusion. Excluding two members of the Commission, most of the laboratory equipment and much assistance at the sub-stations rendered gratuitously by the local medical men, the total cost during six months of treating nearly 19,000 persons and of restoring 16,000 of them to an active working life, amounted to only a little over £2,000, of which drugs account for £420.

The Commission estimate that for an expenditure of £20,000 per annum it would be possible, without any further gratuitous services, to treat 100,000 persons a year: this is one-tenth of the total population of Porto Rico and one-eighth of the estimated total of infected persons.

The results already obtained in Porto Rico are sufficient to show that the treatment of ankylostomiasis on a large scale is within the range of practical hygiene. It is very desirable that similar work should be undertaken in other places, such as parts of the Indian Empire and the West Indies, where *Ankylostoma* is a prime factor in the production of illness and inefficiency in industrial communities.