(4) Adopt a specific plan.

(5) Determine ways and means of obtaining funds to guarantee the financing of the organization during its first three to five years. (It would be assumed that the organization would be self-supporting at the end of this time).

(6) Select and appoint a permanent executive secretary and establish a permanent office.

It would be assumed that this proposed organization would be one in which biologists would participate for the concrete benefits they would derive from it.

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A POSSIBLE EXPLANATION OF "FREEZING" BEHAVIOR IN RATS

CURRENT adherence to the doctrines of biologism in the study of animal behavior has tended to obscure interest in the beginning of socially determined action and to favor explanations based on hereditary or innate patterns of individual variation. Thus in maze studies with small animals where the organisms are housed in groups in one cage, differences in learning scores in the maze are seen as the product of heredity or of the specific conditions of diet and experimentation. Very rarely is mention made of social interaction in the group-housing situation, although it is well known that patterns of dominance, aggression, food-hoarding and sex play exist. Surely some correlation may be expected between behavior under experimental control and the social environment of the living cage.

The author had an opportunity to apply the implications of the foregoing to random observations made over a period of some years during which the behavior called "freezing" was studied incidentally. "Freezing" is a phenomenon found particularly in learning experiments with rats and guinea pigs. It refers to a state of immobility on the part of the organism when it is inserted into the learning apparatus. The subject simply sits at one point in the maze. Increase in motivation is rarely effective in causing cessation of "freezing," which may continue for many trials and is then apt to disappear suddenly. The difficulties in incorporating data from such animals into learning studies have led some authorities to recommend the elimination of the organisms and the data from consideration. Where any discussion is found of the phenomenon, it is usually ascribed to emotional disturbance or to "pure cussedness."

The data under discussion here were derived from two groups of animals, one living in groups of six rats to a cage, the other consisting of animals in isolated, single cages. Of the 124 rats in the first group, eighteen manifested "freezing." Only two rats in the other group displayed the behavior. Sex, age and stock variations were ruled out as causal, as were differences in handling since all these factors were identical for both groups. The only major difference in the treatment of the two sets lay in the manner of their housing and its consequences. Systematic observation of the behavior of the group-housed rats led to a variety of data of which only part will be presented here as preliminary to a larger report. This note takes into account only that aspect of the inter-organismic relationship in which aggression of one or more animals against another is manifested. Social hierarchies such as those found among chicks and baboons are not well established in rats but fighting is common and there have been some observations of dominance and submissiveness under these circumstances. In our animals, of those which "froze" from the group-housed experiments, fifteen were definitely and rather consistently the submissive or aggressed against organisms. The remaining three were all dominant and winners in fighting. It would seem then that the phenomenon in question is the result of the hitherto uncontrolled factor of social interaction in the living quarters of the experimental animals.

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SCIENTIFIC BOOKS

VIRUS DISEASES

Virus as Organism. Evolutionary and Ecological Aspects of Some Human Virus Diseases. By FRANK MACFARLANE BURNET. 134 pp. Cambridge, Mass.: Harvard University Press. 1945. $2.00.

THIS book, which is an expansion of the Dunham Lectures given at the Harvard Medical School, presents a discussion of some virus diseases of man from a consistently biological viewpoint. The discussion is the best that has ever been presented of the broad evolutionary and ecological aspects of virus disease. The author, who is a distinguished investigator and director of the Walter and Eliza Hall Institute of Research in Pathology and Medicine in Melbourne, Australia, does not pretend to discuss representative virus diseases or to present a balanced picture of the causative agents. He restricts himself to the six virus diseases which have been under investigation in his laboratory and confines his central theme to a por-