

understanding among scientific fields as different as biochemical genetics and planetary astronomy is a must.

The argument concerning whether or not there might be life on Venus is connected with its temperature, a highly controversial subject. Dr. Lederberg believes accurate measurements of its temperature must be made as soon as possible. Even should the surface be unbearably hot, as many astronomers believe, there may be a more temperate layer at another level.

Conditions on Mercury may be somewhat like those on the moon. However, since Mercury keeps one side always turned toward the sun and the other turned away, its dark side may furnish an even more reliable refuge for space traveling spores than the moon.

Mercury, Venus, the earth and Mars, in that order, are the planets closest to the sun, and are called by astronomers minor planets. The major planets include Jupiter, which is the largest in the solar system, more massive than all other planets combined.

Main Planets Difficult to Visit

In view of their distance, exploring the main planets may be very difficult. Because of Jupiter's large mass, slowing down a space vehicle to land on the outermost planets may be very hard to manage.

However, the fact that they have a high proportion of light elements, which have been bombarded by solar radiation at temperatures and in gravitational fields very different from the earth's, offers "the most exciting prospects for novel biochemical systems," Dr. Lederberg believes.

BIOCHEMISTRY

Gives Scientists Tracer

► BECAUSE OF THE TESTING of nuclear weapons, scientists have in their possession a giant-scale tracer that can be used to study the mechanisms and rates of many natural processes that involve the element carbon.

Several examples of such tracer studies are suggested by Drs. Wallace S. Broecker and Edwin A. Olson of Columbia University's Lamont Geological Observatory at Palisades, N. Y., in a report to *Science*, 132:712, 1960. They also report estimates of the proportion of radioactive carbon available for such studies.

The ratio of carbon-14 (radioactive carbon) to carbon-12 in the atmosphere over the Northern Hemisphere will reach a maximum before 1963 at from 1.3 to 1.4 times the pre-bomb level, the scientists report.

The maximum for surface ocean water will be between 1.09 and 1.15 times the pre-bomb level and the maximum will occur between 1970 and 1975.

By 1980, the ratio for the atmosphere will have dropped halfway back to the pre-bomb level.

Early in the next century, the proportion of radioactive carbon in the atmosphere will be affected more by man's burning of coal and oil than it is by setting off of nuclear bombs. This is due to the fact that such

Since useful landings on other planets are difficult and hazardous, Dr. Lederberg urges that some attention be given to experiments done at a distance. Balloon and satellite-mounted telescopes can reveal much about planetary chemistry and, therefore, biology. Space probes to the vicinity of planets can furnish additional information prior to actual landings.

Earth Would Appear Different

To turn the tables, what could possible intelligent life on other planets discover about the earth with equipment such as is now available on earth?

From Venus, for example, the earth through the telescope would appear very different from any of the other planets. The most conspicuous feature would be its clouds, which on the average cover about half the earth's surface and reflect considerably more light than the surface.

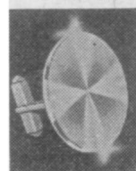
When spotted through the clouds, the most conspicuous surface features would probably be the reflection of the sun from oceans, snow-covered areas and deserts, which would be yellowish or reddish in color if there were little vegetation. The darkest parts of the earth's surface would be the oceans, when not reflecting direct sunlight, and the great forest regions. Cultivated regions and grasslands would appear somewhat green, but only the most general features could be seen. To be seen individually, objects would have to be many miles in diameter, so the chances are against detection of the existence of mankind from Venus.

• *Science News Letter*, 78:218 October 1, 1960

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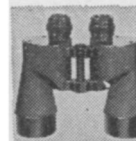
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