

way, but were also taught hygiene, and this had a great effect for good on themselves and the families they belonged to.

Scholarships: Last year four of the brightest boys had been sent to St. Stephen's College at Auckland. Also five boys had been sent last year to Wellington to be taught trades. This year more boys were being sent to the college. The only artisans at the islands were French Tahitians, to whom the Rarotongans object. The boys were under bond to return to the islands on the expiry of their apprenticeship. The Administration helped the parents in poor circumstances by paying for outfits and for fares to Wellington. The money the lads earn was generally sufficient to pay for their keep whilst away from home. They were under the control of the Young Men's Christian Association, at whose rooms they boarded. Five more boys were going up this year.

Economic Help to the Natives.—The Administration had also purchased orange-trees and distributed them amongst the Natives at half-price. After several attempts the panama-hat plant had been successfully introduced by the Administration.

Whaling was an industry that would repay careful attention, for whales were very plentiful about the islands. Steps were being taken to send some of the Natives to the Queen Charlotte Sound fisheries to learn the most up-to-date methods of whale-fishing.

Bank for the Islands.—There was great necessity for a banking institution of some kind in the islands. Both the Bank of New Zealand and the National Bank had been asked to open a branch there, but without success. Steps were now being taken to establish a rural bank. Arrangements for its formation had already been completed. In fact, a request had been made for two rural banks. The capital of each bank would be £1,000. It was considered that such an institution would be a great boon, as it would enable the Natives to obtain advances to buy seed, &c., and to clear and plant their lands. Money would be advanced on the security of chattels and crops, but the principal form of security would be the personal bond of the borrower and two of his friends.

Difficulties of Administration.—Lack of regular communication between the different islands was very troublesome and did not make for good administration. Had it not been for the courtesy of the London Missionary Society in allowing him to travel by their steamer the Commissioner and other officials would not have been able to get round the Group. There were but three trading schooners in the islands, all privately owned and under no control whatever as to sailings or freights. An independent schooner was badly needed that would visit each island in turn at regular intervals. It would be invaluable to officials as well as to the Natives.

THE MOSQUITO AND OTHER PESTS IN RELATION TO DISEASE IN THE TROPICS.

EXTRACTS FROM ADDRESS DELIVERED BY DR. H. CHESSEON, ON S.S. "MOKOIA," 22ND FEBRUARY, 1920.

Tropical diseases are many, but for the object of the present lecture it is proposed to deal only with those with which we are specially concerned on this trip as bearing on practical administration of public health in the South Pacific islands. The diseases which will be referred to are Filariasis and Elephantiasis, Ankylostomiasis (hook-worm disease), Leprosy, Trachoma, Yaws, &c.

Fortunately malaria is not common in our islands, though it occurs in islands farther north and west. Cases of malaria do exist, but probably it will be found that in most instances they have contracted the infection in other countries. But should the particular mosquito that spreads this disease be imported, this is a danger we may have to face.

The Mosquito.—Insects play an important part in the propagation of tropical diseases, especially the mosquito, which is a grave danger to health in both European and Native. There are several varieties of this insect, the principal of which from our point of view are—

- (1.) The Anopheles, which carries the parasite producing malaria, which in the mosquito undergoes certain phases of its life-cycle;
- (2.) The various varieties of Culex, which serve as hosts and carry the filaria worm; and
- (3.) The Stegomyia, which carries the yellow-fever organism and also filaria.

Each variety has its own peculiarities, but they all have the same general practical characteristics—namely, they all breed in stagnant water, they do not travel great distances though they spread in undergrowth, and they are all potential sources of danger to humans. The female mosquito lays its eggs in stagnant water, swamps, pools, puddles, flower-pots, vases, or anywhere where water collects. The next stage is the larval state, and in all varieties the larvæ float just beneath the surface of the water with the extremity of the breathing-apparatus just afloat. In this condition it requires air, as also in the pupa stage, in which it also floats just beneath the surface and breathes through its tubes. A thin film of oil on the surface prevents the insects in these stages from breathing, and death ensues. This, therefore, is one method of dealing with the pest, but it is not quite reliable, as the larvæ may be protected by growths of weed preventing the oil from covering the spot where they rest, or wind may prevent the oil spreading; also, the oil requires to be sprayed over the surface every week or thereabouts. The only effective method, therefore, is to efficiently drain all swamps, waterholes, &c., in the neighbourhood of habitations; to clear all undergrowth, leaving only scattered clumps of trees for shade purposes; and to protect all habitations by means of wire screens, seeing that all openings—not only doors and windows—are protected.

At Klang and Port Swettenham, in the Malay States, anti-mosquito measures reduced the cases of malaria admitted to hospitals from 610 in 1901 to 23 in 1905, while cases in the surrounding districts where no anti-mosquito measures were taken were 197 in 1901 and 353 in 1905. It is obviously our duty to take similar steps in the islands under our care, for, though practically no malaria exists there, there are other diseases due to the mosquito which necessitates the destruction of the pest so that they may at least be reduced to a minimum.