ASTRONOMY

Mars Approaches Earth

The red planet and Jupiter are both visible on March evenings. An eclipse of the sun, not visible in North America, will occur on March 18.

By JAMES STOKLEY

➤ BRIGHTEST object visible in the heavens on March evenings is the star Sirius, the dog star, shining in the southwest in the constellation of Canis Major, the great dog. Nearly as brilliant is the planet Mars, which makes an approach to earth in March. Early in the evening it can be seen low in the east, in Virgo, the virgin. Its brightness and red color make it easy to locate. In the last half of March it is in opposition to the sun, i. e., it is directly opposite the sun, and rises at sunset. At that time it is within 60,360,000 miles, closer than for several years, and that is why it shines so brightly.

The accompanying maps show the arrangement of these, and other celestial bodies, as they appear around 10:00 p. m. your own kind of standard time, at the first of March, and an hour earlier around the 15th. The particular position of Mars that is shown is that which it has on the 15th of the month, but it is in the same general part of the sky all month.

Above and to the right of Mars is another planet, Saturn, which is about a fifth as bright, though still equal to most of the stars. It stands in the constellation of Leo, the lion.

Visible Stars

Among the other stars to be seen these evenings, Capella, in Auriga, the charioteer, comes second in brilliance to Sirius. It appears high in the northwestern sky. Between Capella and Sirius are a number of bright stars, including those in the constellation of Orion, the warrior, which can be recognized by the three stars in a row that mark his belt. Betelgeuse is the bright star above the belt, while Rigel is below. To the right of Betelgeuse is Taurus, the bull, with Aldebaran, another star of the first magnitude.

Toward the south, above the great dog, is the smaller, Canis Minor, also marked by an orb of the first magnitude, Procyon. And above this figure we find Gemini, the twins, with Castor and Pollux, the latter being the brighter of the pair. In the southeast, above and to the right of Saturn, and the brightest star in the lion, Regulus can be located. It marks the end of the handle of a smaller group called the sickle. Virgo, the group in which Mars is now standing, also contains a first magnitude star—Spica. But it is so near the horizon, at the times for which the maps are drawn, that its light is considerably dimmed by the great thickness of atmosphere through which it has to pass. As Spica climbs higher, later at night, its brilliance is increased.

Mercury, nearest of all the planets to the sun, cannot be seen at all in March. However, two other planets are morning stars, shining low in the east just before the sun rises. One is Venus, most brilliant of all, which exceeds Mars by about 40 times. The other is Jupiter, which comes up after Venus, and is a little brighter than Mars.

Direction of Planets

All the planets, like the earth, revolve about the sun. Venus and Mercury move in orbits that are smaller than ours, so they can never come into opposition with the sun. The outer planets—Mars, Jupiter and Saturn, as well as the others which cannot be seen with the naked eye, Uranus, Neptune and Pluto—swing all around the sky. Sometimes they are in the same direction as the sun. Then, by their own movement, combined with that of the earth, they can travel to the opposite direction, to the position known as opposition. When in the same direction as the sun their distance from us is equal to the sum of their own distance from the sun and that of the earth, about 93,000,000 miles. At opposition, on the other hand, they are closest. Then, to find how far they are from earth, you subtract 93,000,000 miles from their distance from the sun.

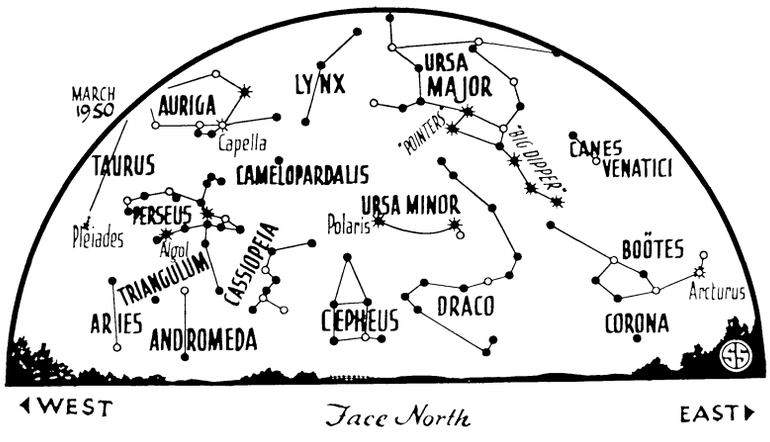
The orbit of the earth is nearly circular, varying only about 3,000,000 miles from the mean. Jupiter's orbit, likewise, is not far from a circle, as its distance from the sun varies some 23,000,000 miles from its mean 483,900,000 miles. Saturn's orbit is more elliptical, with a variation in solar distance of nearly 50,000,000 miles either side of its mean value of 887,100,000 miles. If an opposition happens to occur at the greatest distance, it may be more than a billion miles from us, though an opposition while closest the sun may bring it to within less than 750,000,000 miles. Saturn is in opposition on March 7, and quite close, only 778,500,000 miles away.

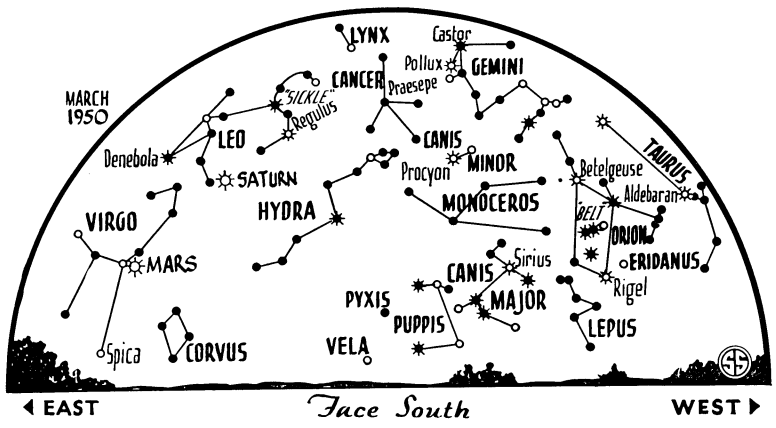
Clue to Martian Canals

Mars, likewise, undergoes a great change in distance from the sun. Its orbit is more elliptical even than Saturn. Though its average distance from the sun is somewhat more than 50% greater than that of the earth, or 141,690,000 miles, it varies about 13,000,000 miles from this figure. Mars is nearest the sun when in the same direction that the earth is on Aug. 28. Consequently an opposition at that date would bring it to within about 35,000,000 miles, while one around the first of March would find it 63,000,000 miles away, as it was at the last approach before this March, on Feb. 18, 1948.

The planet reaches opposition every two years two months, approximately. The poorest opposition is now past, and future ones will improve. That of May 2, 1952, will be 52,400,000 miles and its successor on June 25, 1955, will shorten the distance to 40,300,000 miles. The closest approach since 1924 will arrive on Sept. 11, 1956, when it will be only 35,400,000 miles away. On that occasion the great 200-inch Hale telescope at Mt. Palomar in California, and other great instruments recently built or now under construction, will surely be aimed at it, to find new knowledge concerning this mysterious planet. Perhaps they will even settle the problem of the Martian "canals," those curious markings which some have thought indicative of the presence on Mars of an intelligent race of beings.

An eclipse of the sun occurs on March 18, but is not visible in North America. Moreover, there is very little settled land





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where it will be possible to observe it. This is an annular eclipse, one in which the distance of the moon is such that even though it passes in front of the sun, it appears smaller than that body, and does not completely cover it. Around the dark disk of the moon, even where the eclipse is seen best, there remains a ring, or annulus, of the solar disk.

Annular Eclipse of Sun

Ordinarily, at such an annular eclipse, there is a path on the earth along which the moon can be seen exactly in line with the center of the sun, but this month that part of the path is off the earth entirely. However, calculations show that over a small area of the South Atlantic Ocean, between South Africa and Antarctica, a somewhat off-center annular eclipse will appear, if anyone is there to see it. A partial eclipse, with the moon only partly covering the sun, will be observable over a greater area, though this, too, is mostly over the South Atlantic, between South Africa and South America. A small partial eclipse will be visible from the southern tip of South America and from South Africa, where it will occur as the sun is setting.

Time Table For March

March	EST	
2	8:14 p. m.	Algol (variabe star in the constellation of Perseus) at minimum
4	5:34 a. m.	Full moon
	10:41 a. m.	Moon passes Saturn
5	5:03 p. m.	Algol at minimum
6	12:36 a. m.	Moon passes Mars
	8:00 a. m.	Moon nearest, distance 225,400 miles
	3:00 p. m.	Venus at greatest brilliance
	12:00 p. m.	Saturn nearest, distance 778,500,000 miles
10	9:38 p. m.	Moon in last quarter
14	12:57 p. m.	Moon passes Venus
15	3:05 p. m.	Moon passes Jupiter
18	10:20 a. m.	New moon; annular eclipse of sun, visible in South Atlantic Ocean
20	11:36 p. m.	Sun crosses equator, vernal equinox, beginning of spring in northern hemisphere and of autumn in southern hemisphere
22	6:00 a. m.	Moon farthest, distance 252,100 miles
	9:59 p. m.	Algol at minimum
25	6:48 p. m.	Algol at minimum
26	3:09 p. m.	Moon in first quarter
27	1:00 a. m.	Mars nearest, distance 60,360,000 miles
31	5:55 p. m.	Moon passes Saturn

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, February 25, 1950

ENGINEERING

Safe Cable for Outdoor Neon Signs Now Available

➤ SAFE high-voltage cable for outdoor neon signs, recently developed with insulation made of polyethylene and chlorine compounds, was recommended to the American Institute of Electrical Engineers by L. F. Roehmann and E. W. Greenfield of the Anaconda Wire and Cable Company, Hastings-on-the-Hudson, N. Y. Decreased maintenance is an important result.

The new cable is safe in operation, is unaffected by moisture, contamination and salt deposits at the ends, requires no special knowledge or skill to handle, and will meet specifications relative to flame-resistance, they said.

The development of this cable will mean a great saving in maintenance cost of neon light signs. Some 10,000,000 feet of various types of cable were required last year in the United States for luminous signs. And despite the fact that cable used for neon signs is high-voltage, installation techniques usually follow accepted practice of low-voltage wiring, they declared.

Conclusions of tests reported by these engineers were: rubber-and-friction tape splices are not permissible in exposed sign cables; because sign cable runs are short, only continuous lengths should be used; and all-plastic insulated cables are adequate even under severe operating conditions provided the ends are properly protected.

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ENGINEERING

Cold Weather Starting Easier with New Heater

➤ EASY cold-weather starting of internal combustion engines, of the types used in automobiles, airplanes and particularly diesels, is promised by an Italian inventor who received an American patent for a device that utilizes an electric heater to raise to a high temperature the air employed in combustion.

The inventor is Gianni Lancia, Turin, Italy. Patent 2,485,750 was awarded to him by the U. S. Patent Office. His heating device is attachable to any make of engine of the internal combustion type.

Within his attachable unit is a block of refractory material with passages through which wire of high electric resistance is placed. When connected to an electric supply source, high heat results. After the heating unit is raised to a high temperature, the engine crankshaft is rotated by self-starter or otherwise and hot air is drawn through the heater into the engine to mix with the fuel to give a mixture that is easily ignited.

Science News Letter, February 25, 1950