SPACE

Moon Like Blue Cheese?

When an astronaut lands on the moon, he will probably step onto a thin layer of micrometeorite dust rather than solid rock—By Faye Marley

➤ THE MOON'S SURFACE is probably closer to green cheese than to solid rock. Blue cheese may be more accurate than green when an astronaut finally steps off into the rough, dark, opaque material left by micrometeorite bombardment.

Dr. Thomas Gold, director of the center for radiophysics and space research, Cornell University, Ithaca, N. Y., said that the action of micrometeorites on the moon's surface cannot fail to produce at least a thin layer of finely pulverized material like dust.

Surveying present evidence, Dr. Gold said "experimentation with fairy castle packing of dust shows that it is more like a crunchy material" that appears solid. Dense particle packing is possible so that a moon visitor would be able to make his way about in a weightless condition, he reported at Brooks Air Force Base, Texas.

Dr. Gold believes that 90 miles beneath the hot moon surface could be an ice and dirt layer with implications of life—but no mermaids.

The moon's surface according to radar measurements seems to be composed mostly of "featureless gentle slopes."

Among the craters on the moon, Tycho is believed to be the youngest or one of the youngest craters of comparable size. Discovery of the intense radar-scattering property of the crater Tycho has shown it to be more similar to rock than most of the other moon surface, but also that a very thin layer of "underdense" material exists there.

Evaluation tests of the first prototype Apollo spacesuit with portable life support system were reported by Dr. John B. Billingham of the National Aeronautics and Space Administration's Manned Spacecraft Center, Houston, in cooperation with Dr. William C. Kincaide. The entire weight is 50 pounds.

Reduction of the weight probably could be accomplished to under 40 pounds, Dr. Billingham said, but he warned that care must be taken that lightening the weight does not sacrifice efficiency.

One problem is that it is virtually impossible to put on the harness holding the life support system without assistance because it is at present on the back of the suit. Prearranging the harness out in front will be necessary. The same is true of the controls and displays which must be accessible at all times.

The first prototype Apollo suit with life support system was delivered to NASA last October, and tests so far have been primarily centered on the astronaut's comfort, ability to get into the suit, move about in it and control maneuvers.

One important feature, the contaminant control canister, is designed somewhat like an automobile oil filter in that flow is introduced to the center of a cylindrical cartridge and collected at the periphery.

The life support system includes emergency oxygen and a protection garment against heat that will cover the entire assembly from the moon environment. Also included will be a communication-telemetry package.

Fabric of the Apollo spacesuit is aluminized. Basically similar to the Project Mercury environmental control system, the Apollo system is more "sophisticated" because of the many more functions it will perform in a trip to the moon.

• Science News Letter, 85:115 Feb. 22, 1964

Study Long Space Trips

➤ EXPERIMENTS TO TEST how prolonged space travel will affect humans are being designed at the Aerospace Medical School, for use on the proposed manned orbiting laboratory (MOL).

MOL, which is to sustain men in space for up to 30 days, should provide answers to the following:

How long can a man safely remain in orbit?

Can he perform there with his full faculties?

Will physiological changes such as loss of calcium from the bones occur after extended weightlessness?

Can we maintain physical condition for long periods in MOL through exercise, or will an artificial gravity technique prove necessary?

Will a man's physical condition after 30 days in orbit let him withstand the high-g force of ballistic reentry to the earth?

MOL will be launched atop a Titan III rocket. Attached to MOL will be a modified Gemini space capsule, called Gemini B, which will be used as a recovery craft.

Two pressurized compartments are planned for MOL. Each will contain both living accommodations and test equipment. A third compartment may be added to contain support items and perhaps other test equipment.

A two-man MOL launching is planned at first, with rendezvous techniques used if more men are needed for a project in space. The rendezvous problems have not been thrashed out yet.

Once money is appropriated for MOL, about four years will be needed to get it ready for orbiting, said Lt. Gen. James Ferguson, deputy chief of staff for research and development, USAF.

Comparing the entire space program to the voyage of Columbus, Gen. Ferguson told a group attending the Aerospace Medicine Conference, Brooks Air Force Base, Texas, that he has a feeling the U.S. Government is not as soft a touch as Queen Isabella, financially.

• Science News Letter, 85:115 Feb. 22, 1964

United Technology Center

SPACE LABORATORY—This artist's conception shows the Air Force manned orbital laboratory (MOL) being hurled into orbit by USAF Titan III-C launch vehicle which is powered at liftoff by two one-million-pound thrust solid propellant rockets produced by United Technology Center, Sunnyvale, Calif. Astronauts will be able to stay aloft up to a month.

SPACE

Cone Shape Found Best For Reentry From Mars

➤ A CONE SHAPE is probably best for the nose of a space vehicle reentering the earth's atmosphere after a trip to Mars or Venus.

However, the cone shape would be frittered away by the high heat generated during reentry. To prevent this, some methods must be found for replacing the lost material.

H. Julian Allen, Alvin Seiff and Warren Winovich of the National Aeronautics and Space Administration's Ames Research Center, Moffett Field, Calif., believe a replacement method is possible. In a wind tunnel they tested how feeding a solid rod of material through a hole at the tip of the nose cone affected the shape.

This feeding resulted in only a small change in shape of the cone surface, they found, indicating that such a scheme might be very useful for space vehicles returning to earth at high speeds.

Mr. Allen is the scientist who, with Dr. A. J. Eggers Jr., first suggested the use of blunt noses instead of needle-like shapes to dissipate the heat when intercontinental and intermediate range ballistic missiles reenter the earth's atmosphere.

However, the blunt nose will not work for dissipating heat for vehicles returning to earth from interplanetary trips because the speed of the latter is so much greater than for ICBM's and IRBM's. The high speeds are necessary to cut down interplanetary travel time.

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