

ASTRONOMY

Remake Venus "Weather"

► **MAN CAN LAND** on the mystery planet Venus after making its air suitable for humans. This job could be done by dropping primitive plants into the planet's atmosphere, then waiting for results.

The primitive algae would remove the carbon dioxide believed to poison the air on Venus for humans. The result would be carbon and oxygen.

Dr. Carl Sagan of the University of California, Berkeley, believes the best algae to drop on Venus are the blue-green algae (primarily of the Nostocaceae family).

He said many experiments on developing algae in a simulated atmosphere like that on Venus should be made. Such experiments would show which strain of these algae is better suited to live and reproduce in and to change the atmosphere of Venus.

The seeding of algae on Venus should only come after the existing conditions on Venus have been thoroughly investigated. Otherwise, unique scientific information about the planet might be lost, Dr. Sagan said.

The theories on the kind of "weather" Venus has are many and varied, but all are no more than educated guesses since the planet is covered by a cloud layer that hides its surface. The clouds were once

thought to be formed only of dust, but water vapor has been found to be about as abundant as it is in the earth's atmosphere, Dr. Sagan reported.

Some scientists think the surface of Venus is dry while others believe it is covered with oceans of carbonated water.

The algae first dropped on Venus would live high in the air and use water deposited there in the form of water vapor or ice crystals.

As the carbon dioxide content of the atmosphere on Venus falls because of the algae, the surface temperature, now believed to be 600 degrees Fahrenheit, would begin to fall.

When the temperatures are low enough, the decreasing rate of algal decomposition would reduce the water abundance slightly, and the surface would cool below the boiling point of water, Dr. Sagan said.

At this point surface photosynthesis (by which plants produce food) would become possible. At somewhat lower temperatures rain would reach the surface. A balance would then be established in the atmosphere, and the carbon dioxide would be reduced to the level of earth, Dr. Sagan reported.

This would be the cue for the first

manned space ship to land on the surface of Venus, Dr. Sagan said in *Science*, 133:849, 1961, publication of the American Association for the Advancement of Science.

• *Science News Letter*, 79:213 April 8, 1961

ROCKETS AND MISSILES

Fuel Cells for Satellites Developed by Air Force

► **NEWLY DEVELOPED** fuel cells for auxiliary power in orbiting satellites will soon be flight tested for performance, the Air Research and Development Command at Andrews Air Force Base, Md., reported.

The cells, which operate silently without noxious odors or parts to wear out, would be used to replace present satellite batteries, which run down in only a few weeks.

Each cell is composed of a membrane, or skin, on each side of which there is an electrode. Hydrogen gas is on one side of the membrane and a supply of oxygen is on the other.

Hydrogen and oxygen enter the chambers on opposite sides of the ion-permeable membrane and penetrate the porous electrodes to contact the surfaces of the membrane. The electrons are given up on the hydrogen side, collected in the electrode and conducted to the load. The hydrogen ions travel through the solid electrolyte to the other surface of the membrane and combine there with the returning electrons in the presence of oxygen. Electrolysis of the water back into hydrogen and oxygen makes this a regenerative fuel cell.

• *Science News Letter*, 79:213 April 8, 1961

AERONAUTICS

Plane Used to Correct Best Available Maps

► **THE UNITED STATES** now has a plane that "knows" where it is more precisely than the best available maps and shows how the maps should be corrected.

Primary function of the especially equipped Boeing 707 jet is to check navigational aids at high altitudes. It does this with a fast electronic system that records as it monitors. The records are later analyzed by a ground-based computer.

The system is so accurate that the plane's position with respect to the ground is known within 400 feet at all times. The stations are checked much faster and more accurately than by any previous method.

In a four-hour flight covering 1,466 air miles, the plane checked 35 ground stations from an altitude of 32,000 feet. Preliminary information indicated that there was radio interference between stations at Front Royal, Va., and Charleston, W. Va., although not enough to make a safety hazard.

The plane, which cost \$2,600,000 and is considered a bargain, is operated by the Federal Aviation Agency, which must know how its guidance and other systems for pilot aid are working at high altitudes.

• *Science News Letter*, 79:213 April 8, 1961



CHECKING FLIGHT AIDS—Navigational aids are checked for errors with SAFI (Semi Automatic Flight Inspection), a complex electronic system.