tempts to recover the virus from the circulating blood of 3 persons during the first 24 hours after vaccination were unsuccessful.

The production of immunity. Sera were obtained from the vaccinated persons before vaccination and at approximately weekly intervals thereafter, and were tested by the intraperitoneal protection test in mice (Sawyer and Lloyd[4]). All sera were without protective power before vaccination, but in every case protective power against yellow fever virus was demonstrated later. In one case protection appeared for the first time 7 days after vaccination; in two cases 9 days after; in 6 cases 12 to 14 days after; and in one case 21 days after. Sera from 7 persons were tested also in monkeys and gave protection.

5726

Cultivation of the Virus of the Common Cold in Tissue Medium.

A. R. DOCHEZ, KATHERINE C. MILLS AND YALE KNEELAND, JR.

From the Department of Medicine, College of Physicians and Surgeons, and the Presbyterian Hospital, New York.

In a previous report[1] we presented evidence of the cultivation of the virus of the common cold in tissue medium *in vitro*. A single culture was maintained for 15 generations representing duration of life outside the human body of 74 days.

We now report a second cultivation of the virus of the common cold by a technic similar to the one previously described. Naso pharyngeal washings were obtained from a patient within the first 24 hours of a typical acute cold. These were passed through a Seitz filter, the activity of the filtrate ascertained by the intranasal inoculation of apes, and it was planted without concentration in the medium previously described. In this series bouillon made from the special peptone of Dubos was used as diluent instead of Tyrode's solution. The culture was carried under vaseline seal for 17 generations. The total duration of life outside the human body was 73 days. The final dilution of the original material was 1-100 quadrillion.

The average time of transfer varied from 3 days to 6 days. The

[4] Sawyer, W. A., and Lloyd, W., *J. Exp. Med.*, 1931, **54**, 533.

[1] Dochez, A. R., Mills, Katherine C., and Kneeland, Yale, Jr., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 513.

fourth and fifth generations were tested for activity on apes. No infection resulted. The 17th generation representing a dilution of the original material of 1-100 quadrillion was tested for activity on 3 human volunteers. The volunteers were rigidly quarantined under the supervision of an experienced nurse according to the technic previously described. Two volunteers, 3 days after isolation, and one 7 days after isolation received intranasally uninoculated culture medium prepared in the same manner as the medium used for cultivation of the virus and incubated for a similar period of time. Aside from very slight temporary irritation no symptoms of infection resulted from the control inoculations. The appearance of the throats remained unchanged.

Nine days after isolation volunteer No. 1 received into each nares 1.5 cc. of virus tissue culture centrifugalized slowly to remove tissue clumps. Immediately afterwards he was turned on his face for one minute to prevent too rapid swallowing of the material. No symptoms of infection resulted. However, by the second day after inoculation the appearance of the throat had changed, the mucous membrane appearing slightly swollen, somewhat redder than normal and with some swelling of the lymphoid follicles. We have frequently observed this change in the throats of inoculated individuals when definite symptoms of infection have been absent. In spite of these slight changes the result has been considered negative.

Volunteer No. II received 11 days after isolation 1.5 cc. of tissue culture medium into each nares according to the technic employed above. Two days after inoculation the patient awoke with a sore congested feeling in the frontal region, no coughing or sneezing. A few hours later, he vomited, felt listless and suffered from loss of appetite. There was increased redness of the throat, swelling of the lymphoid follicles and a small white patch on the left tonsil. There was a voluminous thin mucous discharge from the posterior naso pharynx. There was no fever. On the next day symptoms of respiratory irritation were absent. However, the objective changes in the throat persisted up to the time of discharge from quarantine 6 days after inoculation. This volunteer experienced a mild experimental cold.

Volunteer No. III was inoculated, in the manner described, 5 days after isolation. One day after inoculation there was slight sneezing. The next day he awoke with nasal obstruction and a mucoid discharge from the nose. Thick mucus was cleared from the throat. He complained of a "splitting headache", the throat showed definite increased redness and swelling of the lymphoid follicles. He grew

worse during the day and vomited his lunch. The eyes became suffused. The third day after inoculation he felt worse and seemed to have infection of the right maxillary antrum. There was post nasal discharge, the throat was redder and the headache persisted though of lessened intensity. The fifth day he was better though somewhat listless. He coughed during the night and raised a good deal of phlegm during the day. There was still nasal obstruction, a slight headache and a mucoid discharge from the nose. He was discharged on the seventh day after inoculation, feeling better. The headache had disappeared. There was still nasal obstruction shifting from side to side, cough and expectoration. The pharynx was still red and swollen. This volunteer suffered from an experimental cold of moderate severity.

Of the 3 volunteers inoculated with the 17th generation of a tissue medium culture of the virus of the common cold 2 exhibited positive results, one experiencing a cold with mild manifestations and the other a cold with moderately severe symptoms. The third with the exception of slight changes in the throat gave a negative result. These experiments confirm the evidence of the cultivation of the virus of the common cold in tissue medium previously reported.

5727

The Depression of the Vomiting Mechanism by Digitalis.

HARRY GOLD, NATHAN KWIT AND JANET TRAVELL.

From the Department of Pharmacology, Cornell University Medical College.

The vomiting produced by toxic doses of the digitalis bodies has been studied chiefly from the point of view of its mechanism and the conditions under which such vomiting occurs. Some time ago the fact was noted that in some instances toxic doses of digitalis which at first caused vomiting, when repeated, failed to cause emesis. The present experiments were planned to extend this observation and to determine under what circumstances the digitalis bodies might produce a depression of the vomiting mechanism.

Observations were made on cats and dogs following the repeated intravenous injection of various members of the digitalis group. Each experiment lasted several days, and in the series of dogs some of the changes produced in the heart by the drug were recorded by frequent electrocardiograms.