

ASTRONOMY

'Canals' May Be Craters

The so-called 'canals' on Mars, which some astronomers have reported seeing, could be an optical illusion resulting from tiny aligned craterlets—By Ann Ewing

► TINY CRATERS lined up in rows could be the reason some astronomers have formerly reported seeing so-called canals on Mars, although others of equal reputation did not see them. The Mariner 4 photographs show no signs of canals.

That the controversial canals are optical illusions has been suggested for many years. However, the discovery that Mars is crater-pocked much like the moon brought the suggestion from one scientist that the optical illusion could be caused by aligned craterlets.

An experiment to test this idea will probably be among the many stimulated by the magnificent Mariner 4 photographs of Mars which indicate that it is a dead planet and has been for two to five billion years.

Since Mars shows no signs of ever having had water, the chances of any form of life there are considerably reduced. Most scientists believe that water is essential to the origin of life within the solar system.

Another scientist, after his first good look

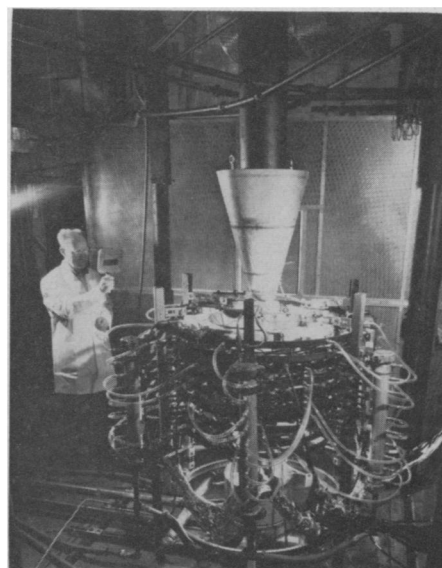
at the 21 Mariner 4 photographs, suggested that the best way to investigate Mars would be to study the moon in considerably closer detail than can be done from the Ranger lunar pictures.

His reasoning is that the Martian surface structure seems so similar to the moon's that there is no reason to travel an extra million miles to study it. He said that "we will know a lot more about Mars when we have a better understanding of the moon."

Before landing a man on the moon, the U.S. space schedule calls for nine more manned Gemini flights, at least seven unmanned Surveyor lunar landings, and five to ten camera-equipped Lunar Orbiters. The first of the unmanned Surveyor flights, which will be an engineering test, is scheduled no earlier than this October.

The National Aeronautics and Space Administration is planning to launch all of the above missions within the next five years.

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Boeing

TEMPERATURE TEST—A Boeing research engineer watches the effects of high temperature on a model reentry vehicle. Circulating water under the porous "skin" of the model dissipates heat in the form of superheated steam. Called transpiration cooling, the concept is similar to human sweating.

The radio observations of the object, known as CTA-21, were made by Drs. R. W. Clarke and R. A. Batchelor of the Commonwealth Scientific and Industrial Organization, Sydney, Australia. Only the disappearance of the radio source could be observed, the scientists reported in *Nature* 207:511, 1965.

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SPACE

Spacecraft Design Lags

► AS THE AIR FORCE and the National Aeronautics and Space Administration continue to look for bigger and better space boosters, spacecraft designs fall farther and farther behind in their ability to take advantage of all the available payload-lifting strength.

High officials from both Government and industry have expressed remarkably similar opinions in San Francisco at a national meeting of space scientists.

"We haven't yet learned to make use of our booster capacity," said Brig. Gen. Joseph Bley Meyer, in charge of space research for the Air Force.

Speaking from the supplier's side of the budget was L. M. Tinnian, spacecraft systems director for North American Aviation, Inc. He said that this country currently could not use the huge Saturn V, super-booster being developed for the Apollo moon landing, even if it wanted to.

Far-out projects such as 36-man space stations on huge, self-deploying satellites could be launched aboard Saturn V, he said, "but what would we fill them with?"

One space scientist, H. L. Thackwell Jr., a consultant from Redlands, Calif., challenged the space industry to help NASA and the Air Force find new, but "needed," large payload missions that could economically use large solid propellant boosters such as clusters of the 156-inch and 260-inch motors now under development.

By the time the Saturn V is ready, there should be more than enough for it to do, assured Mr. Tinnian. After Apollo there will be various interplanetary flights, both manned and unmanned, and even the smaller space probes will use all of Saturn V's power to obtain the high speeds necessary for "reasonably short" trip times.

An example of such a high-energy, low payload mission would be a Mariner-style Jupiter flyby that would reach its goal in a year (Mariner required eight months for its trip to Mars).

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ASTRONOMY

Radio Noises From Sky Have No Visible Source

► THE SOURCE of radio noises from some anonymous object in the sky has not yet been identified.

Radio astronomers in Australia made the best possible determination of the position from which the radio waves are received by checking how the radio signals were cut off when the moon passed in front of the source.

However, even with the improved radio position, no visible object has been found on the best photographs taken with the world's most powerful telescope, the 200-inch instrument atop Mt. Palomar.

TECHNOLOGY

Cooling System Allows Spacecraft to 'Sweat'

► A NEW COOLING CONCEPT is expected to "sweat" a spacecraft back through the searing heat of reentry.

Using a system called transpiration cooling, a space vehicle would have a porous metal skin cooled during reentry by water circulating under the surface and supplied from internal storage chambers. Reentry heat would be dissipated in the form of superheated steam. Advantages of the transpiration system over ablation and radiation systems would be low weight and cost, plus the ability to reuse the system for additional space missions.

Water transpiration systems could probably be used today, said its designers, for small vehicle surface trouble spots such as nose caps, leading edges, control surfaces and places where the vehicle is joined and must be designed for interface shock which causes local hot spots.

Three scientists from the Boeing Company's Aero-Space division, Seattle, R. W. Evans, F. J. Crossland, and W. A. Baginski, developed the system.

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