

ASTRONOMY

Orion the Key

Conspicuous Stars in the Belt, Three in a Row, Help In Locating Other Stars; Spring Comes on March 20

By JAMES STOKLEY

ON a clear evening in March, Orion, the heavenly warrior, appears in the southwest, easily identified by the three stars of similar brightness in a row, which form his belt. This constellation provides an easy starting point for the study of the March heavens. Above is Betelgeuse, below is Rigel. Using the belt stars as pointers, and following their direction to the right, one comes to a V-shaped group of rather faint stars, with a bright one, distinctly red in color, on the left arm of the V.

These are the Hyades, marking the face of Taurus, the bull. The bright star, Aldebaran, marks the animal's eye. Still farther to the right is a smaller cluster, the Pleiades, known in mythology as the "seven sisters."

If we follow the direction of the belt to the left, it brings us just above the brightest star in the sky, Sirius, the dog-star, part of Canis Major, the great dog. This should not be confused with Venus, which is much brighter.

Venus, however, is a planet, a body like the earth, revolving around the sun and forming part of the solar system. It has no light of its own, but is visible by the sunlight it reflects. Sirius, like all the stars, is another sun, a glowing globe of gas, half a million times as distant as ours.

Venus this month is almost directly west, below the Pleiades, while Sirius is farther to the south. Both of these objects are pictured on the accompanying maps. These depict the skies as seen about 10:00 p. m. March 1, 9:00 p.m. March 15, and 8:00 p.m. March 31.

The Twins

Above Orion are the Gemini, the twins Castor and Pollux. Canis Minor, the lesser dog, is above his larger brother, and contains the star Procyon. High in the northwest is Capella, part of Auriga, the charioteer. Farther north is Cassiopeia, the queen. This group has the shape of the Greek capital letter Sigma, or a W turned on its side, the top to the right. The great dipper, part

of Ursa Major, the great bear, is high in the northeast. The "pointers" at the upper part of the bowl of the dipper, indicate the direction of Polaris, the pole star.

By following the curve of the handle of the dipper to the south, Arcturus can be located, in Bootes, the bear driver. Still farther south is Spica, marking Virgo, the virgin. Another prominent constellation is seen above Virgo, which is Leo, the lion. Just as the great bear contains a smaller group, the dipper, so does the lion contain the "sickle." The blade, which also forms the lion's head, curves to the right, and Regulus, below, marks the end of the handle.

Spring!

An important astronomical event occurs on Saturday, March 20, at 7:45 p. m., eastern standard time. The sun, which has been moving northward in the sky all winter, reaches the half-way point, and crosses the equator. This is the beginning of spring.

Venus is the only planet visible on March evenings. Mercury and Saturn are both too nearly in the sun's direction to be seen at all this month. Mars appears in the east about midnight, while Jupiter comes up about three hours be-

fore sunrise. But the great brilliance of Venus well atones for the lack of other planets. It can get brighter than any other planet or star, and this month it is brightest, on the twelfth. Then it will be of magnitude minus 4.3. Sirius, the brightest star, is minus 1.6; thus Venus exceeds it about 40 times. The difference in brightness between a star of one magnitude and the next is about two and a half times.

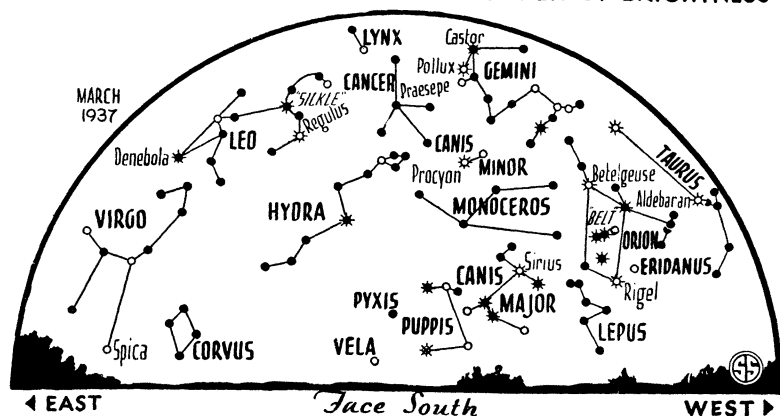
A Crescent

Through a telescope during March Venus looks like the crescent moon. This happens because, being a planet, it is illuminated by the sun, so that the sunward hemisphere is bright, the other dark. The same, of course, is true of earth. Venus moves in an orbit only 67,170,000 miles from the sun, while that of the earth is 92,900,000 miles.

At present Venus is coming between earth and sun, so that most of its lighted half is turned away from us, and only the edge left in view. During the coming weeks, as it swings into line with the sun on April 17, the crescent will become more narrow, until it disappears entirely.

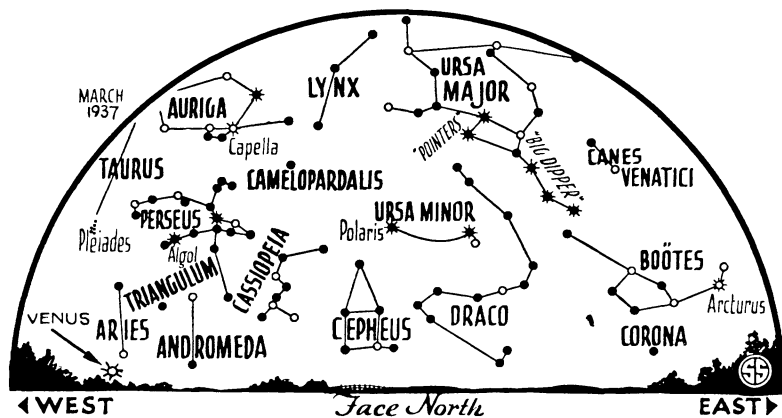
The moon changes phase in just the same way but it differs in one important particular. Its distance does not vary greatly from the average of 240,000 miles. Hence, it appears the same size whether full or in a crescent phase. But

☼ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



THE AID

Use Orion's familiar belt as the starting point in your search for the stars.



BRIGHT CRESCENT

Venus is in the "new-moon" phase, but at its brightest for all that.

when Venus is full, when the bright half is toward us, it is beyond the sun, at a distance of 160,000,000 miles, equal to the sum of the distance of Venus, and the distance of the earth, from the sun. Now Venus is in nearly the same direction from sun as earth and is less than 30,000,000 miles from us.

Again, the moon is brightest when it is full, but Venus, as this month, is brightest as a crescent. Always the same size, the moon gives us more light, the more of the bright half is towards us. This would be true of Venus also if its distance did not change, but, as it does, there are two factors to be considered. Its proximity makes it look brighter, and this more than compensates for the phase.

Support for Theory

In the history of astronomy, the phases of Venus have great interest, because their discovery afforded one of the most convincing arguments in favor of the theory of Copernicus that the earth, and the other planets, revolve around the sun. Before 1543, when he published his ideas, the Ptolemaic theory had held sway. This taught that the sun and planets revolved about the earth as center.

Venus, the followers of Ptolemy supposed, moved in an orbit smaller than that of the sun. Furthermore, since it was never observed more than about 45 degrees away from the sun, they thought that it swung first to one side, then to the other, of the line connecting the sun with the earth. It could never possibly get beyond the sun, and so its phase should always be a crescent, wide or narrow.

So radical did the authorities of the day consider the Copernican theory that

they gave it violent opposition. But in 1610 Galileo, in Italy, with his newly invented telescope, found that Venus showed a complete change in phase, from crescent to full. Not quite sure, perhaps, but wishing to establish his claim, he first announced his discovery as an anagram, "Haec immatura a me iam frustra leguntur: o. y." Apparently this means: "These things not ripe are read, as yet in vain, by me." But if the letters of the Latin sentence are rearranged they read "Cynthiae figuras aemulatur Mater Amorum." That is: "The Mother of Love imitates the phases of Cynthia." The "Mother of Love," of course, was Venus, while Cynthia was the moon. He announced the solution several months after the original anagram. Probably in the meantime he had made further observations to confirm his remarkable discovery. The only way that it could be explained was by assuming that Venus was sometimes nearer than the sun, sometimes farther away—that is, it revolved about it.

Neptune

There is another planet in the evening sky in March, in the direction of Leo, but it is visible only through a telescope. This is Neptune, which was, before the discovery of Pluto in 1930, the most distant known planet. On March 8, at 9:00 a. m. E.S.T., it is directly opposite the sun, and at its closest this year, but even then it is 2,713,730,000 miles away.

The phases of the moon are given in the accompanying table. Twice will it be at the greatest distance of its path around the earth, at the point called apogee. On the third, at 3:00 a. m., it will be 251,370 miles from us. Then it draws closer, and on the 14th, at

10:00 p. m., will be at perigee, its distance 225,970 miles. Then it recedes, to a second apogee on the 30th, at 8:00 p. m., with 251,910 miles separating it from earth, and starts approaching again.

On March 15, at 8:38 a. m., E.S.T., the moon passes Venus, about four and a half moon diameters to the south. Thus, on the evening of the 14th, the moon will be seen to the west of Venus, and by the next evening it will have moved to the east.

Phases of the Moon

E.S.T.

Last Quarter.....	March 5, 4:17 a.m.
New	March 12, 2:32 p.m.
First Quarter.....	March 19, 6:46 a.m.
Full	March 26, 6:12 p.m.

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ASTRONOMY

Whipple Comet is Now Increasing in Brightness

A COMET discovered by Dr. F. L. Whipple of Harvard Observatory, which astronomers are now watching in the northeastern sky through telescopes, has increased in brightness some six and one-quarter times and moved a distance about six times the apparent diameter of the sun at noon, according to latest observations. (Feb. 15.)

When first noted on photographs on Feb. 4 and again on Feb. 7, the Whipple comet was of the twelfth magnitude. It increased in brightness until of the tenth magnitude. It will not be visible to the naked eye until it reaches the sixth magnitude, which will require a further increase in brightness of some 39 times over what it is now.

Astronomers have not yet computed an orbit that will tell whether the comet will attain naked eye visibility. Latest position of the comet is at right ascension 13 hours, 30 minutes and 5 seconds; declination plus 38 degrees, 39 minutes and 13 seconds. This position is near the minor constellation Canis Venatici, the hunting dogs. The tail of the comet is "less than one degree long." For comparison, the apparent size of the full moon's diameter is a little over one-half degree.

Science News Letter, February 27, 1937

Chimpanzees can catch cold, like human beings, but apes cost so much they have not been used in extensive experiments to learn more about the common cold.