BIOCHEMISTRY

Virus Seizes Cell Prey

Chemical groups of atoms on the cell's surface are used by bacterial virus to snag its victim, studies with bacillus tagged with radioactive phosphorus show.

➤ A BACTERIAL virus takes hold of its cell victim by means of particular chemical groups of atoms on the cell's surface. This strategy in submicroscopic germ warfare has been discovered by Drs. L. J. Tolmach and T. T. Puck of the University of Colorado Medical Center. They report their discovery in the *Journal of the American Chemical Society* (Nov. 5).

Two viruses, T1 and T2, labeled with radioactive phosphorus were studied in their combinations with a culture of a colon bacillus, named E. *coli* B, in the experiments of the Colorado chemists. They treated the bacillus cells with a number of chemical reagents to modify their chemical structure. They then traced the effect on the cells of adding one or the other of the labeled viruses.

Although the radioactive phosphorus in the structure of the virus permitted it to be followed and its fate learned, the results obtained by Drs. Tolmach and Puck rule out the possibility that phosphoric acid plays an important part in the combination of virus and cell.

Other chemically reacting structures in the cell which these scientists expected to take part in attachment to the virus are the carboxyl, the amino, the sulfhydryl and the phenolic-hydroxyl groups. Between these, the tracer experiments of the scientists decided in favor of the first two.

The two types of virus used by the experimenters are not alike in their method of seizing their prey, Drs. Tolmach and Puck report. Virus T2 appears to demand that the cell with which it combines have an intact carboxyl group, the essential structure for an organic acid. It is indifferent to the presence of amino groups in the cell molecule.

Virus T1 insists upon the presence of one or more amino groups, but it is not so particular about carboxyl groups. The specific nature of these combinations is believed by these experimenters to be characteristic of the way organisms can be resistant to some viruses and susceptible to others.

Ionic bonding, which is mainly responsible for chemical combinations among inorganic chemicals, rather than the weaker kinds of association often found between organic chemicals, seems responsible for combinations between virus and cell, according to Drs. Tolmach and Puck, although they do not rule out other kinds of chemical forces.

The difference in the chemical behavior of the cell with the two kinds of virus, according to the Colorado chemists, is evidence of the "blocking of specific chemical groupings on the cell surface, rather than random disorganization of cell structures."

Science News Letter, November 29, 1952

VOLCANOLOGY

Record Volcano's Sounds

➤ STRANGE SOUNDS, never heard before by human ear, have been recorded by three Scripps Institution of Oceanography scientists who flew over a new Pacific volcano 780 miles southwest of San Diego, Calif.

The volcano, San Benedicto, has erupted again. The scientists, flying in a Navy PBM plane, dropped floating sonobuoys that picked up the sounds of the volcano and transmitted them to the plane. There, they were recorded on magnetic tape. The scientists describe them as "something new in recorded sound."

The volcano erupted through two small vents in the lava floor of the crater every five to six minutes. If it builds up enough pressure inside, it might very possibly produce a vast explosion.

The volcano was first reported from a tuna fishing boat as erupting every five minutes, with its flames visible for 40 miles. By studying the recordings, the scientists hope to get some idea of the intensity of volcano sounds at varying distances and to learn to distinguish between volcanoes heard underwater and other underwater sounds.

The plane was over the volcano for an hour and a quarter. The scientists were James M. Snodgrass, head of the Scripps division of special services; Douglas L. Inman, assistant research geologist, and Adrian Richards, assistant.

Science News Letter, November 29, 1952

Do You Know?

About 5,000,000 gallons of *paint* are used annually to mark streets and highways for traffic.

World production of industrial *diamonds* reached an all-time high of 14,000,000 carats in 1951.

The average American family spends about $5 for *medical care* out of each $100 of family income.

Tiny cannibalistic *spiders* that live by eating each other have been found at elevations of 23,000 feet on Mount Everest, 4,000 feet above the limit for plant life.

A flashlight-sized *dry cell* now is being perfected that uses the oxygen of air as one of its reactive ingredients; when exhausted, it can be refueled like a cigarette lighter.