BIOCHEMISTRY

New Method May Detect Martian Life

➤ A NEW, EXTREMELY delicate method that could be used to detect simple life forms on the planet Mars was reported in Anaheim, Calif.

It is the most sensitive way yet developed for spotting the chemicals essential to life. Invisible amounts of amino acids can be measured by the technique, Dr. John W. Westley of Stanford University has found.

As little as one-billionth of a gram of living material could give positive evidence of amino acids, he told the American Astronautical Society meeting. The technique is based on the fact that all known life forms contain basically similar molecular structures.

Dr. Westley devised a method of measuring this sameness by combining procedures for detecting amino acids and for identifying the specific amino acids involved. He reported that this combination technique has been used to chart "marked changes" in the chemical compounds remaining within 24 hours after a sample of soil containing simple life forms was inoculated with certain polymerizing materials.

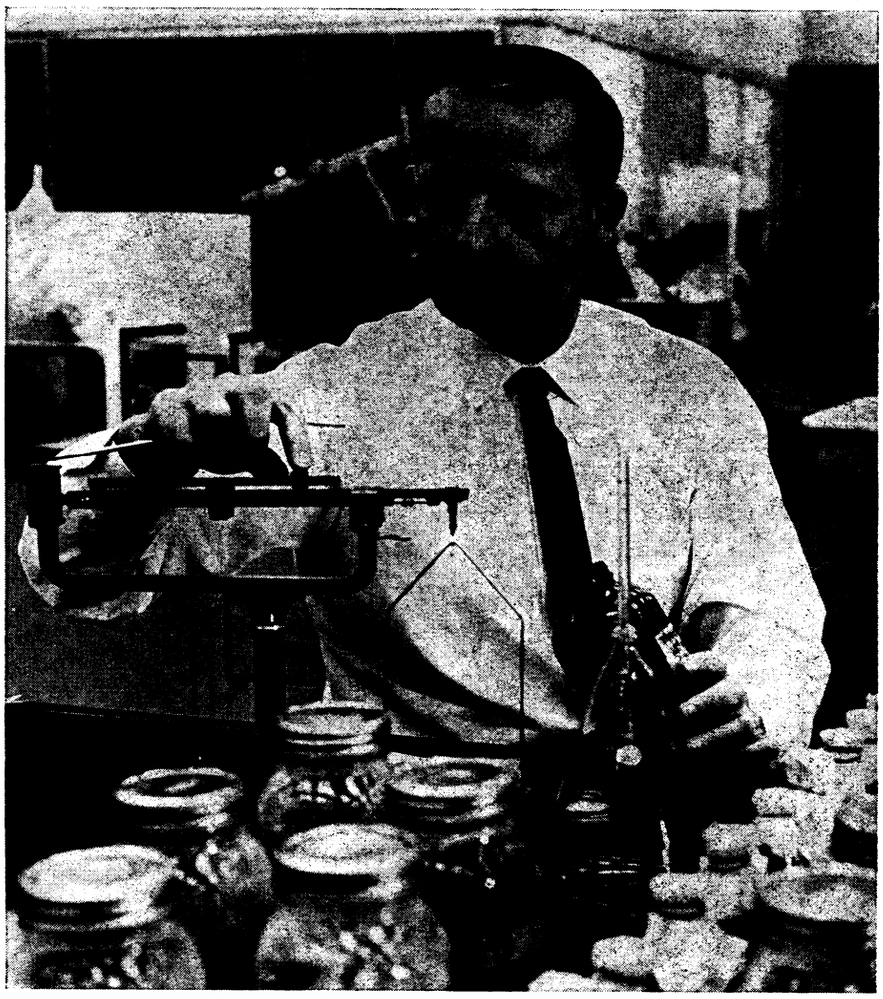
The materials are called racemic, meaning that they consist of equal amounts of molecules that rotate polarized light to the left and to the right, and thus such materials show no preference to rotate polarized light either to the right or to the left. All life forms, on the other hand, have a definite preference for rotating light either to the left or to the right, a characteristic scientists call optical purity.

Dr. Westley's experiments show that the life forms in the soil devour more of the nonliving racemic materials that rotate light to the left than they do of the right-rotating kind. The difference can be measured, although the exact nature of the living system responsible for the left preference is not known.

However, the high rate of increase in consumption of the left-rotating materials that promote polymerization suggests the growth of microorganisms.

The technique used to detect the amino acids combines what is called "gas-liquid chromatography" with mass spectrometry.

Life could also be detected on Mars by other methods, such as the instrument that has been dubbed the "Wolf Trap" or the apparatus known as "Gullivar."



Philco Corporation

DESERT SOILS—Soil taken from the desert in northern Chile is being studied for microbial life by Philco Corporation scientist Dr. John B. Opfell. This study will help researchers at Philco's Aeronutronic Division, Newport Beach, Calif., design life-detection instruments for use in planetary exploration.

PHYSICS

Double Hyper-Nucleus

➤ THE FIRST DOUBLE hyper-nucleus discovered in the United States, and the second anywhere in the world, has been detected by Dr. Derek J. Prowse.

The discoverer, appropriately enough, is a man who holds a double academic position, being both professor of physics at the University of California at Los Angeles and chairman of the department of physics at the University of Wyoming.

Dr. Prowse's double hyper-nucleus is the first known example of a lambda helium nucleus with an atomic weight of six.

A normal nucleus consists of neutrons and protons, and in the case of the helium nucleus, which has an atomic weight of four, it consists of two neutrons and two protons.

The helium double hyper-nucleus has, in addition, two strange particles called lambda hyperons. A lambda hyperon is a particle that behaves much like a neutron but is slightly heavier and quite unstable, having a life-span of only one-billionth of a second.

The new find, Dr. Prowse said, may foreshadow the development of a complete periodic table of chemical elements with double, and possibly triple, hyper-nuclei.

Of more immediate importance to elementary particle physicists is the additional light shed by the discovery of the powerful nuclear forces that bind together the two lambda hyperons.

The world's first double hyper-nucleus, that of a beryllium atom, was discovered three years ago by Profs. Marion Danysz and J. Pniewski of the University of Warsaw, Poland.