

ASTRONOMY

# Venus Leaves the Evening Sky

**Hanging Like a Gay Lantern in the West All Spring, This Brightest of Planets Will Soon Be Gone from View**

By JAMES STOKLEY

**T**HE PLANET Venus, which has been so brilliant all spring that it was often mistaken for some artificial light hung in the western evening sky, is still with us, but it will soon be gone from view. During the first half of the month it will shine toward the direction of the constellation of Gemini, the twins. Of magnitude minus four, at the first of the month, it far surpasses any other star or planet, and there is little difficulty in finding it. There is another planet, Mars, in the same direction, but it is less than a hundredth as bright as Venus. This is quite different from a year ago. Then Mars was unusually close, and was the brightest planet. During the night of June 6, however, Venus passes just to the north of Mars, and then it may more easily be found.

These planets are indicated on the accompanying maps. The charts show the way the skies appear at about 10 p. m. standard time, on June 1, and an hour earlier on June 15.

Of the stars of the June evening sky, brightest is Vega, in the constellation of the lyre, Lyra, high in the northeast. Just below is Cygnus, the swan, in which is found Deneb. The name of this star comes from the Arabic, meaning "tail," a name given because it marks that part of the bird. Cygnus is also known as the northern cross. It now lies on its side.

## Aquila, the Eagle

To the right of Cygnus, a little lower, is another bird, Aquila, the eagle, with another first magnitude star, called Altair. The three stars, Vega, Deneb and Altair, make a large right triangle, Vega at the right angle, forming a group that can be easily found.

Directly overhead we see the star-picture of Bootes, the bear driver, with flaming Arcturus. The greater part of the constellation is to the north of Arcturus. Five of its stars form a somewhat distorted pentagon, that suggests the shape of a kite. Arcturus is in the kite's tail.

Below Arcturus is Virgo, the virgin, one of the constellations of the zodiac, the path through which the sun, moon and planets are seen to move. Spica is

the brightest star. To the right of Virgo is another zodiacal group, Leo, the lion. This consists of two principal parts. Nearest Virgo is a little triangle, the lion's haunches, and farther to the right is a hook-shaped arrangement, called the sickle. Regulus, the most brilliant star in Leo, is at the end of the handle of the sickle.

Left of Virgo is Libra, the scales, also in the sun's path, but this, mainly forming another pentagon, contains no very brilliant stars. To the left of that is Scorpius, the scorpion, with brilliant antares. Directly south, below Libra, is the rather inconspicuous wolf, Lupus, and Centaurus, the centaur. The latter contains alpha Centauri, the nearest star, except the sun. This star, along with other brilliant parts of the figure, never rises in most of the United States. From southern Texas and Florida, however, it can be seen this month, just above the horizon.

## Circumpolar Stars

Looking to the north, you can see that group of constellations called circumpolar, because they revolve around the pole of the sky. These never set, but are always visible, though sometimes in a different aspect. They swing like a wheel around the pole as a hub. One of these is the great dipper, in Ursa Major, the great bear. The two stars Dubhe and Merak, at the end of the bowl, are the pointers. They indicate Polaris, the pole star, which is very close to the pole of

the heavens, and stands at the end of the handle of the little dipper. The constellation, Cassiopeia, the queen, shaped like a letter W, is low in the north, not in a very good position. The same is true of Auriga, the charioteer, and Gemini, the twins, near the northwestern horizon. The star Capella is in Auriga, and Castor and Pollux in the Gemini.

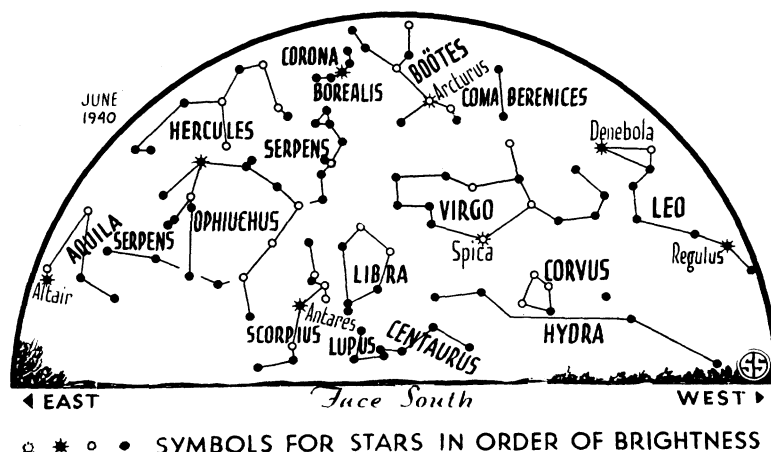
## Venus an Illustration

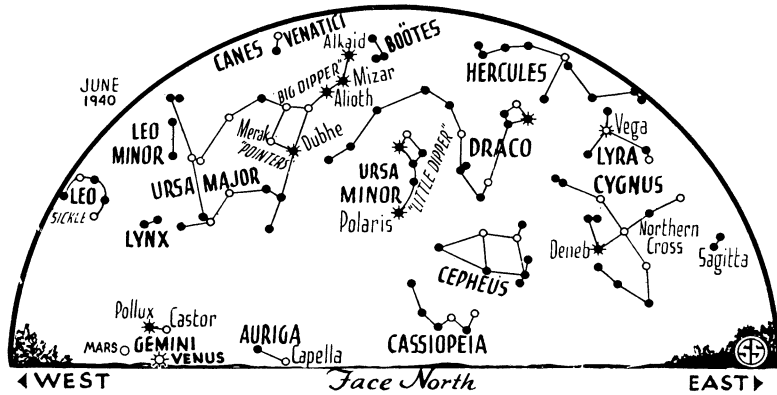
The behavior of Venus this month gives an interesting illustration of the way the planets move around the sun. Last autumn it was beginning to appear in the west just after sunset. Though bright, it did not then shine with the extreme brilliance it has now.

Month after month it brightened, and drew farther from the sun, setting, therefore, later and later in the evening. At the end of April, it stopped drawing from the sun, and started approaching it again, which means that it set earlier each night. Despite this, however, it continued brightening, until May 20.

Now it is undergoing a decrease in brightness. On June 26 it will be in the same direction as the sun, so it will then be entirely invisible. One might arrange a sort of a contest this month, to see how close to the 26th it can still be observed. Early next month, one who watches the eastern sky before sunrise will be able to see it again, shining brightly in that position.

Ages ago, men found this behavior very hard to explain, and at one time they supposed that there were two planets involved, instead of one. They called it Phosphorus when it appeared in the morning, and Hesperus when they saw





it in the evening. Then, even when they realized it was one, they still thought it revolved around the earth, like the sun and the other planets. The complicated Ptolemaic system was erected to explain these movements, and even then it did not do so with entire satisfaction.

Now we know, of course, that Venus, the earth, and all the other planets, revolve around the sun. Venus' path is the one next inside ours. It goes around more rapidly, in 225 instead of 365 days. Nearly a year ago, Venus was in line with the sun, and hence invisible. But unlike its position now it was then on the far side of the sun. The earth and Venus move in the same direction, so Venus gradually caught up to the earth, and on June 26 it will pass us. Being so much closer, it goes by very rapidly, like an automobile a few feet away, compared with one a block away. Even though each one may be going directly across our line of sight and traveling at the same speed, the nearer one seems to move much more rapidly.

Through a telescope this month Venus appears as a narrow crescent, like the very new moon. A year ago it looked more like a full moon. This change, incidentally, provided a very good proof that something was wrong with the Ptolemaic theory. Under that system, Venus was moved around the earth in a path nearer to us than the sun. Hence, it could show a crescent phase, but could not possibly ever appear full. So, when Galileo found in 1610 that it duplicated the complete cycle of the moon's change of phase, he proved that Venus was sometimes nearer, and sometimes farther than the sun. He inserted firmly a very large nail into the coffin of the old Ptolemaic idea.

**Celestial Time Table for June**

Sunday, June 2, 1:12 p. m., Moon passes Jupiter. Monday, June 3, 12:12 a.m., Moon passes Saturn. Wednesday, June 5, 8:05 p.m., New moon. Friday, June 7, 1:00 a.m.,

Venus passes Mars; 7:58 a.m., Moon passes Mercury; 11:37 p.m., Moon passes Venus. Saturday, June 8, 1:00 a.m., Moon passes Mars. Tuesday, June 11, 9:00 p.m., Mercury passes Venus. Wednesday, June 12, 8:59 p.m., Moon in first quarter. Friday, June 14, 10:00 a.m., Moon nearest—229,400 miles away. Sunday, June 16, 8:00 p.m., Mercury passes Mars. Wednesday, June 19, 6:02 p.m., Full moon. Friday, June 21, 8:37 a.m., Summer commences—sun farthest north. Monday, June 24, 9:00 a.m., Mercury farthest east of sun—visible as evening star for few days around this date. Wednesday, June 26, 4:00 p.m., Venus passes earth—between earth and sun. Thursday, June 27, 6:00 a.m., Moon farthest—251,100 miles away; 1:13 p.m., Moon in last quarter. Sunday, June 30, 7:46 a.m., Moon passes Jupiter; 1:47 p.m., Moon passes Saturn.

Eastern Standard Time throughout.

Science News Letter, June 1, 1940

**ENGINEERING**

**New Type of Vacuum Tube Has Unusually Long Life**

A NEW TYPE of vacuum tube for amplifying and repeating weak electrical messages that carry long-distance telephone communication has been developed by scientists of the Bell Telephone Laboratories. It is confidently expected to give many years of continuous 24-hour-a-day service.

The present telephone tube, which the new advance replaces, has a theoretical average lifetime of 18,000 hours. The new tube will exceed this several times, scientists report.

Best comparison of the new and the old is that after 22,000 hours of service (two and a half years) only 55% of the old style tubes were in service. With the new tubes 95% were in service after the same interval of time. From comparison of the "death" curves of the two vacuum tubes telephone engineers estimate, conservatively, an average lifetime several times longer for the new tubes than for the old.

For the layman, whose nearest contact

with vacuum tubes is probably in his radio set, this new advance will probably be a worry for he knows that his radio tubes are guaranteed only for a life of 1,000 hours of operation. The worry will be the same type of difficulty which arose last year when Dr. F. B. Jewett, vice-president of the American Telephone and Telegraph Company, was vigorously questioned at the Monopoly Committee hearings in Washington about other telephone repeater tubes having a life of 50,000 hours.

It was disclosed then that the principles which give long life to telephone tubes can be applied to the tubes used in radio sets, but that high cost would probably rule them out. Moreover, excessive long life of such tubes, which is the key demand on telephone circuits, would permit them to outlast the rest of a common radio set many times. It would be like putting jewel bearings in a dollar alarm clock.

The extra long life of telephone repeater tubes comes about because of the extreme care in their production, plus a most rigid test, prior to use, which eliminates many tubes which might quickly show failure in service.

Science News Letter, June 1, 1940

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