BIOLOGY

Artificial Creation of Life May Come From Virus Study

Research Leads to Finding That Treatment Renders Virus Inactive; May Throw Light on Protoplasm

PRODUCTION of life in the laboratory, the dream of modern biologists as the making of gold was the dream of medieval alchemists, may hinge on better understanding of disease viruses like those of smallpox, tobacco mosaic, and hog cholera.

"If we are ever able to synthesize virus proteins in the absence of living cells, then we shall have gone a long way towards the synthesis of protoplasm," declared Dr. W. M. Stanley of the Rockefeller Institute for Medical Research, Princeton, N. J., before a meeting of naturalists in connection with the A.A.A.S. meeting at Indianapolis.

But before that can happen, biologists must first find out how the virus molecules synthesize themselves. These protein units, relatively enormous as molecules go, can invade a cell, take parts of its life-materials, and build up other molecules like themselves. A few of them, introduced into plant or animal, multiply to millions and make the host organism sick unto death.

As yet nobody knows how they do it. Dr. Stanley suggested a possible analogy, in the case of certain complex inorganic compounds capable of forming crystals, yet which do not form them until they are "seeded" with tiny crystals that serve as "patterns" for the process. Perhaps the invading virus molecules serve as patterns in a similar but much more complex process.

Beginning or End

Although the virus molecules are now well established as non-living things, possessed of certain very lifelike characteristics, it is not necessary to look upon them as the lowest beginnings of what might possibly turn into life—as a sort of pre-living or proto-living condition of matter. They may even represent the last stages in the reverse process; may be the ultimate degeneration of life.

When an organism takes to a parasitic mode of living it loses things that it once needed in independent life. Parasitic plants lose their leaves, parasitic insects their wings. The most advanced stage of parasitism in larger organisms comes when all that is left of the organism consists of a set of organs to feed with and a set to breed with. There are some worms like that — the tapeworm, for example.

Dr. Stanley suggested, on the basis of a discussion by a fellow-scientist, that we might think of a one-celled parasite invading the cells of a host plant or animal. It would first lose its cytoplasm, passing on to its host the jobs taken care of by that part of the cell.

Then the nuclear organization might go, finally leaving only large, complex molecules of nucleo-proteins capable of taking material from the host and using it in self-multiplication. That last stage is about a picture of what disease virus molecules now are. They may thus be either at the bottom of life on the way up, or at the top of non-life on the way down.

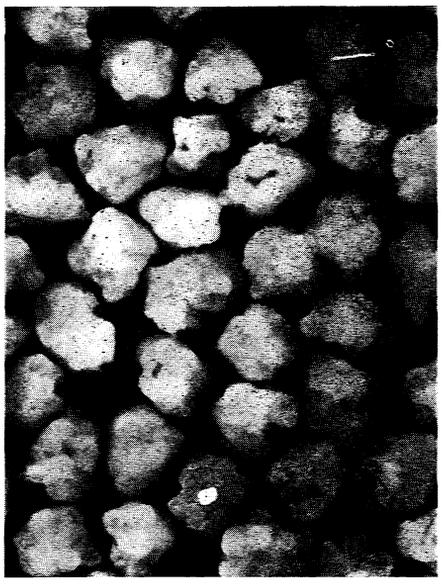
Protection Against Virus?

Hope that men and animals will be protected against the virus diseases, among them encephalitis, infantile paralysis, parrot fever, yellow fever, and certain kinds of cancer, was expressed by Dr. Stanley in another paper.

Dr. Stanley has now extended his pioneer work demonstrating the protein nature of the cause of so-called virus diseases, with two important results:

1. Proteins obtained from virus or mosaic diseases of plants, when treated with hydrogen peroxide, formaldehyde, nitrous acid or ultraviolet light, become inactive. Although slightly altered chemically, they still retain certain chemical and serological properties characteristic of the virus protein. If similar results with viruses affecting man and animals can be obtained, there may be produced material useful in the protection or immunization against such diseases.

2. Intermediate in size and properties between living organisms and non-living molecules, the protein may represent "a type of entity hitherto unrecognized." This means that a new class of matter, neither living nor non-living, may be discovered. Because the protein has the ability to reproduce itself under certain conditions, the understanding of this mechanism may throw light upon the way in which protoplasm, the stuff of life, grows.



X-RAYS INSPECT

It is no longer necessary to bite into a piece of candy to discover a bit of metal that may have been enclosed by mistake. X-ray inspection is used by some candy manufacturers to detect foreign matter, as in this X-ray picture. Notice the white marks portraying unwanted particles in the candy at top right and at the bottom.

Dr. Stanley in his paper before the scientists explained that the tobacco mosaic virus, upon which he has done the most work, is intermediate in size between ordinary molecules and living organisms. It possesses some properties characteristic of molecules and some like those of living things.

To biologists one of the most interesting things about the disease-causing protein-virus is its ability to change into other strains, that is, to mutate as the geneticist says. When the change of strain takes place, the protein of the new strain is different from that of the old virus protein.

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PHARMACY

Coal Tar Yields Narcotic That Rivals Codeine

A NEW pain-killing drug that can be created synthetically from coal tar was reported by Prof. Erich Mosettig of the University of Virginia before the 7th National Organic Chemistry Symposium.

The synthetic drug equals codeine in narcotic effectiveness. Codeine, like mor-