

## ASTRONAUTICS

# Report on Space Probes

**Cosmic radiation, the presence of an atmosphere on the moon's surface and proposed probes to Mars were reported by scientists at an International Space Symposium.**

THE CHANGING patterns of the radiations that may prove hazardous to future space travelers are being charted for nearby space by scientists from information beamed earthward by satellites.

At the First International Space Science Symposium, held in Nice, France, several United States scientists reported results of their space probings to find out how the radiations vary over a period of time and at different altitudes. The symposium is sponsored by COSPAR, the Committee on Space Research of the International Council of Scientific Unions.

The observed changes in intensity of the soft radiation from 4,000 to 29,000 miles above the earth's center were reported by Dr. Alan Rosen of Space Technology Laboratories, Inc., Los Angeles. He said one kind of change found by him and Drs. T. A. Farley and C. P. Sonett, also of STL, involved day-to-day variations in intensity along lines of constant geomagnetic latitudes. The second type of change, observed from 21,000 to 29,000 miles out by Explorer VI, occurs in a time interval of less than a second to a very few minutes.

Streams of particles from the sun, shot out during periods of solar surface activity, may cause "appreciable heating" of the earth's atmosphere, Dr. Robert Jastrow reported. Dr. Jastrow, with the National Aeronautics and Space Administration's Goddard Space Flight Center, Washington, D. C., said the heating resulted from energy transferred to the atmosphere by energetic solar electrons.

Particles trapped in the outer radiation belt are believed to produce a ring current that accounts for many of the magnetic storm effects observed at sea level, a paper by Dr. S. F. Singer of the University of Maryland reported.

These particles are probably from the sun, a report by Dr. James A. Van Allen of the State University of Iowa said. Dr. Van Allen and his co-workers first spotted the presence of earth's natural radiation belts from satellite observations made nearly two years ago.

## Moon's Atmosphere

THE MOON has an atmosphere of cold neutral hydrogen, the basic material of the universe, as well as a minute amount of argon, two U. S. scientists reported to the Space Science Symposium.

Protons in the solar wind bombarding the moon's surface produce both the hydrogen and argon in the lunar atmosphere, the scientists reported in a paper delivered at the symposium. J. R. Herring and A. L. Licht of the National Aeronautics and Space Administration's Goddard Space

Flight Center, Washington, D. C., calculated the density of cold neutral hydrogen as about 40,000 atoms for each square centimeter of lunar surface.

The density decreases very rapidly away from the surface.

## Urge Space Probe

A SPACE probe passing within some 600,000 miles of Mars might show if life exists on the planet.

The probe could scan Mars, sending back to earth information about the spectra in the three to seven micron region, two California Institute of Technology scientists reported to the space symposium. The spectra would be correlated with the visual light and dark areas of Mars, Drs. Richard W. Davies and Max Gumpel said.

Even if not more than a few thousand "bits" of information were transmitted to earth, the experiment would be "significant," Dr. Davies reported.

This is because the earth's atmosphere blocks most of the infrared light in the spectrum band between one and 100 microns. Some breaks in this atmospheric

block have already permitted detection of what may be carbon-hydrogen bond molecules on Mars, indicating the existence of organic life.

Origin of the organic molecules is still an open question, the Caltech scientist said. More infrared reflection spectra of biological materials are needed, particularly in spectral regions where molecules of biological origin have very definite characteristics. Two strong reflection peaks due to carbon-oxygen stretching have been found in the six micron region. This region on Mars could only be tested with a space probe since it is blocked by the earth's atmosphere.

Another suggested space probe experiment is measuring the light polarization of Mars. A single pass around Mars could result in polarization measurements that would give important information on the sizes of particles in the Martian atmosphere, the scientist said.

Nobel Prize winner Dr. Joshua Lederberg of Stanford University suggested that scientists focus attention on extraterrestrial life as sharing two "basic attributes" with life on earth: the use of water as the primary solvent for biochemical interactions and construction from carbon polymers. Mars, Venus and the moon are thus the most "plausible" targets for life outside earth, he told the space symposium. The moon may carry important information on pre-life chemistry in its crevices and deeper layers, Dr. Lederberg said.

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## NUTRITION

## Find Dark Roasted Coffee Contributes Niacin to Diet

YOUR MORNING CUP of coffee may be contributing significantly to your health, a team of Tulane University researchers reported.

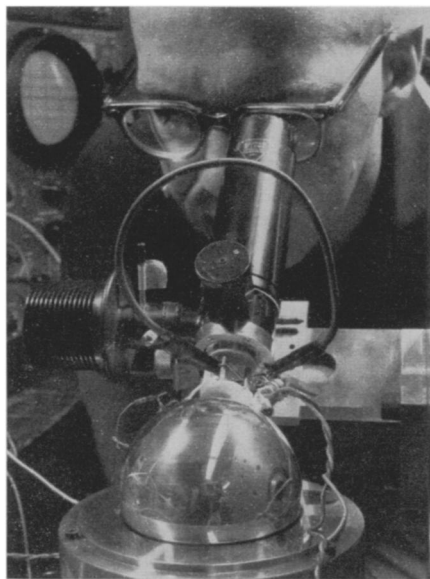
One cup of dark roast coffee contains about three milligrams of niacin, an important B vitamin best known as the pellagra preventive. This is about one-third to one-fourth of an adult's minimal daily requirement. Tests with five adults show that the niacin in coffee is "biologically available for man" and that it is absorbed and excreted in the same way as the pure chemical compound.

Light roast coffee contains less niacin—about one milligram per cup—but could still contribute significant amounts of the vitamin if drunk in sufficient quantities.

The niacin in coffee may help explain why pellagra is not found in some areas where it might be expected to be a serious disease because of vitamin B-deficient diets. Coffee drinking may be the answer, Grace A. Goldsmith, O. Neal Miller, Walter G. Unglaub and Karen Kercheval suggest in the *Proceedings of the Society for Experimental Biology and Medicine* (Dec., 1959).

(Pellagra, now virtually eliminated from the United States, used to be prevalent, particularly in the South. It is characterized by skin lesions, nausea, vomiting and diarrhea and, finally, by central nervous system changes such as dementia.)

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**BERYLLIUM SPHERE**—A scientist examines with a microscope the beryllium sphere that has been machined to a precision finer than 15-millionths of an inch. The sphere forms the rotating part of an electrically suspended gyroscope, expected by Minneapolis-Honeywell scientists to have far greater accuracy than existing forms.