

ASTRONOMY
Planets Gain Attention

Mars Now Visible During Entire Night; Rare Partial Transit of Mercury Will Also Occur During May

By JAMES STOKLEY

COMING into view in the evening sky after an absence of many months the planet Mars is now visible during the entire night. At the beginning of May it is seen low in the southeast almost as soon as it gets dark. It is above the star Antares, in Scorpius, the scorpion. Both planet and star are shown on the accompanying maps. These depict the appearance of the heavens at 10:00 p. m. (standard time) on May 1, 9:00 p. m. on the 15th and 8:00 p. m. on the 31st.

On May 24, Mars is directly opposite the sun. Then it rises at sunset and sets at sunrise. At about this time it is also at the closest approach it makes to the earth on this trip around the sun. May 27 is the date when the distance is least. Then it is 47,242,300 miles away. Sometimes it can approach even closer, to as little as 34,600,000 miles, but it can also get as far away as 245,000,000 miles, so just now it is really quite neighborly. Many observatories are taking advantage of this close approach to study it.

No other planets are visible in the early evening sky during May, but Jupiter rises about 12:30 a. m. (standard time), at the beginning of the month and about 10:30 at the end. It is then a brilliant object in the southeast. Saturn and Venus both appear in the east about two hours before sunrise. The latter is by far the brighter, and on May 24 will be at its greatest brilliance, about ten times that of Sirius, the brightest star.

Heavenly Mirrors

These planets are all bodies like the earth, shining by reflected sunlight, but the other objects seen in the night-time sky are stars, far distant suns. Most brilliant of these now to be seen is Vega, in Lyra, the lyre, low in the northeast. Still lower is Cygnus, the swan, which contains the bright star Deneb.

High in the north is the great dipper, part of Ursa Major, the great bear. The dipper is upside down, the bowl

to the left. The pointers, the two stars in the bowl farthest from the handle, indicate the direction of Polaris, the pole star.

By following the curve of the dipper's handle to the south, it is easy to find another bright star, Arcturus, in Bootes, the bear driver. Along this same curve, still farther south, is Spica, marking Virgo, the virgin. To the right of Spica is Corvus, the crow, consisting of four stars in a conspicuous quadrilateral.

By following the pointers to the south one soon comes to Leo, the lion, high in the west. This contains a smaller group called the sickle, which has the star Regulus at the end of the handle, to the south. Low in the west and north-west are a few stars that remain of the glorious groups that ornamented the evening skies of winter.

Procyon

Almost directly west is Procyon, in Canis Minor, the lesser dog. Farther north is the group of Gemini, the twins, with first magnitude Pollux, and the fainter Castor. Still farther north is Auriga, the charioteer, with Capella.

It is unfortunate that the chief event on the May celestial program, a phenomenon which occurs approximately once in a thousand years, is not visible

from North America. This is a partial transit of Mercury. The planets revolve around the sun in orbits approximately circular, but not in quite the same plane. Nearest the sun is Mercury, which moves in a path inclined 7 degrees to that of the earth. Then comes Venus, with a path inclined 3.4 degrees to ours. Next beyond is the earth.

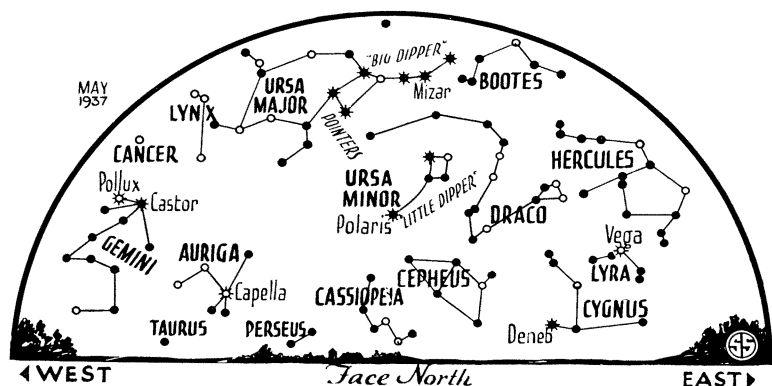
Every 584 days Venus comes almost between the earth and the sun, but generally it is either above or below the line joining the two latter bodies. At rare intervals, however, it happens to be in this position at the time that it is also in the plane of the earth's orbit. Then it comes squarely between the earth and sun, and can be seen as a black spot on the solar surface. This is called a transit of Venus. The last transit occurred in 1882, the next will not come until 2004.

Every Thousand Years

Transits of Mercury are more common, and happen every seven years on the average. There was one on November 8, 1927; there will be another in 1940 on November 12. Then the planet will be completely in front of the sun. A person looking through a telescope equipped with the proper eyepiece, for protection from the solar brilliance, will see the huge disc of the sun, with a tiny speck upon it. On such an occasion, the sun's apparent diameter is about 160 times that of Mercury.

Mercury is very much smaller than

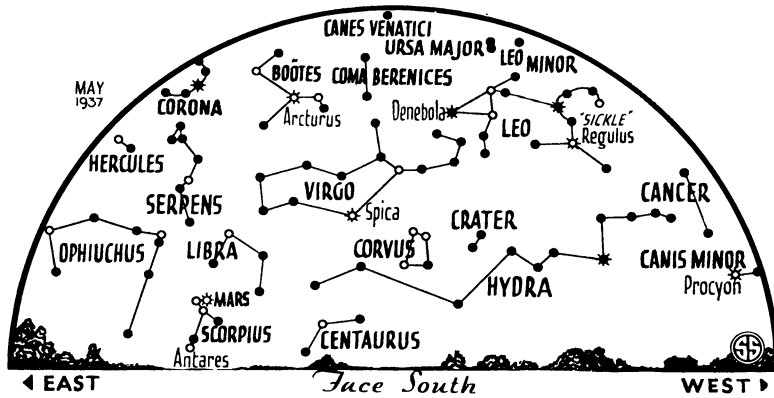
☼ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



RUDDY MARS

You can now follow it all through the night.





OLD FRIENDS
Here are the familiar constellations of the north

the sun, mere speck, in fact. If it comes in front of the sun at all, it is generally completely in front of it. If it does not cross the disc, it misses it completely. But, at rare intervals, about once in a thousand years, it just skims along the sun's edge, partly on it, partly off. That is what will happen May 11. It will take about 40 minutes from the time the edge of the planet first touches the edge of the sun until it leaves.

From a point in the Indian Ocean, about 2000 miles south of Australia, Mercury would be seen to enter for more than half its diameter on the solar disc. It is not very likely that anyone will see it from this inaccessible location. But from most of southern Asia, the Philippine Islands, Western Australia, the Indian Ocean, and central and southern Africa, the planet will be seen to enter the sun's disc to a lesser extent. Many observatories are located in these regions, and to astronomers watching, the sun's disc will be seen to have a small nick in the edge.

Is There Atmosphere?

The chief value to astronomy of this partial transit will be in the possibility that it affords of checking the existence of an atmosphere on Mercury. Theoretically, it has none. For every planet there is a velocity of escape, a speed at which a thing, whether as small as an atom or as large as a house, can be thrown so that it overcomes the planet's gravitational attraction and leaves it for good. For the earth this is about 7 miles per second. Because Mercury is so much smaller, the critical speed there is only 2.2 miles per second.

The molecules of a gas, like the atmosphere of the earth, are in constant motion, but they seldom achieve the speed of 7 miles per second. Therefore,

the molecules do not leave the earth, as they would if they were moving more rapidly. On Mercury, not only is the velocity of escape lower, but the planet is nearer the sun, the temperature is higher, which would give the atmosphere molecules higher velocities than they would have on earth. Consequently, most of them move faster than 2.2 miles per second. Therefore, if Mercury were suddenly to be endowed with an atmosphere like that of the earth, it could not hold it very long for the molecules would soon shoot off into space.

Opportunity for Tests

There seems to be no flaw in this reasoning, but certain observers of Mercury have noticed peculiar effects which they interpret as showing the presence of an atmosphere after all. If there were an atmosphere, it would bend light rays around it, like a prism, and, with the sun behind it, the dark disc of the planet should be surrounded by a brilliant halo. Venus has some sort of an atmosphere, and, at the time that it enters or leaves the sun's disc, at a transit, shows such a halo.

At ordinary transits of Mercury, the planet is so small, and moving so quickly, that there is little time to make these observations as it enters or emerges from the disc of the sun. When it is on the disc, the sun's own brilliance would make it impossible to see a halo. But this time there will be many minutes while the planet is partially on the disc. During this time, there should be plenty of opportunity to see whether there is any effect of an atmosphere. If there is, observers should notice a half ring of light, extending out from the sun's edge. If this is not seen, it will be good evidence that the theoretical considerations are correct.

On May 10, at 1:00 p. m., E. S. T.,

the moon will be at perigee, or nearest the earth, with a distance of 222,040 miles. It will be at apogee, on the 24th at 8:00 a. m., 252,430 miles away.

On May 24, during the daytime for us, the moon will pass very close to Mars. On the evening of that date, as well as the previous night, the two objects will be very close together. In some parts of the southern hemisphere, Mars will actually pass behind the disc of the moon, it will be occulted.

Phases of the Moon

	E. S. T.
Last Quarter.....	May 3 1:36 p. m.
New	10 8:18 a. m.
First Quarter	17 1:49 a. m.
Full	25 2:38 a. m.

Science News Letter, April 24, 1937

PSYCHOLOGY

Literacy

● "By the time he has reached school age it has been estimated that the normal child has an understanding vocabulary of several thousand words. This forms the foundation on which he must begin, at the age of six or thereabouts, to erect an entirely new form of language—reading and writing—if he is to take his place in the literate world. In the occasional very precocious child, reading and writing can be taught much before the age of six, but taking our school population at large, attempts at teaching graphic language before this age are unprofitable and it seems probable that it is this fact which has determined the age of six for an introduction for formal academic training."—Samuel Torrey Orton in *READING WRITING AND SPEECH PROBLEMS IN CHILDREN* (Norton & Co.).

Science News Letter, April 24, 1937

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