

BIOCHEMISTRY

Space Life on Earth

Bacteria-like cells from sterilized meteorites have reproduced themselves in test tubes. These cells could be proof that life exists outside the earth, Tove Neville reports.

► LIFE believed to have come from outer space is being grown in test tubes here on earth.

Several generations of bacteria-like cells taken from sterilized meteorites falling to earth's surface from an unknown source in space have reproduced themselves.

These bacteria-like cells, found inside stony meteorites, may be proof there is life outside the earth. However, they could also be an earth form of bacteria that has seeped into the meteorite with water after it fell to the earth. Dr. Frederick D. Sisler of the U.S. Geological Survey has grown these cells in a sterile laboratory at the National Institutes of Health, Bethesda, Md. Dr. Walter Newton is his collaborator.

He told SCIENCE SERVICE that meteorites are easily "contaminated" with organic matter on their surface. It is therefore important to sterilize them before breaking them open to see if the interior contains any life forms that may have originated somewhere outside the earth.

The stony meteorite used by Dr. Sisler was the carbonaceous chondrite that fell at Murray, Ky., in 1950. It is very dense and would not be easily contaminated. Some scientists have found organic matter in meteorites more porous and more easily invaded by organisms.

Dr. Sisler sterilized the meteorite in a solution and pulverized small amounts of the inside with sterile mortar and pestle. He inoculated this material into rats, chickens and mice and also put it in a salt water solution to see if it would grow as do bacteria from the soil.

He said the particles from the meteorite grew and reproduced themselves in the salt water medium, consisting of seawater, peptones made from proteins and polysaccharides (sugars). However, they did not grow in the animals as earth bacteria normally would.

The particles can therefore not be called bacteria, Dr. Sisler said. They are not organisms but behave like organisms and are made of organic matter. Dr. Sisler said if they are earth contaminants, they are of a very unusual type.

Dr. Sisler has worked with rocks millions of years old and has found that microorganisms can seep into rocks with water and stay there in an inactive stage. When this happens the organisms lose some enzymes and some of their identity.

It could be such organisms that Dr. Sisler has found. He said his research with the meteorites is intended to find the origin of the living particles in the meteorites.

To be positive the living particles were

in the meteor before it hit the earth, satellites might be sent out into space to "catch" them before they became contaminated in the earth's atmosphere or on the ground.

Dr. Sisler said the National Aeronautics and Space Agency could help settle this question by developing a satellite that would be able to catch a meteor some 50 miles above the earth. Bacteria that could contaminate the meteor have been found as high as 20 to 30 miles, he said. The satellite would have to be equipped to grab the meteor and bring it back to earth in germ-free condition so it could be examined aseptically.

Meteorites could also be gathered in Antarctica for study of life forms, as they would not be contaminated throughout. Bacteria on their surface would be in suspended animation, since they cannot live actively in Antarctic temperatures.

Dr. Sisler first examined the Murray meteorite in 1959 with an infrared spectrophotometer. He discovered several organic radicals found in living material such as amine, nitroso, nitrile and some hydrocarbon.

These findings were checked by Dr. Melvin Calvin at the University of California both by infrared spectrophotometer and a gas chromatograph and the same results were obtained.

Now Dr. Sisler has shown the material reacts like living matter.

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OCEANOGRAPHY

Pacific Ocean Survey From Hawaii to Alaska

► THE FIRST THOROUGH and accurate survey of ocean waters began April 11.

The U.S. Coast and Geodetic Survey will conduct the study along a 1,900-mile line between Hawaii and Alaska, Dr. H. B. Stewart, Jr., chief oceanographer, said at the National Bureau of Standards in Washington. Using highly refined navigational aids, the ocean survey will be the most accurate ever made.

The survey will cut a 130-mile swath across the ocean between the Hawaiian Islands and the northwestern tip of the North American continent. Scientists from other Government agencies will join Coast and Geodetic scientists in the massive assault on the oceans.

Charts of the ocean floor will be prepared. These are important for military purposes and for studying the ocean's effect on weather.

The position of the Survey's ship will always be known with an accuracy of 1,000 feet, Dr. Stewart said. Previous oceanographic expeditions normally relied on "dead reckoning" and were frequently as far off as two miles from the true position. The ship, Pioneer, will be carrying a highly sensitive direction finder for "pinpointing" its position when depth soundings or water samples are taken.

Dr. Stewart hopes this will be the first step toward the increased exploration of the seas urged by President John F. Kennedy.

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LOADED DOWN—The U. S. Navy's light attack aircraft, the Grumman A2F-1 Intruder, carries 30 five-hundred-pound bombs in clusters of three. The all weather plane was designed for troop support.