

## ASTRONOMY

# Venus Brightens

Mars will fade in February skies as it travels farther from the earth. Meanwhile, the planet Venus can be seen in the southwest until about two hours after sunset.

By JAMES STOKLEY

► MARS is drawing farther away and rapidly fading. Now Venus is increasingly prominent. It can be seen low in the southwest on February evenings until about two hours after sunset.

It is in the direction of the constellation of Aquarius, the water carrier. This, however, is a rather inconspicuous group of stars that will be much harder to see than Venus itself. During February, Venus shines with a brilliance about 20 times that of a typical first magnitude star, such as Pollux, seen high in the south in Gemini, the twins. Thus, there is no difficulty in locating Venus, if the southwestern sky is clear.

Venus is not shown on the accompanying maps, as these depict the sky at a later hour: 10:00 p.m., your own standard time, at the first of February, 9:00 p.m., at the middle of the month and 8:00 p.m. at the end. Mars appears on them, however, as it is in Taurus, the bull, high in the southwest. It stands just to the left of the little cluster of fainter stars called the Pleiades. These are sometimes called the "seven sisters," although it takes a keen eye to see more than six without some sort of optical aid, such as a telescope, or binoculars.

Mars, at the middle of February, will be about 75% brighter than Pollux, but this is less than one-tenth of what it was last November, when it made an unusually close approach to the earth.

## Sirius is Brighter

Even brighter, however, is the star called Sirius. This is the "dog-star," in Canis Major, the great dog, in the south. Directly above this group is the faint constellation of Monoceros, the unicorn. Canis Minor, the lesser dog, is just above that; in it is another first-magnitude star, Procyon. Going upwards another step, is Gemini, in which Pollux stands. Castor, the other twin, is represented by the fainter star (which is second magnitude) a little above and to the right.

Taurus, which is the present location of Mars, is shown high in the southwest. It also contains a star of the first magnitude, Aldebaran, the eye of the bull. Above this is Auriga, the charioteer. Capella is the name of its bright star. On the maps, Auriga is divided; part of it appears on the southern map and the rest, with Capella, on the northern.

Orion, the warrior, the most brilliant of all the constellations, is between Taurus and Canis Major. It is the only star group to contain two first magnitude stars. One is Betelgeuse, above, and Rigel, below. Between these is a row of three stars, each a

little fainter, which form Orion's belt. This feature makes it rather easy to identify.

Leo, the lion, is high in the east. In it is another bright star, Regulus. Left of Leo, is the well-known great dipper, which is part of Ursa Major, the great bear. Ursa Minor, the lesser bear, is still farther to the left, directly north. One member of this group is Polaris, the pole star, which is overhead at the north pole of the earth.

Although Venus and Mars are the only planets presently visible to the naked eye in the evening, two others appear after midnight. The first, rising in the east about 2:00 a.m., is Jupiter, in Scorpius, the scorpion. While only about one-fifth as bright as Venus, it is many times brighter than any other planet, or any star. A few hours later it is followed by Saturn, which is in Sagittarius, the archer. This planet is now about the same brightness as Mars. Mercury will not be visible at all during February, for it is too nearly in the same direction as the sun. In fact, it passes behind the sun on St. Valentine's day. The astronomer calls this "superior conjunction."

With rockets being fired at earth's one natural satellite—the moon—that body has been attracting a lot of attention in recent months. In the past, the moon has been

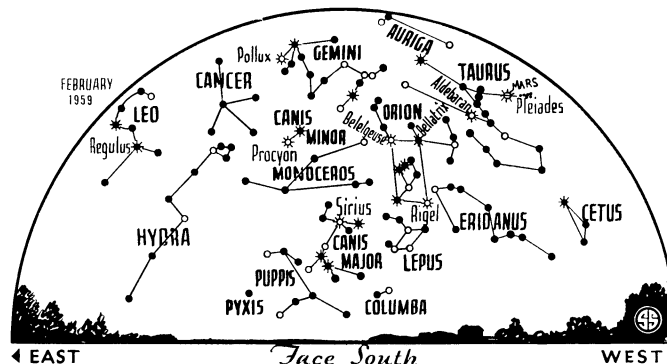
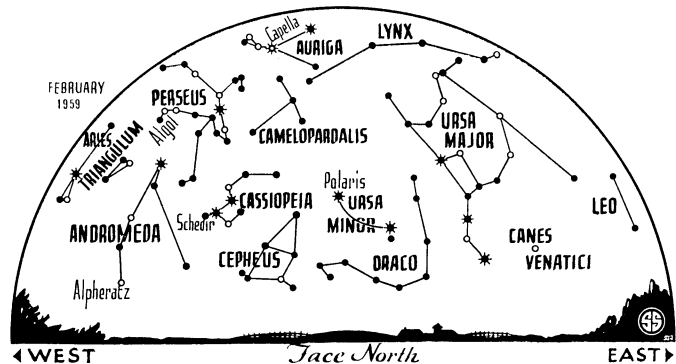
largely neglected by professional astronomers, who have been more interested in studying the far more distant stars and galaxies. But now, as the time when men may actually be placed there draws closer, some large telescopes have been turned on it, and new data are being collected.

One of the most striking recent developments has been the discovery, by a Russian astronomer, Dr. N. A. Kozyrev of the Crimean Astrophysical Observatory, of what appears to be an active volcano on the moon.

## Moon Volcano

He used a reflecting telescope, like those at Mt. Wilson and Mt. Palomar in California. Unlike the more familiar reflector, where a lens focuses the light rays from the distant object on a photographic film, or into an eyepiece through which the observer looks, this uses a dish-shaped mirror to perform the same function. This mirror, at the Russian observatory, is 50 inches in diameter, although only a quarter of the diameter of the "big eye" at Palomar, the largest in the world.

As described recently in a British weekly, *The New Scientist*, by Dr. Zdenek Kopal of the University of Manchester, it was in the early morning hours of Nov. 4, 1958, with the moon two days before the phase of last quarter, that Dr. Kozyrev was studying the region of the lunar crater called Alphonsus. There is a prominent



★ \* ○ ● SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

peak 80 miles wide in the center of this circular mountain. He was watching this intently to keep the telescope accurately pointed for 30 minutes, from 2:30 to 3:00, while he made a spectroscopic exposure. The light from the region being examined passes through a narrow slit, then through a combination of lenses and prisms. The result is a spectrum, which shows the distribution of light of various wavelengths. Ordinarily, the light from the moon shows a spectrum similar to that of the light from the sun, and crossed by similar dark lines. The light of the moon is reflected sunlight.

But, as Dr. Kozyrev watched the central peak of Alphonsus, he noticed that it became unaccountably blurred by some sort of reddish cloud. The spectrogram, when he developed the plate, was very different from what he expected. Instead of the series of well-defined lines, each due to some element in the sun's atmosphere that normally appear, there was a series of bands, called Swan bands, that showed the presence of carbon atoms, paired to form molecules. These do not appear in the sun. Another spectrogram, made between 3:00 and 3:30 a.m., showed only the customary lines.

It seems, according to Dr. Kopal, that these carbon molecules, that appeared so briefly over the central peak, were produced in some way by the breakdown of more complicated molecules. This requires considerably more heat than that of the sun's rays. There must have been some source of heat nearby, perhaps under the lunar surface, just before the appearance of the cloud Dr. Kozyrev observed.

This, of course, was very similar to a volcanic eruption on the earth, so it is the first good evidence that there is some such activity on the moon. Perhaps it is not the completely dead world that many have assumed it to be.

Scientists are eagerly awaiting the time when, with more and better rockets, they can make closeup observations. Then they may find the answers to some of their questions.

### Celestial Time Table for February

Feb.	EST	
1	2:56 a.m.	Algol (variable star in Perseus) at minimum brightness.
	7:32 p.m.	Moon passes Jupiter.
3	11:45 p.m.	Algol at minimum.
4	7:13 a.m.	Moon passes Saturn.
6	8:35 p.m.	Algol at minimum.
7	2:22 p.m.	New moon.
9	5:24 p.m.	Algol at minimum.
13	midnight	Mercury on opposite side of sun from earth.
14	9:00 a.m.	Moon farthest, distance 251,300 miles.
15	2:20 p.m.	Moon in first quarter.
16	12:19 p.m.	Moon passes Mars.
23	3:54 a.m.	Full moon.
24	1:31 a.m.	Algol at minimum.
26	5:00 a.m.	Moon nearest, distance 227,400 miles.
	10:20 p.m.	Algol at minimum.

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

Science News Letter, January 24, 1959

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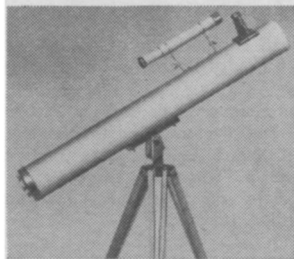
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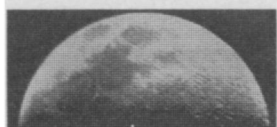


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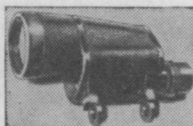
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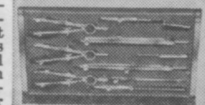
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