

Four Centuries of Mars-Watching

From the earliest astronomers to the latest spacecraft, Mars has caught the eye

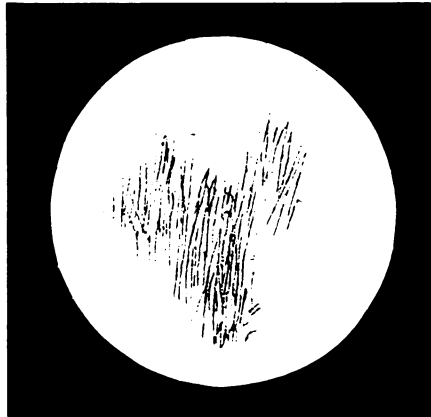
Mars is not the nearest planet to the earth, but it is probably the most studied. Venus comes nearer, but it has always been a difficulty to observers. Venus's alternation between morning and evening appearances confused the ancient Greeks into thinking it was two planets, and the two names, Cythera for the morning star and Hesperus for the evening star, still sometimes appear in poetry. When telescopes came, Venus proved a disappointment: All that could be seen was a formless whiteness, the famous clouds. Even now Venus is known as the mysterious destroyer of space vehicles sent to find out what we do not know about its surface.

Mars, on the other hand, has always been more straightforward. Its conspicuous red identity made it a staple of ancient observation and an astrological portent of all manner of things. Supposedly, the ancients named it for its color, which reminded them of blood or iron or both. Its prominent back-and-forth wanderings in the sky were one of the chief supports for Ptolemaic celestial kinematics with its complicated cycles and epicycles.

When telescopes came, they not only revealed its two satellites, Phobos and Deimos (Fear and Panic), but also showed that through its thin and usually clear atmosphere its surface lay open to observation. Or did it? The earth's atmosphere had something to say about that. Just as air turbulence in the heavy terrestrial envelope causes the images of stars to shimmer and twinkle, so it causes the surface features of planets to dance and twist.

The result is that rarely have two ob-

BY DIETRICK E. THOMSEN



Christian Huygens: First map of Mars.

servers agreed as to what they saw on Mars. Photographs are little help. Being necessarily time exposures, they are even fuzzier. Occasionally, however, the watching eye gets what it at least thinks is a sharp glimpse, and from such observations numerous maps have been laboriously compiled.

The first attempt at a map was that of Dutch physicist-astronomer Christian Huygens, drawn on Nov. 28, 1659. It was done with a crude early telescope (barely 50 years after Galileo's instrument) and is an extremely sketchy sketch, but it does show the triangular feature known to moderns as Syrtis Major.

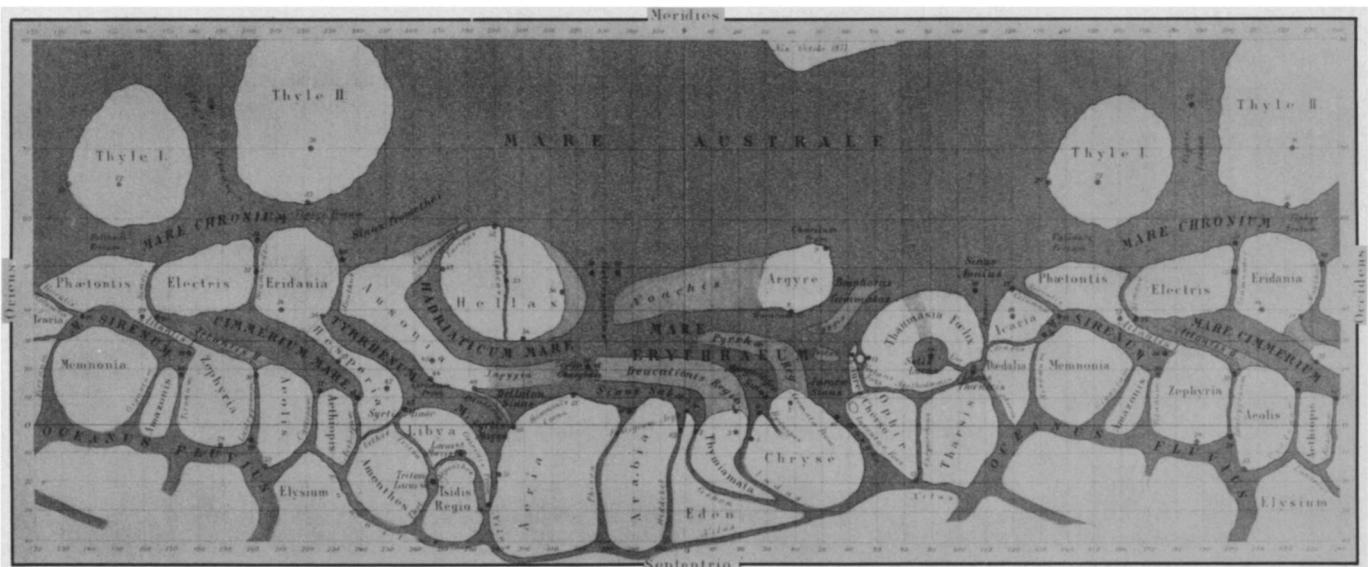
The great era of observing by eye and drawing maps came with the large and fairly sharp telescopes of the 19th century. Of the observers of that period, Giovanni

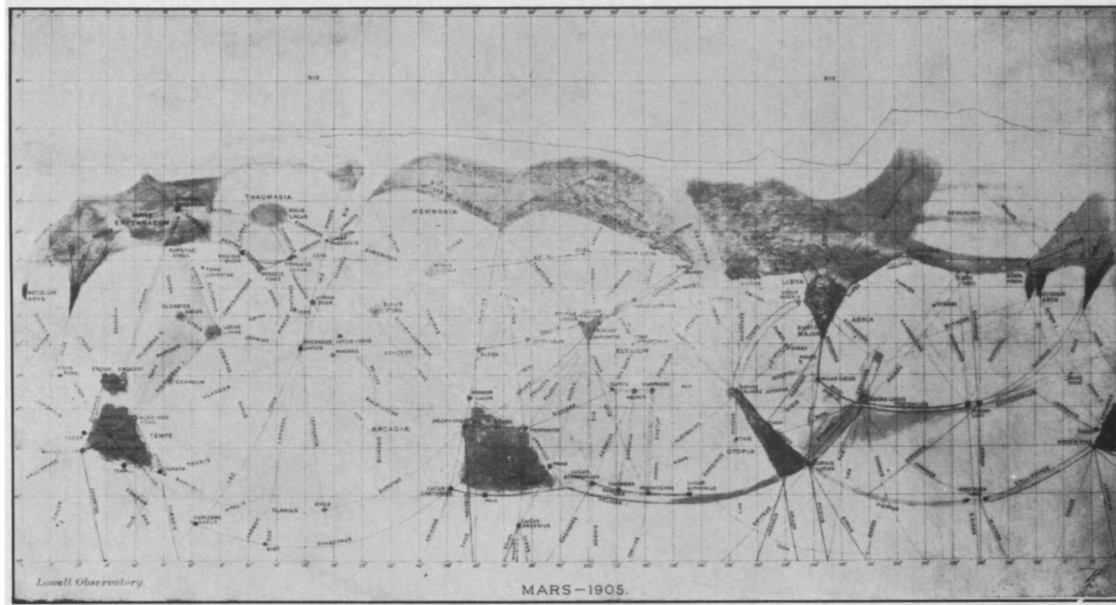
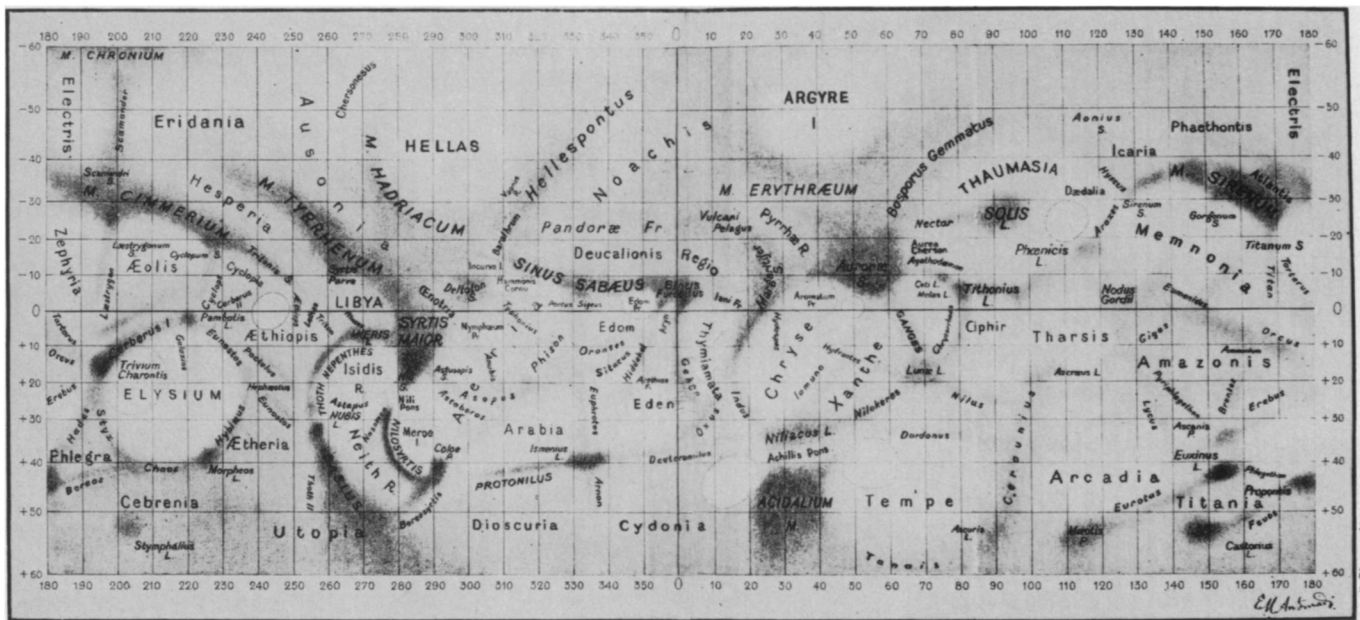
Schiaparelli, who observed from 1877 to 1886 and published his map in 1890, is probably the best known. It was he who started the business of the canals. He observed—or thought he observed—thin lines running over the surface of the planet. *Canali* was a straightforward enough word to use in Italian. It simply means channels, and the canals of Venice are natural waterways. But it does suggest water, and its cognates in other European languages suggest engineering artifacts.

Schiaparelli's work, combined with other things learned about the planet during the period, started a scientific controversy that lasted three-quarters of a century and inspired a good deal of science fiction. Studies of stellar occultations by Mars had confirmed the existence of an atmosphere. Spectroscopy had contributed some knowledge of the planet's atmospheric components and of the surface temperature.

Those who believed in canals, including Percival Lowell, one of the more controversial figures of early 20th-century astronomy, could put all this together into quite a geography. The canals had been built, they said, by intelligent beings to bring water from the polar caps to the desert regions at midlatitudes. (The caps were seen to wax and wane with the Martian seasons, so it was obvious that they were made of something that melted and froze. Carbon dioxide was obvious, but there could also be water.)

The canals themselves were too narrow to be seen from earth. What one presumably saw were the strips of vegetation along their margins. Cities were located





Early maps of Mars include the work of Schiaparelli (1877-78, facing page), who inadvertently triggered the "canal" controversy as well as much of today's Martian nomenclature. Antoniadi (1914-22, above) declaimed artificial canals as optical illusions, but not before Lowell (1905, left) added his considerable reputation to the list of other Martian structural engineering believers.

at their junctions, etc., etc. Science fiction writers ran off with this picture, and we have been treated to generations of Martian Cleopatras barging along the canals and doughty warriors, usually scantily clad and armed more or less a la ancient Greece, fighting rival cities for a share of the precious water.

There were always observers who couldn't see the canals. The controversy was one of the hottest in astronomy and sometimes led to accusations of crackpottery. But it continued right down to the days of the Mariner orbiters. So did the practice of drawing maps. One of the more recent ones was done by E. M. Antoniadi and published in 1930. It does not look very canal-y. According to Patrick Moore and Charles A. Cross (*Mars*, New York, Crown Publishers, Inc., 1973), it was one of the best ever and conforms rather closely to what the Mariners found.

Meanwhile spectroscopic studies of the

planet's surface chemistry improved. The water got less and less; the atmosphere became thinner and more poisonous to terrestrial sorts of life, and the temperature got more and more frigid. Mars began to seem an unlikely place for people running around in short kilts and athletic shirts.

The canal business got the coup de grace from the Mariner 9 orbiter. As Cornell astronomers Carl Sagan and Paul Fox pointed out (SN: 8/16/75, p. 105), "the vast bulk of classical canals correspond neither to topographic nor to albedo features, and appear to have no relation to the real Martian surface." J. L. Inge of the Planetary Research Center at Lowell Observatory recently prepared a map combining topography from Mariner with albedo features from earth-based photographs made in 1969 and 1971. Except for a few vast, generalized features such as Syrtis Major (which seems to show even on Huygens's early sketch) and the

enormous canyon system near the Martian equator, the correlation is inconsistent at best.

What Mariner 9 did find was a cratered, dust-deluged, inhospitable-looking world. It revealed some sinuous features (see p. 366) that certainly seem to suggest that they were made by flowing liquid something, but those same twists and turns are proof of their natural origin. Yet so strong is tradition that we still insist on searching for life on Mars, be it even the tiniest microorganism.

If Viking touches down successfully, its landing will be a culmination of millennia of speculation and observation that began on the hillsides of ancient Greece and the ziggurats of Babylonia. We will at last have our steel fingers in the dirt of Mars, with regular reports of the data accruing therefrom. That is, if those kilted spear-carriers don't smash up our landing craft. □