ASTRONOMY

# Scorpion Moves Across Sky

## Venus and Saturn also shine on July evenings. Characteristic constellations of the summer nights are easily spotted in the southern sky.

By JAMES STOKLEY

➤ WITH THE coming of July, the characteristic constellations of the summer evening appear in the southern skies. The most conspicuous of these is Scorpius, the scorpion, which is directly south, as shown on the accompanying maps. These are drawn to show how the skies appear at about 10:00 p.m., your own kind of standard time (or 11:00 p. m. for daylight saving time), at the beginning of July, and an hour earlier in the middle.

Scorpius is easy to recognize because of the curved line of stars to the left that form the animal's tail, while the star Antares, distinctly red in color, is supposed to represent its heart. To the right of this group we find Libra, the scales, and then Virgo, the virgin, in which the bright star Spica appears. Farther west, in the same figure, is the planet Saturn.

Continuing still farther west, we come to Leo, the lion, present location of Venus, brightest of all the planets. Regulus, the most brilliant star in this group, is not shown on the maps because it has set by the time for which they are prepared. However, it can be seen earlier in the evening. On July 5, Venus passes quite close to this star.

To the left of the scorpion is Sagittarius, the archer, in which the stars form an easily recognized teapot. The spout of the pot is towards the right, and the handle to the left. Some of these stars also form a little dipper, known as the "milk dipper," doubtless because it stands in the brightest part of the Milky Way. The four stars that make the handle of the teapot outline the bowl of the dipper. Its handle extends upward to the right, in two of the stars forming the teapot's lid.

Directly above Sagittarius and Scorpius is a large constellation which contains no first magnitude stars. This was shown on the old star maps as a man holding a serpent. The reptile is represented by the constellation of Serpens, part of which is on each side of Ophiuchus. Serpens is the only constellation in the sky divided into two parts. The serpent's head is to the right and the tail to the left, toward the stars of Aquila, the eagle.

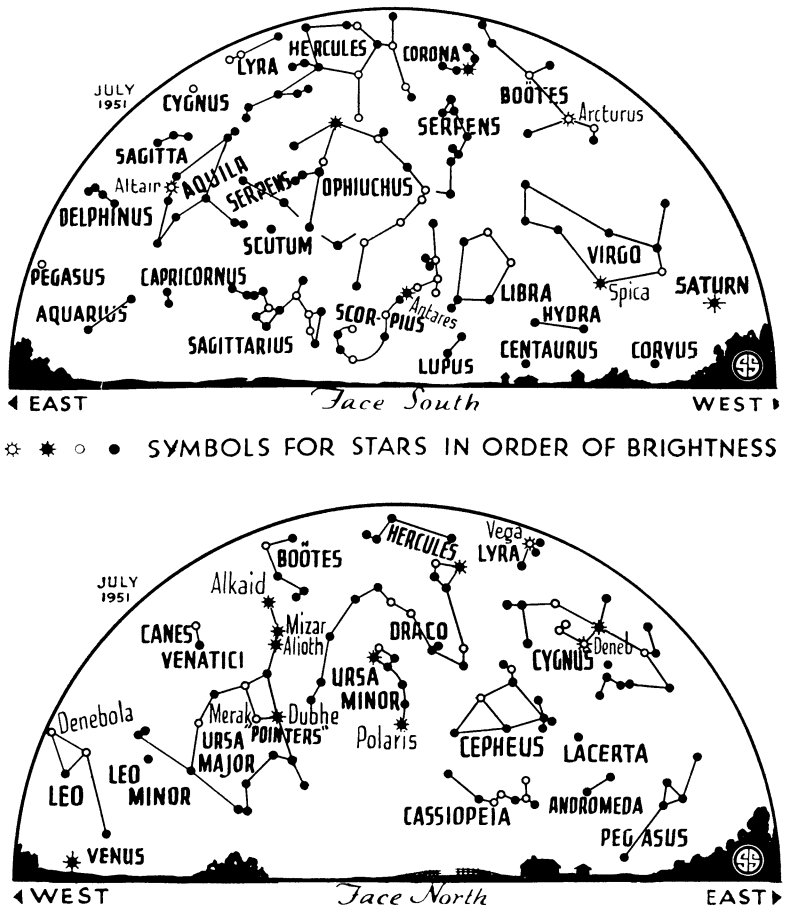
Aquila contains the bright star Altair. Moving upwards, we come to Lyra, the lyre, with Vega, which is the brightest star seen these summer evenings. Of course it is not nearly as bright as the planet Venus, or Jupiter, which comes up later. Below Vega, toward the northeastern horizon, is Cygnus, the swan, with the star called Deneb.

Toward the northwest we see the Great Dipper, the bowl downwards. At the bottom are Merak and Dubhe, the so-called pointers, whose direction, to the right, shows Polaris, the pole star. This is in the little dipper at the end of the handle, which now points downwards.

Following the curve of the handle of the Great Dipper we come in the south to Arcturus, in Bootes, the bear-driver. This is the last of the stars of the first magnitude to be seen these evenings.

As for the other planets, Jupiter comes up around midnight, in the constellation of Pisces, the fishes. It is about a sixth as bright as Venus, though about seven and a half times the brilliance of Vega. By the end of July Jupiter will appear about three hours after the sun sets.

Mars and Mercury are not easily visible in July. Though the former is in the east just before sunrise, and the latter in the west just after sunset, both are so low that




the light of dawn and dusk makes it hard to locate them.

The next few months afford us the best opportunity of the year to see the Milky Way, which extends high across the eastern sky, through the constellations of Sagittarius, Aquila, Cygnus, and Cassiopeia. Unfortunately, it cannot be seen in competition with the glare of city lights, but summer vacationers are able to discern it from vantage points in the country or mountains. To them it appears as a luminous trail well justifying the lines of Milton, which describe it as a "broad and ample road whose dust is gold and pavement stars."

From ancient times the Milky Way was a subject of speculation, much of it fanciful. The Egyptians regarded it as the heavenly Nile, which flowed through the land where the dead live in perpetual happiness. Much later, the Norsemen knew it as the path of the ghosts going to Valhalla. The American Indians had a similar idea, according to Longfellow, who has Nokomis teaching the young Hiawatha and showing him "the broad white road in heaven . . . crowded with the ghosts, the shadows, to the Kingdom of Ponemah, to the land of the hereafter."

The Greeks speculated more scientifically about its nature. One of their philosophers, Parmenides, who lived in the 5th Century B. C., considered that the sun and moon were formed of matter detached from the Milky Way. But a century later Democritus hit upon its correct explanation when he said it was caused by a great multitude of faint stars.

This speculation was not confirmed, however, until the invention of the telescope, and its application to astronomy by Galileo in 1610. His own observations showed that it was not made of nebulous material, as many had believed, but that, as he wrote, "it is nothing else but a mass of innumerable stars planted together in clusters."

Although Galileo showed what it was, he did not explain why the stars should be so crowded together in that direction to give such an effect. That was not to come until a century or more later, as astronomers began to learn the structure of the star-system of which we are part. According to modern ideas this system—the galaxy—has the shape of a watch, and includes something like 30,000,000,000 stars, as well as approximately an equal mass of dark material between them. Its diameter is about 100,000 light years. That is, light which travels 186,000 miles a second, would take a thousand centuries to go completely across. Its thickness is something of the order of 10,000 light years.

Our solar system is not at the center of the galaxy, but about two-thirds of the way out to the edge. The center is toward the constellation of Sagittarius. Thus, we are surrounded in all directions by stars, but when we look towards the edge of the galaxy, we can see into a much greater depth than if we look out toward the sides. Therefore, we find a great many more stars in those directions. Since they are so distant that we cannot distinguish them separately with the naked eye, they seem to merge into the Milky Way. Thus, the stars are not necessarily more closely packed in those directions, but they are far more numerous.

Moreover, since the center of the watch-shaped system is toward Sagittarius, we see the greatest aggregation of stars in that direction. This explains why that is the brightest part of the Milky Way. Indeed, we would see even more were it not for the dark material, also most concentrated in that direction. Photography by infrared rays cuts through these clouds to some extent, and such pictures show many more stars toward Sagittarius than are revealed in photographs taken by rays similar to those to which the eye is sensitive.

### Celestial Time Table for July

| July | EST | |
|---|---|---|
| 2 | 11:00 p. m. | Moon farthest, distance 252,600 miles |
| 4 | 2:48 a. m. | New moon |
| | 5:00 p. m. | Sun farthest from earth, distance 94,459,000 miles |
| 8 | 3:27 a. m. | Moon passes Venus |
| 10 | 10:36 a. m. | Moon passes Saturn |
| 11 | 11:56 p. m. | Moon in first quarter |
| 17 | 6:00 p. m. | Moon nearest, distance, 222,600 miles |
| 18 | 2:17 p. m. | Ful moon |
| 24 | 7:19 a. m. | Moon passes Jupiter |
| 25 | 1:59 p. m. | Moon in last quarter |
| 28 | Early a. m. | Meteors visible radiating from constellation of Aquarius |
| 29 | 1:00 a. m. | Venus at greatest brilliancy, magnitude minus 4.2 |
| 30 | 7:00 a. m. | Moon farthest, distance 252,000 miles |

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

Science News Letter, June 30, 1951

INVENTION

## Sonic Device Aids Towing Glider in Heavy Overcast

➤ SAFETY TO a glider plane being towed in deep overcast by a powered plane is aided by a sonic device which brought patent 2,557,900 to Robert L. Wallace, Jr., Coolidge, Texas, and Harold L. Ericson of Los Angeles. Rights are assigned to the Secretary of the Navy.

The towing plane emits special sound signals picked up in the glider by a device converting them into visual meter readings. Noise signal will carry to the glider in spite of noise conditions in the air.

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