

ASTRONOMY

# June Evening Skies

## All Five Naked-Eye Planets Will be Treat For Close Observers on Last Day of Month

By JAMES STOKLEY

**D**URING the month of June the planets and their motions are again the center of interest in the evening sky. This has been the case for several months lately, but now three that have been invisible in the evening are scheduled to make their bow before the month comes to a close. In fact on June 30 all of the five naked-eye planets—Mercury, Venus, Mars, Jupiter and Saturn—will be visible to the keen-eyed observer at some time during the evening.

On the first of June, Mars and Jupiter will be the main characters in this drama, as they have been for some time. During May they were drawing together in sort of a planetary race. All this time the two bodies have been conspicuous in the south, Jupiter, the brighter of the pair, being to the east. At the end of May they were only a degree apart.

This is their aspect as June opens. On the first day of June the moon, then at first quarter, will pass the two planets about two and a half degrees (about five times its own diameter) to the south, making a most interesting spectacle. On Sunday, June 4, the more rapidly moving Mars passes its larger and more brilliant brother, at a distance of only a quarter of a degree (or half a moon diameter) to the south.

The time of closest approach of the two bodies, however, occurs at about 5 p. m., before the sun has set and the planets become visible. When darkness has fallen, they will already have passed, but will still be within less than half a degree of each other. They will also be unusually close the previous night. During the rest of the month they will continue to draw apart and, at the same time, will grow fainter, for both are receding from the earth. But even at the end of June, Mars will be of the first magnitude, and Jupiter considerably brighter, of the minus 1.5 magnitude in the astronomer's brightness scale.

Saturn, next most distant planet after Jupiter, can now be seen in the early morning sky, in the constellation of

Capricornus. It rises about midnight, but at the end of June it will appear about two hours earlier. It will then be a little brighter than Mars but not nearly as brilliant as Jupiter. However, its steady glow low in the eastern sky should make it easy to distinguish.

The innermost of the planets, and the most seldom seen, is Mercury, which never gets very far from the sun and at best can only be seen low in the west just after sunset, or in the east just before sunrise. On the second of July it will be at the greatest distance east of the sun that it will get on this revolution in its orbit and may then be perceived with a little difficulty in the gathering twilight. Possibly it might also be picked up a day or two earlier, and thus make another addition to the list of naked eye planets seen in the June sky.

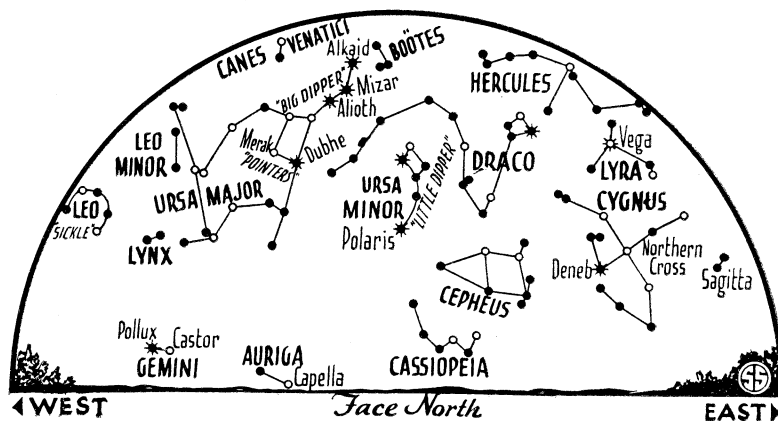
### Venus Near Sun

Last of the five planets mentioned, and next to Mercury in order from the sun, is Venus. Because its orbit is like Mercury's, inside that of the earth, it never gets into a part of the sky at a great distance from the sun. A planet like Mars, Jupiter or Saturn, on the other hand, may be, and often is, seen in a position directly opposite the sun, because they revolve in orbits outside that of the earth. But Venus can get considerably farther from the sun than

Mercury and is sometimes conspicuous in the evening sky for several hours after sunset. This will be the case in a few months. In the middle of June, Venus will set about an hour later than the sun, before it is entirely dark, but it will be so brilliant—about minus 3.3, or six times the brilliance of Jupiter—that it should be possible to pick it up if you have a clear view of the west. Towards the end of the month it will have drawn farther away from the sun and then will be even more easily seen.

It has already been mentioned that the moon passes Mars and Jupiter, which will then be close together, on the first. On that same day the moon will be at first quarter. On the eighth it will be full. It will be at last quarter, rising at midnight, on the 14th, new on the 22d, and at first quarter again, when it will set at midnight, on the 30th. Thus the evenings will be moonlit from the beginning of the month to about the tenth, and again for the last four or five days of June. On the 24th the moon, then a two-day-old crescent, will pass Venus, about four times its own diameter to the north. It will pass Jupiter, about six diameters to the south, in the early morning hours of the 29th. On the evening of the same day it will pass about the same distance from Mars.

The stellar attractions of the June sky are also of interest. Nine first magnitude stars are shown on the maps, which represent the skies as they appear about 10 p. m. on the first, 9 p. m. on the 15th or 8 p. m. on the 30th. The most



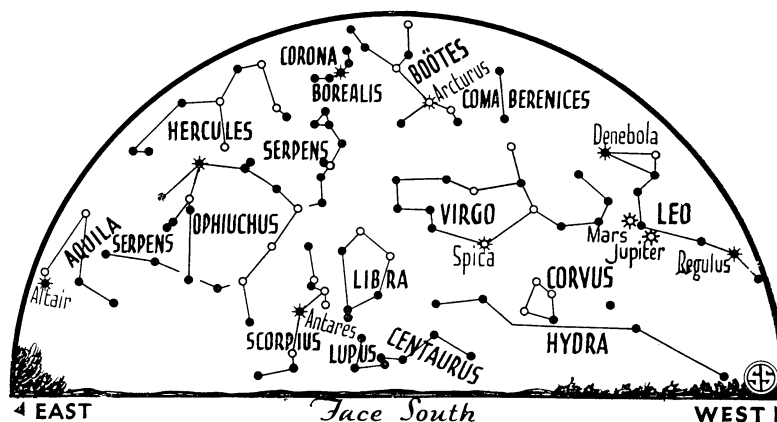
*Vega, most brilliant star of the June evening skies, appears high in the east in Lyra.*

brilliant is Vega, which marks Lyra, and appears high in the east. Below and to the left of Vega is Cygnus, the swan or the northern cross, as it is sometimes called from the arrangement of its stars. The cross is now lying on its side, the long piece pointing southwards. The northernmost star is Deneb, which is another in our list of first magnitude stars. A little lower in the sky, and just to the south of the east point of the horizon, is Aquila, the eagle, with the brilliant star, Altair. Now look towards the south. There, about as high as Cygnus, is visible a star of distinctly ruddy color. This is Antares, marking the constellation Scorpius. The rest of the constellation is a curved row of stars which extend from Antares below and to the left and marks the tail of the scorpion, and a T-shaped group which extends in the opposite direction and represents the scorpion's head.

Scorpius is one of the zodiacal constellations, of which there are twelve, marking the ecliptic, or the path of the sun, moon and all the planets. Immediately to the west of the scorpion's head is a pentagonal group of faint stars, which constitutes Libra, the scales, next along this path. Then we come to Virgo, which has the brilliant Spica shining in the southwest to mark it. And then we come to Leo, the lion, already mentioned because of the presence in it of Mars and Jupiter. The brightest star in this constellation, but considerably fainter than either of the two planets, is Regulus, which is almost directly west. Extending northwards and upwards from Regulus is a row of stars that forms a hook. This is called the "sickle," and the point of the curved blade now points downwards.

Above Virgo is another conspicuous constellation, Boötes, the herdsman, in which appears the third brightest star of the June evening skies. This is Arcturus. Its prominent position, almost directly overhead, makes it easy to locate. It is somewhat brighter than Mars though not as brilliant as Jupiter. Its distance from us is so great that its light, which travels at the rate of 186,000 miles a second, sufficient to take it across the continent in a sixtieth of a second, requires 41 years to reach us. Yet this is one of the closest stars known to astronomers! It is much larger than our sun, the star that we know best, for its diameter is 25,500,000 miles, almost thirty times that of the sun, 864,392 miles. It gives out 112 times as much light.

\* \* ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



MARS AND JUPITER

*These conspicuous planets are only a degree apart as June begins.*

Another interesting thing about Arcturus is that it is the second most rapidly moving of the bright stars. Though often called "fixed stars," in contradistinction to the planets, the stars are continually moving through space. To us on the earth this motion has two components. One is the motion across the sky, which can be measured by comparing the positions of the stars at different times. This is called "proper motion." The other is the motion towards or away from us, which is called "radial velocity."

Star Light Reveals Motion

This can be detected by an analysis of the star's light through the spectroscope. Since the spectroscope is scarcely a century old, determinations of radial velocity are comparatively modern, but the first proper motions were found as long ago as 1718, by a famous astronomer whose name is best known in association with the comet which he studied—Edmund Halley, astronomer royal of England. In that year he announced that Arcturus, Sirius and Procyon (the latter two stars being visible in the winter skies) had changed their positions since they were first charted by the ancients. Of the stars bright enough to be shown on these maps, only alpha Centauri moves as rapidly as Arcturus, and that cannot be seen from the latitude of the greater part of the United States. However, the distance of Arcturus is so great that even this great speed, which amounts to 77 miles per second, will only take it the diameter of the moon in 785 years.

Two other first magnitude stars remain in the June evening sky, but

neither are well placed. These are Pol-lux, one of the twins, Gemini; and Capella, in Auriga, the charioteer. Both are visible in the northwest, close to the horizon behind which they will soon disappear for several months. Capella is really brighter than Arcturus, but because of its position in the sky it now looks considerably fainter. The greater thickness of the earth's atmosphere through which its light has to travel absorbs a considerable amount of it.

One astronomical event of June that is always welcome occurs on Wednesday, the 21st, at 4:12 p. m., E.S.T. This is the summer solstice, which marks the beginning of summer. At that moment the sun reaches its farthest north position in its annual trip around the sky and starts moving southwards once more. On this day it is above the horizon for a greater time than on any other day of the year, and, by the same token, the night is then the shortest. It sets then about 30 degrees north of the east point of the horizon. Thus, in the late afternoon at this time of the year we have the unusual phenomenon of the sun shining on the north side of buildings. The same effect can also be seen in the early morning, if one is up and about at such an hour!

*Science News Letter, June 3, 1933*

Last summer was so hot in Iceland that there was a shortage of ice there.

From the overlapping vertical photographs taken from above Mount Everest and surrounding country, the British expect to map this mountain wilderness which is nearly impossible to chart by ordinary methods.