4773

Effect of Cysteine on the Survival of Vaccine Virus.

PERRIN H. LONG AND PETER K. OLITSKY.

From the Laboratories of the Rockefeller Institute for Medical Research, New York City.

It is well known that ultramicroscopic viruses rapidly lose their power to infect when kept at 37° C., and become wholly inactive in a few days. If the viruses, however, are placed under anaerobic conditions, they maintain activity for a longer period of time.

The following experiments were made with neurovaccine virus for the purpose of noting the effects of an active reducing agent, cysteine hydrochloride.

The virus was derived from infected rabbits' testicles and suspensions of the tissue were prepared in Ringer's solution, distilled water, and veal-infusion broth, the final dilutions being 1:50. Twenty tubes each containing 10 cc. of the respective suspensions were prepared and to each was added sufficient cysteine hydrochloride adjusted to pH = 7.5 to make a 1:2,000 dilution of the chemical. A similar series of tubes without cysteine completed the series. All tubes were sealed with petrolatum and kept at 37° C.

After 7, 14, 21, 32, 42, 54, and 83 days, the material was tested for activity by the inoculation of different dilutions into the shaved skin of rabbits. The effect of the cysteine on the survival of the virus is shown in the table:

TABLE I.

Material plus virus	7 days	14 days	21 days	32 days	42 days	54 days	83 days
Ringer's solution	1:50±	—	—	—	—	—	—
Ringer's solution + cysteine	1:50,000	1:500,000	1:500,000	1:500,000	1:500,000	—	—
Distilled water	1:50?	—	—	—	—	—	—
Distilled water + cysteine	1:50,000	1:500±	1:50,000±	1:500,000	1:50	1:50±	—
Broth	1:50	1:50	—	—	—	—	—
Broth + cysteine	1:5,000	1:50	No record	1:500	1:500	1:5,000±	1:500

± = mild reaction; — = no reaction; ? = doubtful reaction, and the numbers represent the highest dilution in which infectivity was noted. The virus by itself was immediately active in 1:100,000,000 dilution at the time of preparation.

It follows, therefore, that cysteine hydrochloride definitely favors the survival of vaccine virus at 37° C., and the broth vehicle pro-

longs the period of viability to a greater degree than either Ringer's solution or distilled water.

4774

Electrophoretic Mobility Velocities of Rough and Smooth Avian and Bovine Tubercle Bacilli.*

MORTON C. KAHN AND HELEN SCHWARZKOPF.

From the Department of Public Health and Preventive Medicine, Cornell University Medical College, New York City.

Falk[1] showed that the electrophoretic mobility velocity (potential difference) of diphtheria bacilli varied according to their virulence, the more virulent organisms showing low mobility rate, while those of a less virulent nature gave a higher reading. For pneumococcus,[2] on the contrary, he found that the potential difference is higher the greater the virulence for white mice and *vice versa*. The sequence of decreasing potentials was shown to be Types III, I, II, IV, which follows the decreasing virulence for white mice. This work on the pneumococcus was carried out prior to the isolation of several new types from the erstwhile group IV.

Following the technique of Petroff[3] the writers undertook the dissociation of a stock strain of avian tubercle bacillus procured originally from Dr. Krumwiede of the Research Laboratories, New York City Department of Health. When the culture was planted on Proskauer and Beck medium after a suitable period of incubation at 37° C. the organism had dissociated into rough and smooth types of colonies. Representatives of each were selected and planted on glycerine agar and on Petroff's egg medium slants. After 5 generations the organisms are still truly representative of the original parent colonies from which they were taken. Other tests were performed on rough and smooth avian and bovine colonies dissociated by Dr. Petroff.

In view of the hypothesis that smoothness of colony may be an indication of virulence, while roughness may be taken as an indication of the reverse, the writers determined the mobility veloci-

* This experiment is part of a group investigation being carried on in conjunction with the Medical Research Board, National Tuberculosis Association.

[1] Falk, I. S., and Jensen, L. B., *J. Bact.*, 1928, xv, 367.

[2] Falk, I. S., *J. Infect. Dis.*, 1925, xxxvii, 481.

[3] Petroff, S. A., PROC. SOC. EXP. BIOL. AND MED., 1927, xxiv, 632.