6904

Louping Ill in Man.

THOMAS M. RIVERS AND F. F. SCHWENTKER.

From the Hospital of the Rockefeller Institute for Medical Research.

Inasmuch as louping ill,[1, 2] a natural disease of sheep, can be transmitted to monkeys[3] and mice,[4] and since the disease in these hosts in certain respects resembles poliomyelitis, we procured some of the virus for investigation. After we had been working with the active agent for 5 months, some of it was supplied to another laboratory in the Institute in which after a short time 3 of the workers, one after another, became sick. Two of the individuals developed what seemed to be influenza. In each instance this illness in the patient was followed by apparent health lasting a few days which in turn was followed by a definite encephalitis. The spinal fluids were sterile and showed a mononuclear pleocytosis and an increased amount of globulin. The third patient had what seemed to be influenza without symptoms of involvement of the central nervous system. Inquiry disclosed the fact that an English investigator also had an encephalitis more than a year ago after having worked with louping ill. In this case the spinal fluid also was sterile and showed an increased amount of globulin and a mononuclear pleocytosis. All of the patients made rapid and complete recoveries.

There is no record in the literature of the occurrence of louping ill in man, yet the disease was considered in connection with our cases and attempts to demonstrate the virus in the blood and spinal fluid of 2 of them were made without success. Failure to demonstrate the virus under such conditions, however, was not considered proof that the patients had not had louping ill. Consequently, inasmuch as we had developed a test[5] for the presence of neutralizing antibodies in the sera of monkeys immune to louping ill, we decided to apply the test to the sera of the 4 individuals who were suspected of having had the disease. In addition to these sera, we also tested the sera of other people working with the virus, as

[1] Greig, J. R., Brownlee, A., Wilson, D. R., and Gordon, W. S., *Vet. Record*, 1931, **11**, 325.

[2] Pool, W. A., *Vet. J.*, 1931, **87**, 177, 239.

[3] Hurst, E. W., *J. Comp. Path. and Therap.*, 1931, **44**, 231.

[4] Allston, J. M., and Gibson, H. J., *Brit. J. Exp. Path.*, 1931, **12**, 82.

[5] Schwentker, F. F., Rivers, T. M., and Finkelstein, M. H., *J. Exp. Med.*, 1933, **57**, 955.

well as the sera of a number of individuals who had had no known contact with the active agent.

Seventy-seven satisfactory tests have been made on the sera of 60 individuals. The sera from the 4 patients and 1 laboratory worker, actively engaged in the investigations, definitely neutralized the virus of louping ill. Tests on the sera of these 5 individuals were repeated several times and from all, except one, 2 specimens of sera were examined. The worker not listed as a patient was not sufficiently sick at any time to remain away from the laboratory after the introduction of the virus. Sera from 10 active laboratory workers or helpers who probably came in contact with the virus contained no demonstrable neutralizing antibodies for the virus. Sera from 4 South Americans, 4 Chinese, 5 Negroes in Baltimore, 1 Australian, and 25 individuals of New York City who were either normal, convalescent from acute infectious diseases, or affected with chronic maladies also contained no demonstrable neutralizing antibodies for the virus. One serum from a Negro with obesity and pulmonary edema and one serum from a patient with nephritis yielded questionable results and are still under investigation. The sera tested were collected from both sexes and from individuals 1 year to 68 years old. The average age was approximately 30 to 40.

Of the 60 individuals investigated, 15 might have had contact with the virus. Of these 15, 5, all of whom had been in close contact with the inciting agent, possess sera that definitely neutralize the virus of louping ill. Of the 5, 3 had had encephalitis, 1 had been sick with an influenza-like disease, and 1 had not been consciously ill after initiation of work with the virus. Of the 45 people without histories of contact with the virus, 2 possess sera that give questionable results and are still being studied. The results of our work cannot be taken as proof that man is susceptible to louping ill, but they are sufficiently suggestive to warrant the recording of them in order that workers handling the virus may take precautions to protect themselves. Our findings do indicate, however, that individuals who come in close contact with the virus of louping ill may develop in their sera neutralizing antibodies against the active agent.