

PLANETOLOGY

Evidence for a core in Mars

One hundred years of earth-observations of the planet Mars had revealed it to be similar to the earth in many respects, but vastly different in others. Man got his first close-up look in 1965 when Mariner 4 flew within 6,118 miles of the planet. Now as a result of data analysis from Mariners 6 and 7 (which flew within 2,000 nautical miles of Mars in 1969) it now appears that Mars may be more earth-like than originally thought.

The new data reveal that Mars has a core and that it is probably at least partly molten, says Dr. Don L. Anderson of the California Institute of Technology. Before the occultation experiments performed with the Mariner craft, the precise diameter of the planet, its density and the presence of a core were uncertain. Dr. Anderson measured the precise diameter as 4,208 miles and determined the gravitational pull of the planet on the spacecraft and Mars' two small moons. These coupled with the measurement of Mars' moment of inertia—how its mass is arranged around its axis, including the flattening at the poles—indicate that it is a differentiated body like the earth and has a mantle and core and possibly a crust.

"The core of Mars is much less dense than the earth's but its mantle is denser," says Dr. Anderson. "Indications are that all the core of Mars hasn't yet separated from its mantle . . . which implies that Mars hasn't gotten hot enough to melt all the iron, sulfur and nickel, which are the core-forming materials," he adds.

Two Mars orbiters, Mariner 8 and 9, to be launched this month should further refine the data. The first craft was tentatively scheduled to be launched on May 8 or 9.

NASA CONTRACT

Venus-Mercury spacecraft

In 1973 the National Aeronautics and Space Administration will launch its first spacecraft to the planet Mercury. The craft, Mariner 10, will fly by Venus at a distance of 3,000 miles and use the gravitational pull of that planet to propel it on to within 600 miles of the closest planet to the sun.

Last week NASA announced that Boeing of Seattle had been awarded the \$47 million contract to build the new Mariner. Mariners 2 and 5 flew past Venus in 1962 and 1967 respectively. Mariner 10, however, will be the first craft to fly past two planets and will transmit the first television pictures of Mercury.

BACK CONTAMINATION

Lunar quarantine dropped

Cosmic pollution may work two ways. Spacecraft and men from earth can contaminate space or other planets with earth-related material and organisms. But there is also a chance that material returned from another celestial body could contain something harmful to the earth.

To prevent the former, lunar and planetary spacecraft and experiments are sterilized. And to guard against the latter in the Apollo program, the astronauts, their tools,

spacecraft and lunar samples have been isolated after the lunar trips and examined for harmful effects.

Last week the National Aeronautics and Space Administration announced it will put into effect the recommendation of the Interagency Committee on Back Contamination that "further lunar missions need not be subject to quarantine." The conclusion that "there is no hazard to man, animal or plants" from anything brought back from the moon eliminates the three-week quarantine for the astronauts after their return. But the lunar samples will continue to be protected from earth contamination to insure their integrity for research.

NASA POLICY

Humphreys resigns

What to do with life sciences—especially space biology—at NASA has been a thorny problem throughout that agency's history. The sciences were once united in one office, then divided among three—the offices of manned space flight, science and applications and advanced research and technology. Because of the inherent difficulties with biological experiments in space, they almost always played second fiddle to the physical sciences.

As criticism from both Congress and the National Academy of Sciences continued to mount, NASA, as had been expected, reorganized its life sciences activities again (SN: 11/14/70, p. 389). In December they were consolidated into one office—Life Sciences—this time in the office of manned space flight. Maj. Gen. James W. Humphreys Jr. was appointed director (he had been director of space medicine). His new duties involved coordination of biomedical and bioscience research, associated flight experiment definition, advanced life support and protective systems, man-machine interaction, and advanced bioinstrumentation.

Now the new office is losing its director. Dr. Humphreys has announced his resignation effective at the end of May to become the secretary-treasurer of the American Board of Surgery in Philadelphia. While Humphreys was director, space biologists were assured that their discipline would survive in manned space flight. Now they aren't.

AERONAUTICS

Langley gets new simulator

A new flight simulator that permits simultaneous study of two aircraft in maneuvering flight went into operation last week at NASA's Langley Research Center in Hampton, Va. The Northrop Corp. was the prime contractor.

The Differential Maneuvering Simulator (DMS) will be used to evaluate aerial combat capabilities, missile avoidance, air collision avoidance, aerial refueling, formation flight and space rendezvous and maneuvering. It will also provide evaluations of new aircraft designs as well as current ones.

Until now, much of the study of how two vehicles maneuver with respect to each other could be accomplished only in actual flight—too late to aid in structural design. (Two similar simulators are used by LTV and McDonnell Douglas.)