stances (molluscicides) and by measures which will make the environments of the snails unfavourable (clearing of vegetation, etc.). (3) Education of the people in the life-history of the parasite and the mode of infection, and in the need for better methods of disposal of their excreta.

Much research is needed on molluscicides and on methods of applying them, and on the habits and biology of the species of snail involved. Investigation of methods of treating infected people and on drugs suitable for this purpose is also necessary. Unfortunately the drugs so far discovered that will kill the adult trematodes in the blood vessels are compounds of arsenic or antimony, which may have serious effects on the patients treated

with them. The World Health Organization* is also sponsoring work on this disease, and Prof. George MacDonald has given up his directorship of the Ross Institute of the London School of Tropical Medicine and Hygiene to lead a team based at Makerere Medical School, Kampala, Nigeria, which will work on schistosomiasis. In 1961 the Rockefeller Foundation gave a grant of 142,500 dollars to aid this work. The team will work in co-operation with the staff of the East African Medical Research Council on the disease in Africans in the area of Lake Victoria.

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* WHO Technical Report Series, No. 299 (price 5s., from H.M.S.O., P.O. Box 569, London, S.E.1) and *Snail Control in the Prevention of Bilharziasis* (price 30s., from the same address).

HYDATID DISEASE

A NUMBER of publications recently issued by the National Hydatids Council of New Zealand will be of interest to anyone concerned with public health.

One of these, entitled *Hydatid Disease in New Zealand**, describes the events which led to the establishment of the National Hydatids Council. It gives statistics about the prevalence of the hydatid tapeworm in New Zealand dogs and the incidence of hydatid cysts, which are the larval (bladderworm) stages of this tapeworm, in cattle, sheep, pigs and man, together with figures of the incidence of the cysts of another tapeworm of the dog, *Taenia hydatigena*. It has been estimated that hydatid disease is more common in New Zealand than in any other country, and that as a cause of death it is three times more prevalent in New Zealand than in Australia and twenty times more than in England and Wales. It is five times more prevalent in Maoris than in Europeans, and at the present time more than 20,000 New Zealanders may be infected with hydatid cysts. This is ascribed to the fact that the range and degree of moisture in New Zealand favour the survival of the eggs of the tapeworm after they have been passed out of the dog in its excreta. Pertinent is the fact that New Zealand farmers feed their dogs on uncooked offal containing the hydatid cysts, from which the adult tapeworms develop in the food canal of the dog. The pamphlet also describes early and subsequent attempts at control of the infection in man. It discusses methods of educating the public in the ways in which infection with hydatid cysts may be acquired, spread of knowledge of this kind and its effects, the general awakening of public conscience about the disease, and the formation of the National Hydatids Council.

The function of the Council is to exercise central control of measures used for the eradication of the tapeworm and of the disease caused by its hydatid cysts. It is now an offence to fail to register a dog or to bring it to one of the control centres for dosing with a drug that will kill the tapeworm. Furthermore, it is illegal to feed a dog on raw offal or to allow it to have access to such. As a result, the infection of dogs with the hydatid tapeworm has been reduced in about seven-eighths of New Zealand to 2 per cent, and in half the country to 1 per cent or less. Control of *T. hydatigena* has been less satisfactory, but there has been a considerable reduction of the rate of infection of dogs with this species. It is, however, hoped that it will be controlled by the measures taken to eradicate *E. granulosus*—the life histories of these two species being similar.

Further information about the work of the National Hydatids Council is given in the fifth annual report and statement of accounts of the Council for the year ended

March 31, 1965†. The Council has also issued a valuable pamphlet entitled *Hydatids Eradication in Iceland*‡, which describes the remarkable achievement of that country, in which, during 1860–70, some 15,000–20,000 dogs heavily infected with *E. granulosus* were kept by a total population of 70,000 people, most of whom were sheep farmers living under relatively primitive conditions. In 1840 the Chief Medical Officer estimated that one person in every seven was infected with hydatid cysts. Later evidence showed that one in every four or five was infected. Methods used to control the disease included: (1) education of the public in the life history of the tapeworm and the parts played in it by man, dog and sheep; (2) taxation of dogs in order to limit their numbers—at present there is a tax of £7 10s. on each pet dog and 15s. on each working dog, and in some towns the local authorities are empowered to forbid the keeping of dogs; (3) compulsory annual treatment of all dogs with an anti-tapeworm drug at special centres; (4) enforcement of the law of 1890 forbidding the feeding of dogs on any entrails of sheep or cattle and enacting the deep burial or burning of the internal organs of sheep infected with hydatids; (5) improvements in the general hygiene of the people and in certain farm practices likely to favour the infection of man with the cysts.

A table demonstrates the dramatic decline in the incidence of human infections with hydatid cysts that followed these energetic measures. In 1904 it was possible to conclude that hydatid disease was practically extinct in Iceland and there was a corresponding decrease in the incidence of the cysts in sheep and also of the tapeworm dogs. Although *E. granulosus* and its hydatid cysts thus appear to have been eradicated from man in Iceland, *T. hydatigena* and its cysts in sheep have not been eradicated; however, their incidence has been reduced.

For readers who are not parasitologists but who require a clear and accurate account of the structure and life history of the hydatid tapeworm *E. granulosus*, the National Hydatids Council has issued a publication entitled *Parasitic Animals, with Special Reference to Hydatid Disease*§. It is well illustrated and gives an excellent account of the characteristics and life history of *E. granulosus*. Also dealt with are the relationship of this parasite with other tapeworms and the epidemiology of hydatid disease, its incidence in New Zealand and the measures designed to prevent this disease. Another table gives a comparison of the appearance, lengths and hosts of the seven species of tapeworms found in dogs in New Zealand.

G. LAPAGE

† National Hydatids Council, Wellington, New Zealand. Fifth Annual Report and Statement of Accounts, year ended 31st March, 1965. Pp. 40. (Wellington: The National Hydatids Council, 1965.)

‡ Information Bulletin No. 15: *Hydatids Eradication in Iceland*. Pp. 11. (Wellington: The National Hydatids Council, 1965.)

§ *Parasitic Animals, with Special Reference to Hydatid Disease and its Prevention*. (Reprinted from *Biology for Sixth Forms*. Teach and Test Publications, Ltd., Otahuhu, New Zealand.) R. M. Miller and B. M. B. Harris. Pp. 36. (Wellington: The National Hydatids Council 1965.)

* *Hydatid Disease in New Zealand: An Account of the Events leading to the Establishment of the National Hydatids Council, and the Methods adopted to eradicate the Disease*. By F. S. Maclean. Pp. 48. (Wellington: The National Hydatids Council, 1965.)