nals should also enable as much as a 500 percent increase in the accuracy of measuring the planet's mass, which, says chief radio experimenter H. Taylor Howard of Stanford University, should make it known as well as the earth's.

Plotting the spacecraft's precise trajectory by means of the signals also revealed to Howard's team that Venus is shaped far more like the classic globe than is the earth, which is flattened by its spinning. Venus, they found, is about 100 times less oblate, or out of round, than the earth, almost certainly because of its slow rotation. If it ever did rotate more rapidly, either that was when the planet was still a plastic, molten mass, or else Venus is a much less rigid body than the earth, capable of returning to its more spherical shape as it slows down.

The slow rotation of the planet also affects the circulation of the atmosphere, since there is additional time for heat to accumulate. The result ought to be simple swirling of the upper levels, as the warmer atmosphere in the tropical equatorial regions moves away toward the cooler poles. Mariner 10's major advantage over its predecessors—its two television cameras—showed the expected symptoms, again by ultraviolet light. Roundish features in the top cloud layer suggest cells of convection heating below, but, says Verner E. Suomi of the University of Wisconsin, the source of the heating, whatever it is, is probably still somewhere above the surface. (A similar theory of a free-floating vertical cell has been suggested to account for the Great Red Spot of Jupiter.) The symmetry of the equatorial circulation, says Suomi, resembles that of the intertropical convergence zone on earth. The cameras, says TV team leader Bruce Murray of California Institute of Technology, clearly show at least three cloud layers, and possibly a fourth.

Despite the answers provided by Mariner 10, there are a vastly greater number of questions about earth's mysterious sister with her layers of concealing veils. "Anybody with that much on," says Howard, "must have a lot to hide."

The spacecraft's main objective, however, is a March 29 flyby of Mercury, possibly as close as 621 miles. Plans call for Mariner 10 to be sent, in a prodigious feat of navigation, through a pyramid-shaped zone of Mercury's shadow, in which the planet hides the spacecraft from both earth and the sun. This is the only way, officials say, that Mariner would be in a position to detect possible tenuous traces of an atmosphere, ionosphere, or trapped radiation or charged particles from the solar wind. On the sunlit side of the planet, they would be invisibly scarce. □

A successful end to the longest space mission

NASA

Home at last, Skylab's last crew showed no nausea, little shakiness or vertigo.

TELEM TM OFF

The last command. At 2:10 p.m. EDT on Feb. 9, Skylab received its final instruction, to turn off its telemetry transmitter, from the Houston mission control center that had monitored the space station night and day for more than eight months. After 3,897 trips around the earth, a distance of more than 100 million miles, Skylab was officially dead.

The crew were far from it. Astronauts Gerald Carr, William Pogue and Edward Gibson, space rookies all, had returned to earth some 22 hours before, bearing an estimated two tons of scientific data and feeling, said Carr, "prettty damn good." NASA medical officials, in fact, proclaimed that this third and final crew was in better shape than either of its predecessors, adapting readily to the gravity that they had deserted 84 days, one hour and 17 minutes before.

Before leaving their orbiting home, the astronauts left behind them a "revisit bag," containing samples of food, film, paper, clothing, electronic components and other gear, just in case crewmen from the 1975 Apollo-Soyuz flight or the space shuttle in 1979 or beyond should drop in at the lifeless station and retrieve the bag. Studies of the bag's contents could yield valuable data on possible long-term degradation caused by factors such as radiation in the space environment.

Just before leaving the station, the astronauts fired its motors once more to raise its orbit slightly, to ensure that it will still be aloft at shuttle time. Under consideration is a plan to have shuttle-borne astronauts deliberately send Skylab earthward, to make sure that it will not land in a populated area.

The three Skylab crews together spent more than 171 days in space, took almost 230,000 frames of film of the earth, sun and stars, and recorded more than 45 miles of data-crammed magnetic tape.

One of Skylab's most important contributions toward long-term flights such as a manned mission to Mars was the discovery that there seems to be a leveling-off point, after about a month, beyond which weight loss and other deconditioning effects of weightlessness reach a plateau. Carr's crew, with the world's longest space flight behind it, showed little strain back on earth. It bodes well for spacemen to come. □

Experiment confirms laser-fusion idea

It could be said that the idea of laser-induced thermonuclear fusion was born in a computer. The basic scheme is to take a pellet of deuterium and tritium (or other appropriate fuel) and irradiate it from all sides with laser light. The belief that the energy deposited by the light would cause a symmetric implosion, compressing and confining the pellet and thus preparing the way for the ignition of fusion, was based on a model generated by a computer. At last week's meeting of the American Physical Society in Chicago came news of experimental confirmation of the computer model.

The news was brought by Keith A. Brueckner of KMS Industries, one of a small number of organizations working on the concept. Two days before Brueckner addressed the meeting, the U.S. Atomic Energy Commission obligingly declassified the results. (Most branches of thermonuclear fusion research are not classified, but laser fusion has potential military applications, so it is.)

The implosion, described as "significant reduction in volume," was observed in a series of low-power laser shots designed to test the performance of what KMS calls its stacker, a device that shapes and times laser pulses to get optimum energy delivery to the target. The pulses were not at a high-enough power level to produce fusion and were not intended to be.

The observations were made by X-ray pinhole photography. This is a technique that uses X-rays emitted by the fuel pellet and the principle of the pinhole camera to form an image of the pellet as it is compressed.

The compression was obtained with