

ASTROPHYSICS

Polarized Light From Planets Shows Their Composition

French Astronomer Compares Reflections From Heavens With Light Given off by Terrestrial Substances

VOLCANIC action on the moon at some time in its past history is indicated by researches here which seem to demonstrate that the surface of our satellite is covered with a thin layer of volcanic ash. Mercury and Mars seem to have a somewhat similar surface.

These results have been obtained by Dr. B. Lyot, of the Paris Observatory, working at the station at Meudon, where most of the actual observing is performed. His method is to study the polarization of light reflected from the surface of the moon and planets. Ordinary light vibrates in all directions, but when it is polarized the plane of vibration is confined to a single plane. As it is reflected from certain substances at various angles, light becomes more or less polarized, in a characteristic manner for different substances. The polariscope used by Dr. Lyot detects the polarization if only one part in a thousand is affected.

The moon and the planets are all illuminated by sunlight. Dr. Lyot measures the polarization as the light shines on their surface from various angles. At one angle the polarization is greatest, and he drew curves showing the extent of polarization at the various angles. This curve is characteristic for each of the planets and the moon. Then he made similar observations of a number of terrestrial substances in the laboratory. These included various kinds of stone, lava, volcanic ash from Vesuvius, snow, water vapor and ice crystals, the characteristic curve of polarization with light from different angles being measured for each.

Volcanic Ash Curve

The volcanic ash, alone of all the substances studied, gave a curve like the moon, lava being quite different. Therefore he comes to the conclusion that there is a strong probability that the moon is covered with volcanic ash. There has been considerable controversy in the past about the formation of the lunar craters. Some have supposed them volcanic, while others have been of the opinion that they resulted

from meteors which hit, penetrated below the surface and then exploded. Dr. Lyot's findings indicate that whatever the cause, there has been volcanic activity on the moon, which has left a layer of ash over its surface.

Mercury, it is found, shows a curve like that of the moon. He finds that if Mercury has an atmosphere anything like ours, it cannot be more than about a fiftieth as thick. This would make ordinary clouds quite impossible, so the white areas that have sometimes been seen have been clouds of dust.

Venus is hard to study, because it seems to be covered completely with clouds, and it is very difficult to study the reflected light from terrestrial clouds of sufficient thickness. However, he states that the results seem to indicate that the light is reflected from tiny droplets, like water and not more than a ten thousandth of an inch in diameter.

When the atmosphere of Mars was clear, it showed a curve very similar to that of the moon. But at times the

curve suddenly changed, and this proved to be due to clouds or mists in the Martian atmosphere. Dr. Lyot states that the polariscope forms a very delicate means of detecting such atmospheric changes. Sometimes white areas have been seen on the edge of Mars where the sun is rising, and these have been attributed to early morning clouds. This theory is not supported by the new results, but they may be due to deposits of frost. Dr. Lyot's results also seem to show that the atmosphere of Mars is not more than one-third as dense as air on the earth, but at the worst is probably more than one-fifteenth as dense as our atmosphere.

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PSYCHOLOGY

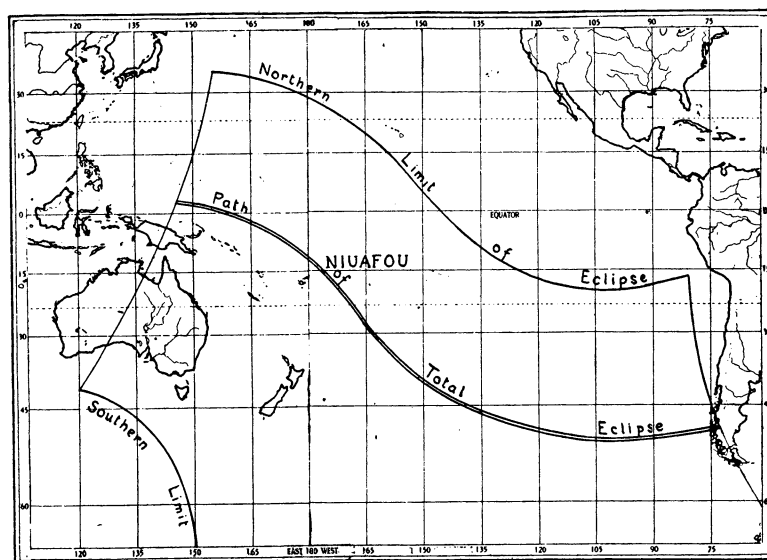
A New Adjective Describing Your Writing, Maybe

IF SOMEONE tells you that your writing is perfectly euphanious, don't throw the inkwell at him.

Dr. C. E. Seashore of the University of Iowa here has just coined this word, and states in a recent issue of *Science* that it is a "high and specific complement."

He has built the noun "euphany" from the Greek word "phaino" which means "to make clear." The new word stands for "the ability for deliberate and adequate statement of fact."

Science News Letter, October 25, 1930



PATH OF THE TOTAL ECLIPSE OF THE SUN

On October 21-22, as it swept across the South Pacific. It started on the western side of the International Date Line on Wednesday, October 22, but ended on the eastern side on Tuesday, October 21. Two parties of astronomers, one from the United States and the other from New Zealand, set up apparatus for eclipse observation. (*Science News Letter, Oct. 4, 1930*). They are on Niuafoou Island, six square miles in extent, on which a new volcano crater broke out last year.