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DELAYED ISSUE finally published to simplify things for harassed librarians; the rest of the material for these four issues was lost at the time of change in editors.

SPECIAL DECEMBER MEETING ARRANGEMENTS

Guests at the December meeting (Monday Dec. 11) will be Charlie and Jo Larson from Vancouver (Charlie is chairman of the Oregon Grotto) who will present a special program on cave photography, illustrated with some fantastic pictures. Also in attendance will be Hal Foss, new Search and Rescue Director for the state of Washington, for an informal discussion of Northwest cave rescue.

The meeting will begin at 8 PM as usual at the Hallidays (1117 36th Avenue E. at East Madison St.) but there will be a special dinner at 6 PM at the Hong Kong Cafe at 507 Maynard Ave. S. in Chinatown. Estimated cost is $2.50; please call grotto chairman Rob Stitt and let him know how many reservations to make. RIGHT NOW! EA 5-3357!

Moon, earth surface chemistry similar, says Surveyor V

The chemical composition of the surface of the moon appears to be very much like that of the earth's surface in many places. At least that's the indication based on just-released results of the first direct chemical analysis of the lunar surface.

The analysis—by a specially designed alpha backscattering measurement device aboard the Surveyor V spacecraft—indicates that the lunar surface is composed of these elements in these amounts (in terms of per cent of atoms): carbon, < 3; oxygen, 58 ± 5; sodium, < 2; magnesium, 3 ± 3; aluminum, 6.5 ± 2; silicon, 18.5 ± 3; sulfur through nickel, 13 ± 3 (iron, cobalt, and nickel < 3); elements heavier than nickel, < 0.5.

Surveyor V landed on the Mare Tranquillitatis (Sea of Tranquility)—a vast plain near the equator of the moon on Sept. 10.

"The general pattern which emerges from the backscatter data is that the most abundant elements on the lunar surface are the same as the most abundant elements making up the rocks of the earth, and the relative abundance of these different elements is very similar to that of silicate rocks on earth," says chemist Anthony L. Turkevich, who developed the alpha backscatter device for Surveyor V. The kind of terrestrial rock that most closely matches the chemistry of the lunar material analyzed is "one of general basaltic composition" which, he explains, is a volcanic rock found in many parts of the world.

Dr. Turkevich is professor of chemistry at the University of Chicago's Enrico Fermi Institute for Nuclear Studies. Collaborating with him in the development were radiochemist James H. Patterson of Argonne National Laboratory and Ernest Franzgrote of Jet Propulsion Laboratory.

Dr. Donald Gault of NASA's Ames research center, spokesman for the Surveyor Lunar Theory Working Group, ranks the chemical analysis of the lunar surface among "the great scientific achievements of the entire civilization of man.

"Important generic implications arise from a basaltic composition," the group says. A basic material such as basalt is derived by chemical fractionation of an ultrabasic type of rock. Thus, it is highly likely that the moon is differentiated, which means it has a distinct crust and core formation. The scientists believe that the source of heat that caused this differentiation probably came from within the moon.

The possibility that the lunar material analyzed is the fractionated product from a large puddle of melt produced by a monstrous collision that formed the great lunar basins, group members say, is "inconsistent" with the observations that these basins could not have been filled at the time they were being formed. That the lunar surface closely approximates the chemistry of the most common terrestrial basalts, they say, is "consistent with the widely accepted hypothesis that extensive volcanic flows have been responsible for flooding and filling of the mare basins.

"It is gratifying and significant that the chemical composition of the lunar material appears to be most like a common terrestrial rock and that it is not some material composed of an unusual or bizarre mixture of elements," the group says. "Apparently the geochemical processes on earth are not grossly different from their lunar counterparts despite environmental differences between the two bodies. Thus, we have for the first time some direct evidence to support the validity of extrapolating our fund of terrestrial geochemical and geologic experience to the interpretation of the moon and lunar processes."

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No comment this time.