

adopt the view that one is dealing with minute parasitic forms. Some of the filterable viruses (pleuro-pneumonia of cattle, fowl pest, fowl diphtheria, epithelioma contagiosum and Novy's rat disease) have been cultivated, so that the question as to whether we are dealing

realize Osborn's³ "hypothetical chemical pre-cellular stages"; they lie somewhere in the scheme between simple colloidal and more complex cellular states like bacteria. Some thirty-two or thirty-three disease-producing filterable viruses are now known to exist, so it

TABLE SUMMARIZING CHARACTERS OF POLYHEDRAL VIRUS OF INSECTS

1. Cultivation of virus	Has not been cultivated
2. Filtration of virus	Passes through Berkefeld "N" but not through Pasteur-Chamberland filter
3. Examination of virus with ultra-microscope.	Nothing visible that could be interpreted as being different from minute protein or pigment particles
4. Effect of heating on virus when suspended in water	Destroyed at 60° C. in 20 minutes
5. Effect of dry heat on virus	Destroyed at 70° C. to 80° C. in 20 minutes
6. Effect of drying on virus at room temperature.	Resistant for 2 years
7. Effect of glycerine on virus	Resists 98 per cent. for 6 months
8. Effect of direct sunlight on virus when dry	Resistant for 12 hours
9. Effect of putrefaction on virus	Resistant for an indefinite time
10. Effect of alcohol on virus	Destroyed by 80 per cent. in 15 minutes
11. Effect of carbolic acid on virus	Destroyed by 5 per cent. in 3 weeks.
12. Effect of virus on 1 per cent. sugar solutions	No growth, no fermentation
13. Effect of virus on methylene blue and sodium nitrate solutions	No growth, no reduction
14. Effect of virus on gelatin and casein	No growth, no liquefaction

with organisms or not is solely an academic one. We are justified at present, however, in not classifying such viruses either with the plants or animals.

The table gives a summary of the chief characters of the wilt virus. The virus used in these tests was prepared from diseased gipsy moth, army worm and tent caterpillars. That proteins like gelatin and casein are not affected when treated with the filtrate in which the virus has been concentrated by centrifuging is curious because insect tissue is completely emulsified through the action of the wilt virus. This action is therefore probably a cytolytic one due to the action of toxins and is not caused by the elaboration of a proteolytic enzyme on the part of the virus.

In a physico-chemical explanation of the origin of organisms on our planet the filterable viruses seem to be of considerable interest and I do not understand why they seem to be so persistently neglected by all writers on the evolution of life. The filterable viruses probably

is reasonable to assume that the earth, water and atmosphere are full of non-parasitic forms which we have no means of recognizing at present.

R. W. GLASER

BUSSEY INSTITUTION,
HARVARD UNIVERSITY

³ "The Origin and Evolution of Life," by Henry Fairfield Osborn, Charles Scribner's Sons, New York, 1917, p. 80.

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