ASTRONOMY

Michigan Astronomer Sketches All Sides of Planet Mars

Drawings Show Markings That Have Been Called Canals And Patches That Change Color With Changing Seasons

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THE appearance of the planet Mars, now making a close approach to the earth, is shown in the accompanying sketches. They show the way the planet looks during a complete rotation.

Since the rotation period of Mars is only 37 minutes longer than that of the earth, it is necessary to select drawings made over an interval of about a month to show a full rotation. For the same reason, it happens that the sketches run backward in time,—that is, when arranged in the order in which the features would appear in the course of a rotation of Mars, the features which would come into view later were observed on an earlier calendar date.

The main features shown are:

The south polar cap is represented in the sketches as white. It is at the top, since the telescope gives an inverted image. This feature is believed to be snow, since it grows and shrinks with the progress of the seasons on Mars. Of course, carbon dioxide snow has been suggested, but measures of the temperature of Mars now seem to favor the hypothesis that it is snow formed from water. At present the cap is of intermediate size. It has shown some shrinkage during the past several weeks, but it still is due to shrink to much smaller size during the next couple of months.

The general light-colored surface of the planet appears reddish in the telescope, and is represented as very light gray in the sketches. Its color remains the same at all seasons, and it is believed to be desert. The reddish color would be due to high iron oxide content of the surface rocks or sand.

The dark areas appear grayish or greenish-gray in the telescope, and are represented in the sketches by various shades of gray darker than the general surface of the planet. The time interval covered by the sketches is not sufficient to show any of the strong seasonal changes which occur in these markings. They get darker and greener during the Martian summer, and become a dead brownish color and fade out in the winter. This has suggested the hypothesis that they represent the growth of vegetation,—a very plausible interpretation.

The most conspicuous of these dark markings is the Syrtis Major, which appears on the first three sketches. One of the most striking, though it is small, is the "forked bay" (center of sketch at extreme right of row on this page) which appears very dark when it is in good position. There are several faint lightish streaks across some of the dark areas. Their brightness is not so high as that of the general surface of the planet, but their color is similar to it.

There are some "islands" of light color in the dark. One of these, called Hellas, was particularly subject to frosts several weeks ago. When that area first appeared from the night side of the planet it was bright like the polar cap, but in a couple of hours it would change to the same dull color as the rest of the surface, due to the disappearance of the frost as the sun rose. The season of frosts in Hellas is now past,—it has been of just ordinary brightness recently.

One feature of interest about the dark areas is the evidence they furnish of the existence of an atmosphere about Mars. When a very dark patch like the Syrtis Major is close to the edge of the disk, it does not appear at all as dark as when it is near the center of the disk. This is due to scattering of light by the greater thickness of atmosphere in the line of sight when one views the edge of the disk.

200 Miles Wide

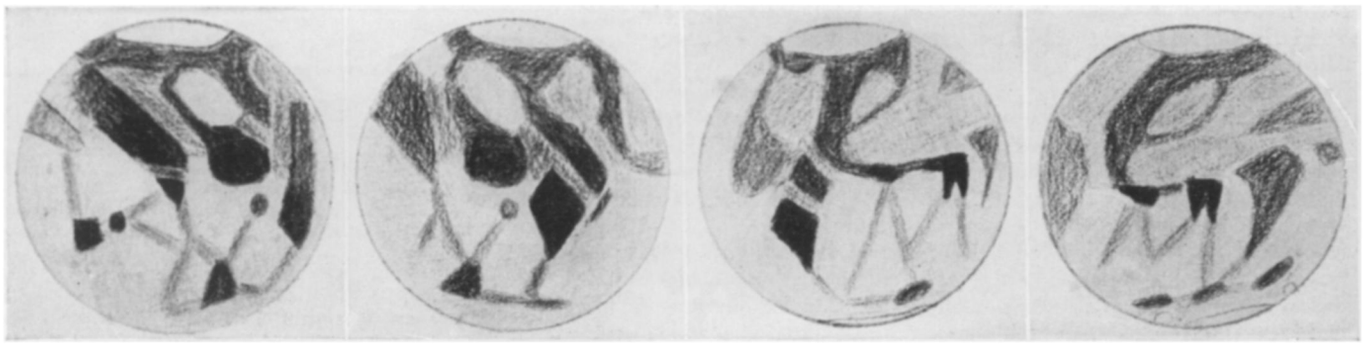
The canals are represented on the sketches as diffuse grayish streaks. At the telescope they appeared about as wide as they are drawn. I have not seen any narrow fine lines at all. It should be borne in mind that the canals shown on the drawings have widths of *a couple of hundred miles*.

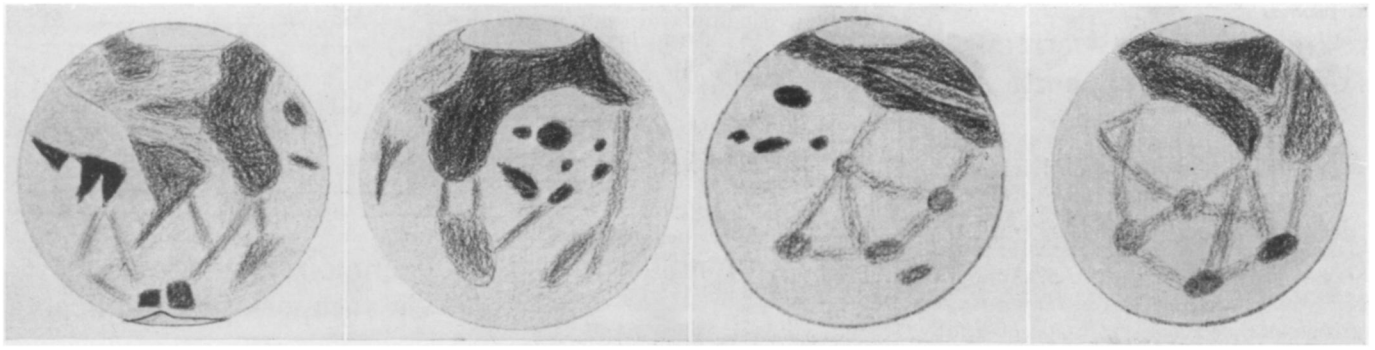
It cannot be denied that there is *something* there. The canals are positively not, as some claimed in past years, purely a figment of the imagination. This statement of their reality, however, must not be taken as implying that they are really of the same nature as the drawing would indicate.

The drawings show the way they *appeared* to the observer. They appeared similarly to a couple of other observers who viewed the planet and recorded them without consulting me at all. But such agreement between observers may mean simply that most human beings

MARS' MARKINGS

The sketches here and on the facing page were made by Prof. Dean B. McLaughlin, University of Michigan astronomer and show all sides of the planet Mars, now making a close approach to the earth. Because the Martian day is only slightly longer than the rotation of the earth's 24 hours, sketches of a whole rotation of our neighbor planet had to be made over a month's time. Times of observations are as follows, left to right: July 19, 12:30 a. m.; July 19, 2:35 a. m.; July 11, 1:20 a. m.; July 7, 12:50 a. m.





SEEN BY ASTRONOMER

These drawings complete the series shown on the facing page. Left to right: July 7, 3:10 a. m.; July 2, 3:45 a. m.; June 26, 2:30 a. m.; June 25, 4:15 a. m. All times are Eastern Standard.

are constituted alike, so that they see things alike.

It is distinctly possible that the canals *are not* long and approximately straight streaks, but simply a result of the running together of fine details which are beyond the powers of resolution of the instrument.

It is possible that *some* of them are actually long streak-like areas. For instance, a mountain chain eroded down until it presented rather low relief (lower than that of the present Appalachians) might appear to an observer 36,000,000 miles away as a long and roughly straight streak. Likewise, a broad river valley with its border of vegetation (The Mississippi or Amazon!!) might appear as a long and roughly straight streak. I do not wish to imply that there are either mountains or rivers on Mars, but I do wish to state emphatically that the idea of actual irrigation canals appears to me absurd. This is, of course, simply a personal opinion, and is not capable of proof at the present time, and perhaps the less said about it the better.

These drawings cannot compete with observations made by Mars experts with larger instruments. I am not a Mars expert, but only a beginner so far as Mars is concerned, working with a 10-inch and a 12-inch refractor. The far southern position of the planet is an additional handicap, since it means that one must view it through a great thickness of the earth's atmosphere. So these observations are definitely in the amateur class. However, they are of interest as indicating what a non-expert with a telescope of only moderate size can see on Mars at this opposition.

One of the surprises in connection with these observations was the ease with which some of the most conspicuous canals can be seen. But possibly a larger instrument would resolve the fine detail and the appearance of linear streaks would then vanish. In fact, during occasional moments of very good seeing, I have suspected the beginning of such resolution,—there has been the fleeting impression that what I saw as a broad streak was actually a very intricate mass of detail just beyond the resolving power of the instrument.

Science News Letter, August 5, 1939

GEOGRAPHY

Yellow River Flood Will Be More Damaging Than War

Transportation and Other Facilities Necessary for Control Said To Be Cut Off by War; Millions Affected

THE TREACHEROUS, silt-laden Yellow River, "China's Sorrow," will go on a flood rampage in a few weeks in the no man's land between contending Japanese armies and Chinese guerillas which will exceed the war itself in destructiveness, Norman D. Hanwell of the American Council of the Institute of Pacific Relations, predicted.

The river's new course, which it carved out for itself last year in one of its periodic shifts, is too small to take care of the flow of water from summer rains, he said.

Twelve million people in the province of Kiangsu, in one corner of which Shanghai is located, will eventually be dispossessed and forced to move because the land on which they live is below sea level and is also in the river's way.

"There is little hope that the river can be returned to the bed from which it so recently fled," Mr. Hanwell declared. "On former occasions efforts to force the river back to its 'proper' bed were under way long before it was able to form a definite new channel of its own. In addition, those charged with the responsibility of controlling the rampant river had certain facilities at hand which are no longer available. Access to transportation facilities and materials necessary for curbing the river are now cut off by the war. The most serious breach remains, it is reported, in the 'no man's land' between the Japanese and Chinese 'lines'. So long as hostilities continue . . . it appears unlikely that effective countermeasures can or will be taken to avert an otherwise almost inevitable catastrophe."

Last year the Yellow River caused enormous destruction when it changed its course, usurped the beds of two other rivers and ended up by flowing through the Grand Canal into the Yangtze River. The Yangtze, itself in flood due to melting western China snows and dykes cut by fighting armies, backed up and overflowed Lake Poyang as a result.

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● RADIO

Dr. Henry B. Allen, director and secretary of historic Franklin Institute, will be the guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, August 14, 5:45 EDST, 4:45 EST, 3:45 CST, 2:45 MST, 1:45 PST. Listen in on your local station. Listen in each Monday.