siderable area and thickness would be unique, the only known parallel being the small ice shelf off the north coast of Ellesmere Island in the arctic. Accordingly, we have taken samples of vertebrae and flesh from the newly found fish for carbon-14 dating, together with several specimens for taxonomic identification. The tentative radiocarbon date appears to be up to 1100 years (*3*, *4*).

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3. Arrangements for radiocarbon dating were kindly made by F. A. McNeill, Scientific leader, New Zealand Antarctic Research Expedition. Dating was accomplished through the assistance of Dr. T. A. Rafter, director, Institute of Nuclear Sciences, Lower Hutt, New Zealand.
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New Approach to Immunization against Schistosoma japonicum

Abstract. Previous inoculation of rhesus monkeys with cercariae of the nonhuman strain of *Schistosoma japonicum* proved to give a rather strong protection against a subsequent challenge with its human strain.

Investigators (*1*) have indicated that no definite resistance to second infection in schistosomiasis is present until the worms causing the primary infection have matured. It is probable, therefore, that the most important immunizing antigens are connected with schistosome eggs in the host. As the essential role in pathogenesis of schistosomiasis is ascribed to the parasite's eggs, it is regrettable to think that the immunity in schistosomiasis was produced by the reactions of an enormous number of detrimental eggs in the host's essential organs.

We have reported (*2*) that in *Schistosoma japonicum* there is a nonhuman strain which will naturally terminate its infection in the schistosomula stage in man, producing no important harmful effect during the course of infection. It will be of interest to investigate whether inoculations of the nonhuman strain of *S. japonicum* will produce immunity against the infection of its human strain. Also, it has been reported (*3*) that the rhesus monkey, *Macaca mulatta,* like man, is not susceptible to infection of the nonhuman strain of *Schistosoma japonicum,* although it is susceptible to the infection of the other human strains. Thus an immunization study was considered possible in rhesus monkeys without using human volunteers.

In our experiments, the Formosan strain of *S. japonicum* was used as the nonhuman strain and the Japanese strain as a human strain. Eleven monkeys were first inoculated by the cutaneous route with cercariae of the Formosan strain and then challenged with cercariae of the Japanese strain. Four monkeys were used as control animals which were inoculated only with the Japanese strain. While the number of cercariae of the Formosan strain given to each monkey varied, the number of the cercariae of the Japanese strain was always 200 males and 200 females for each monkey. Beginning from the 30th day of infection, the stools of each monkey were examined daily by the sedimentation method. After schistosome eggs were found in the stool, daily egg counts were followed for the entire patent period. As the maximum number of eggs per gram of stool per day during the patent period and the mean number of eggs of the first 30 days usually represent satisfactorily the intensity of infection of nonimmunized and immunized rhesus monkeys infected with *S. japonicum,* they were used as bases for the comparison in this paper (Table 1).

Table 1. Number of eggs of *Schistosoma japonicum* in the stools of immunized and nonimmunized monkeys.

Monkey No.	Inoculation					Eggs/gram per stool/day	
	Immunizing		Challenge				
	No.	Cercariae (No.)	Cercariae (No.)	Days after immunizing inoculation		Maximum	Mean, first 30 days
				1st	Last		
			Immunized monkeys				
9	2	3,400	400	41	14	58	4
10	2	3,073	400	39	21	18	4
1	3	1,800	400	283	14	0	0
8	3	2,000	400	41	14	1,634	308
11	3	2,000	400	41	14	130	25
49	3	5,000	400	74	31	146	45
42	4	9,000	400	141	30	36	8
14	5	5,600	400	67	4	450	57
15	5	5,450	400	67	4	548	58
13	7	12,515	400	261	31	624	140
5	8	3,600	400	148	21	616	114
			Nonimmunized monkeys				
32			400			14,790	1,220
31			400			21,840	4,712
30			400			69,120	6,693
55			400			88,400	46,036

In the immunized monkeys, the maximum number of eggs per gram of stool per day in the patent period varied from 0 to 1634, while in the nonimmunized it varied from 14,790 to 88,400. The mean number of eggs of the first 30 days of the patent period in the immunized monkeys varied from 0 to 308, while in the nonimmunized monkeys the difference was from 1220 to 46,035. From these results, it can be concluded that previous inoculations of rhesus monkeys with the cercariae of the nonhuman strain of *S. japonicum* gave a rather strong protection against a subsequent challenge with its human strain. It is hoped that, by a proper adjustment of the timing, dosage, and number of inoculations of the immunizing cercariae, a state of absolute resistance to the challenge infection might be reached. The immunization procedure introduced here may hopefully lead to the development of an effective way to combat schistosomiasis japonica (*4*).

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