

BIOLOGY

Meteoritic Life Studied

The chemical compounds of biological origin found in meteorites may have originated in space or they may have been picked up after the meteorite reached earth.

► THE SMALL LIFE-LIKE particles riding to earth on fiery meteorites may have come from space or they may have been picked up on earth after the meteorite reached the surface.

The puzzling origin and structure of these organic compounds were debated at the National Academy of Sciences meeting in Seattle, Wash.

Chemical compounds of biological origin have definitely been found and identified in meteorites, Nobelist Harold C. Urey of the University of California in San Diego, reported.

The problem now is to determine their origin, Dr. Urey said. He believes the particles result from contamination of the meteorites after they arrived on earth, not that they formed in outer space.

However, it is difficult to prove that they did originate on earth, although this could possibly be proved by eliminating all possible sources of contamination.

The possibility of finding life originating in outer space arose a few years ago when a team of scientists discovered two dozen different types of life-like particles from a meteorite that fell in Orgueil, France, on May 14, 1864.

These scientists included Dr. Bartholomew Nagy, now at the University of California, San Diego; Dr. Warren G. Meinschein of Esso Research and Engineering Company, Linden, N.J., and Dr. Douglas J. Hennessy of Fordham University, New York.

Using such techniques of analysis as infrared and ultraviolet spectroscopy, X-ray diffraction and high molecular weight mass spectroscopy, the scientists detected certain organic compounds, hydrocarbons believed to indicate life. These hydrocarbons are similar to those occurring on earth in living matter, and seem to have been produced by earth-type organisms.

Some of the particles were polygonal and others were round in shape. Some appeared to be covered with spines, and others had folded wing-like appendages.

The compounds that have definitely been identified include saturated and aromatic hydrocarbons, fatty and aromatic acids, nitrogenous and sulfur-containing organic compounds, reported Drs. Nagy, Meinschein and Hennessy in one analysis of the problem. Mineralized microstructures resembling microfossils have also been identified, as well as alkanes or saturated hydrocarbons.

Since the microorganisms were identified, scientists have been trying to determine their origin and how they got into the meteorites.

Some scientists believe they rode in from space on the meteorites, thus opening up

the exciting probability of life existing in places other than earth. Other scientists just as vehemently believe that the tiny fossils were merely earth forms that had been trapped by the meteorites on their rapid fiery trip through the earth's atmosphere or after they reached the surface.

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PSYCHOLOGY

Difficult Childhood May Cause Amnesia

► ADULTS who had difficult childhoods may be the most easily hypnotized, a psychologist suggested.

Prof. Ernest R. Hilgard of Stanford University said a "disproportionate number" of easily hypnotized persons turn out to be those who were severely punished in childhood. This is also true of amnesiac individuals, he reported to the National Academy of Sciences meeting in Seattle, Wash.

Dr. Hilgard suggested that when someone learns to bow down to hard authority, he also learns to blot out the resulting pain.

He said, "hypnosis for some subjects may go something like this:

"I will do what this strong person tells me to do, but I will not dwell upon what I have done."

Individual differences show up in the manner of forgetting after a hypnotic session. "Near" recall is common, he said. But sometimes events are visualized clearly. The subject is simply unable to vocalize what he just experienced under hypnosis.

Despite the new information, Prof. Hilgard pointed out that scientists know little about amnesia.

"It is surprising, in view of its importance, that there is so little we can confidently say about amnesia," he said.

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PHYSICS

Dr. Pauling Proposes New Theory of Atomic Nucleus

► A TWO-TIME NOBEL PRIZE winner, Dr. Linus Pauling, has proposed a new structure of how subatomic particles fit together within the nucleus.

Dr. Pauling is now at the Center for the Study of Democratic Institutions, Santa Barbara, Calif. He is presenting his new explanation of the structure of protons and neutrons in atomic cores to a wide scientific audience, including a verbal report given to the National Academy of Sciences meeting in Seattle, Wash.

He calls his picture of an atomic nucleus the "close-packed spheron model," spherons being clusters of neutrons and protons. Dr.

Pauling's proposed structure is related to the so-called "shell model" of the nucleus for which Dr. Maria Goeppert Mayer shared the 1963 Nobel Prize in Physics.

Dr. Pauling pictures the nucleus as consisting of one or more layers of spherons, packed tightly together in the closest possible fashion. Such an arrangement, Dr. Pauling reported in *Nature* 208:174, 1965, provides a "simple explanation of magic numbers."

The properties of atomic nuclei have been found to have greater stability when a nucleus contains certain numbers of neutrons and protons, hence the name "magic numbers."

One of the nuclear properties explained by the theory is asymmetric fission.

Dr. Pauling is also reporting the proposed new structure in the *Proceedings of the National Academy of Sciences* Oct. 15, 1965, *Physical Review Letters* 15:499, 1965, and *Science* 150:297, 1965.

Dr. Pauling won his first Nobel Prize in 1954 for his theory on the fundamental nature and behavior of molecular bonds. He was awarded his second, the Nobel Peace Prize, in 1962 for his efforts to promote a ban on nuclear tests. The only other person to win two Nobel Prizes was Mme. Curie, co-discoverer of radium.

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IBM

IMITATING ATOMS—By rolling different sized balls into an inclined tray, scientists can duplicate what happens when atoms from hot metallic vapors are frozen onto a cold surface. Shown here are Drs. Arthur S. Nowick and Siegfried R. Mader, the International Business Machines scientists who developed the technique. The model gives complete insight into how different atoms group together to form thin alloy films. Because the films are made by depositing metals directly from a vapor, without going through a liquid stage, they do not follow the traditional rules of metallurgy.