GEOPHYSICS

# Sun Affects Mars Cap?

➤ PARTICLES HURLED into space from the sun at the time of a giant solar flare could have caused the temporary disappearance of a polar cap on Mars, three Czechoslovakian scientists have suggested.

The south polar cap of Mars, they reported, vanished for a few days in late August and early September 1956 when Mars last came within about 35 million miles of earth, one of the closest possible approaches.

This was the time of an important flare on the sun, which is known to spray huge clouds of solar material into space, detected on earth mostly in the form of the nuclear particles known as protons, the cores of hydrogen atoms.

Scientists in the United States who were queried about the Czechoslovakian report considered it "highly speculative." They pointed out that, despite many years of research, no one had yet established a direct connection between solar activity and weather on earth.

The energy of protons in solar flares is only one-hundred-thousandth that of direct sunlight and would, therefore, be much too weak to cause direct temperature changes. Experiments have shown that solar energy can cause chemical changes only over periods of several thousand or several hundreds of thousands of years.

Mars has an atmosphere much less dense than earth although exactly how much thinner is not known. This would mean that solar particles could penetrate closer to the Martian surface.

On the other hand, it is from 35 million to 63 million miles farther from the sun, which would somewhat decrease any solar effects.

The Czechoslovakian scientists made their report in Nature, 205:995, 1965. They suggest that solar particles penetrated far enough into the Martian atmosphere to cause chemical and temperature changes on the surface, resulting in the disappearance of the south polar cap.

The scientists are Drs. L. Krivsky of the Czechoslovak Academy of Science's Astronomical Institute, Ondrejov; J. Cech of Palacky's University, Olomouc, and J. Sadil of the Czechoslovak Astronomical Society, Prague.

• Science News Letter, 87:180 March 20, 1965

GEOLOGY

# Rock Ages Measured

➤ NEW MODERN METHODS now help geologists tell the age of our ancient rocks, according to Dr. E. J. Zeller of the University of Kansas, Lawrence.

One of the latest methods tells a rock's age by measuring the amount of amino acids in the rock, Dr. Zeller reported in Mineral Information Service 18:9, 1965, a publication of the California division of mines and geology.

Amino acids are complex organic molecules found in living organisms. They are present in certain deposits in sedimentary rocks, as geologists call conglomerations of different kinds of rocks deposited during the ages by erosion and water.

Since different amino acids break down at different rates, their groupings change with time, and the total amount of all amino acids decreases. By analyzing the amount of amino acids in rock samples, geologists can calculate how old the rocks are. This chemical method of telling geological time works best in analyzing rocks of recent sedimentation.

Another relatively new method now being developed is to measure the damage to rock crystals caused by radiation from natural radioactive impurities in the minerals. The damage can be traced by measuring the amount of thermoluminescence, which is the light many natural minerals emit when they are heated to certain temperatures. The light is a form of released energy from electrons, and is emitted only once. A second heating will not produce further luminescence.

The most widely used and highly developed method of telling the age of rocks still continues to be the uranium-lead and carbon 14 system, Dr. Zeller pointed out. A mineral rock begins its geologic life free of lead, but as time passes its uranium decays to form lead through a complex series of radioactive decay steps.

Since geologists know the rate at which lead is produced from uranium, and can measure the amount of both uranium and lead in the rock sample, they can easily calculate the length of time it took to form the lead—hence, the age of the rock.

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GEOPHYSICS

## Cross Measures Moon Mass From Spaceship

➤ A CAREFULLY BALANCED aluminum cross will be used to measure the mass of the moon from an orbiting vehicle by detecting the moon's gravitational field.

The cross, which is only five inches in diameter, can also be used on deep space probes to measure the mass of asteroids. The gravitational pull of the moon or asteroid will cause the cross, spinning within a vacuum chamber, to send out signals that can be measured in terms of the object's mass.

The gravitational sensor is being built by Hughes Aircraft Company, Malibu, Calif., under a National Aeronautics and Space Administration contract.

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## Questions



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