Letters to the Editor

Terrestrial Thermodynamics of an Ice Age

In the article by the late Gilbert N. Lewis, entitled "Thermodynamics of an Ice Age: the cause and sequence of glaciation" (*Science*, 1946, **104**, 43–47), no mention is made of the theory proposed by Dr. Edward O. Hulburt, namely, that the warming and cooling of the earth is controlled by the proportion of carbon dioxide in the earth's atmosphere. This theory is important in relation to the growth of vegetation, which removes the carbon dioxide from the air and consequently can explain the alternate cooling and warming of the earth, and the Carboniferous ages and their sequelae.

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Effect of Streptomycin on Budwood Infected With *Phytomonas pruni*

Streptomycin, both crude and crystalline, has been used successfully in freeing plum budwood from infection with *Phytomonas pruni*. The crude streptomycin was produced in this laboratory by a culture of *Streptomyces griseus* supplied by Selman A. Waksman, New Jersey Agricultural Experiment Station; the crystalline streptomycin was supplied by Schenley Laboratories, Inc.; and the budwood came from hybrid plum trees sent to us by a large nursery company. The nursery supplying the infected trees stated: "Until we can obtain disease-free trees it seems that the propagation of this otherwise valuable variety will be impractical." Unless the budwood could be disinfected without injury, the bacterial disease (black spot and canker) would be transmitted to the new tree.

Budwood used in the experiments consisted of infected pieces of branches 5.5 to 6.5 inches long, on which bacterial lesions ranged in length up to 1 inch; in width, up to those almost girdling the branch, and in depth, up to those reaching inward to the stele. Some lesions had cracked open.

The pieces of budwood were placed in a vertical position in beakers, with the basal 1½ inches immersed in the streptomycin solution; other pieces were placed in a horizontal position and completely submerged in the solution. The budwood thus arranged was then placed in an enclosed chamber and submitted to negative pressure by connecting the chamber to an ordinary laboratory-tap aspirator. The pieces of budwood were carefully cultured before and after the treatment. The experiments were run at room temperature, 22°–25° C. Controls were likewise handled with sterile distilled water taking the place of the streptomycin. After treatment the pieces of budwood were also tested for injury to the buds by giving them a chance to sprout and develop.

Time has not permitted definite determination of the minimum length of treatment or the minimum concentration of streptomycin necessary for complete disinfection. However, crude streptomycin showing a strength of 6–8 Oxford units (as tested against *Staphylococcus aureus*) and a strong concentration of the crystalline drug in sterile distilled water, acting overnight as described, resulted in budwood from which no organisms whatever could be cultured. The treated budwood produced clean leaves, and no visible evidence of injury was apparent. Controls in culture gave abundant growth of *P. pruni* that was carefully checked against a standard culture of the plum-strain of the bacterium from the American Type Culture Collection.

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Isolation of Type A Influenza Virus in Recent Epidemic in Chicago Area

Type B influenza virus has been reported (*Epidemiol. Inf. Bull.* (*UNRRA*), 1946, **2**, 105) as the cause of the mild epidemic which reached its peak in December 1945 in this country and a month or two later in England. So far we have seen no reports of the isolation of Type A virus during the past winter in the United States.

Only 30 specimens were examined in our laboratory and from only one of these was virus obtained. Since it was identified as a Type A virus, however, we feel that its isolation is worth reporting. Failure to obtain virus from a larger proportion of cases may have been due to the conditions under which specimens were delivered to the laboratory.

Preliminary experiments in our laboratory had indicated that influenzal virus in throat washings might be expected to survive transmission through the mails if not delayed too long in transit. It did not prove possible, however, to carry out arrangements with three local hospitals whereby duplicate specimens of throat washings were to be sent to our laboratory, one by messenger and the other by mail. Most of them were transmitted by mail only and were sent during the period of congested mail service around Christmas and New Year's Day. From one specimen which had been stored in a dry-ice refrigerator until it could be delivered by messenger virus was isolated as mentioned above.

Four serial passages through 10-day eggs were made of each specimen, three eggs at each passage. For the first passage a portion of the specimen was treated for 15 minutes with enough penicillin to provide 100 Oxford units/0.1 cc., the amount inoculated into each egg. Previous tests in our laboratory had shown that several times this amount would not retard multiplication of PR8 virus in eggs.

Serial mouse passages, usually four in number (two to four mice each passage), were carried out on the first 17 specimens received. Single hamsters were injected intranasally with each of the 13 remaining specimens. For