ASTRONOMY

Jupiter and Saturn Prominent

Jupiter is brighter than any star or planet now seen in the sky. The sun is over three million miles farther away from earth in July than it was six months ago.

By JAMES STOKLEY

THIS MONTH, two bright planets are added to the normally prominent stars that shine in the south on July evenings. These planets are Jupiter, largest of the bodies, of which the earth is one, that revolve around the sun; and Saturn, famed for its system of rings. The rings, of course, are only visible with telescopic aid.

Both planets are shown on the accompanying maps, which give the sky's appearance about ten p.m. at the beginning of July—your own kind of standard time (add one hour for daylight saving). By the middle of July the sky will appear like this an hour earlier, and by the end of the month two hours earlier.

Since Jupiter, with magnitude minus 2.1 on the astronomical brightness scale, is more brilliant than any other star or planet now visible, you can locate it easily.

It is in the constellation of Sagittarius, the archer, although it is not far from the boundary between that group and Ophiuchus, the serpent-carrier. Saturn is farther east, i.e., to the left. Its magnitude is 0.3, which is quite bright, although only about a ninth as brilliant as Jupiter.

Below Jupiter is the hook-shaped line of stars that mark the tail of the scorpion, Scorpius. The rest of the constellation extends westward, toward Libra, the scales. Brightest star in Scorpius is Antares, which is distinctly red in color. Its magnitude is 1.2, which makes it less than half as bright as Saturn.

High overhead you can see the most brilliant star of the summer evening: Vega, in Lyra, the lyre. As shown on the maps, it is a little east of the zenith. With a magnitude rating of 0.14, it is even brighter than Saturn. (The smaller the positive number, the brighter the star; negative numbers indicate even brighter objects, on a scale of increasing brilliance for larger numbers).

Below Vega is the constellation of Cygnus, the swan, with the star called Deneb. A little to the right, toward the south, is another bird, Aquila, the eagle, in which you see Altair.

To the northwest is the great bear Ursa Major, with the smaller group called the big dipper. It hangs downward, now, with Alkaid at the top. Merak and Dubhe, at the bottom, are the well-known pointers. They show the direction, toward the right, of Polaris, the pole star, in Ursa Minor, the little bear. If you follow the curve of the dipper's handle toward the south you come to Arcturus, in Bootes, and farther south, to Spica, in Virgo, the virgin.

Although only Jupiter and Saturn are shown on our maps, Venus is also in the evening sky, although not easy to see. On June 22 it passed behind the sun, and now it follows that body across the sky. Thus, it remains above the horizon for a short time after sunset, but not long enough to be easily seen. By November, however, it will set about two hours after sunset, and then it will be conspicuous in the western evening sky.

Mercury is not visible at all in July. It comes between the sun and earth—at the position called inferior conjunction—on July 16. Mars is visible in the east, in the constellation of Taurus, the bull, in the early morning. It rises about three hours before the sun.

Despite the fact that we are now entering the time of year when warm weather is expected, the sun is now farthest away from the earth. Men once thought that the planets could only move in circles, but years ago the great German astronomer, Johann Kepler, showed that they move in ellipses, which are elongated circles. The sun is not located in the center of the ellipse, but at a point called the focus, off a little to one side. And as the earth goes around the sun each year, sometimes it is close to this focus, and to the sun. At a times six months later it is as far from the sun as it can be.

Earth Nearest Sun in January

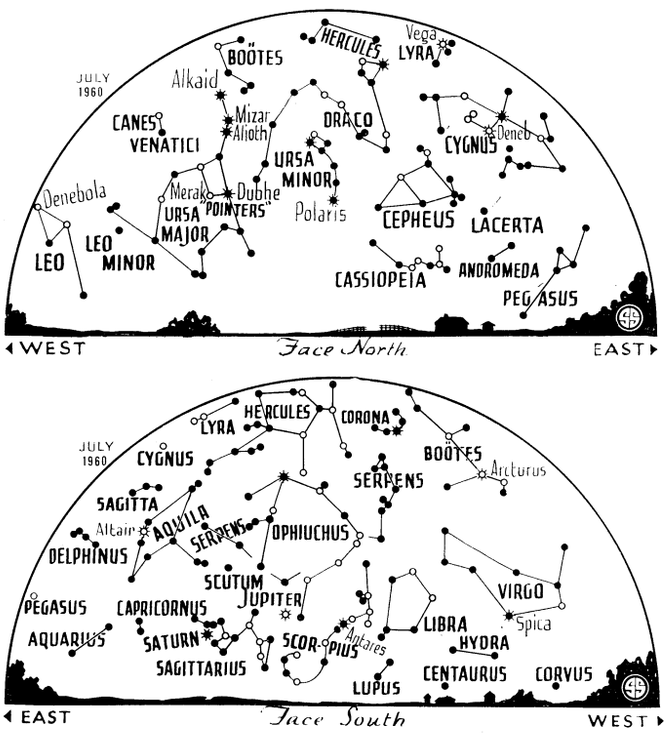
Last Jan. 4 the earth was nearest the sun, which was then 91,342,000 miles away. Ever since that date the distance has been increasing. It reaches its maximum on July 2, with 94,452,000 miles.

Even though the sun is more than three million miles farther away than it was six months ago, we do not have cold weather because its rays are shining more directly on those of us who live in the Northern Hemisphere.

Last January, even at noon, when the sun was at its highest for the day, it was only 27 degrees above the southern horizon —for a place at 40 degrees north latitude, which is typical for the U. S. But in early July, at noon, the sun is 73 degrees above the horizon.

Because it is now so much closer to being overhead, the sun's rays fall more directly upon us. A yard-square beam of solar radiation, with its light and heat, covers only slightly more than a square yard of ground. But last January, when it was so low at noon, this same yard-square beam had to cover more than two square yards, because it came at such a low angle.

And also, in July, the sun is in the sky many more hours that it is in January, when the days are short, and its heating effect continues for a longer proportion of the time. These effects are many times greater than the slight cooling in July produced by the sun's greater distance, which does tend to limit the extremes to which heat and cold can go.



☼ ✸ ○ ● SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

In the Southern Hemisphere conditions are reversed. For people there the sun is now low at noon; winter has begun. And next December, when the sun again is low for us, it will be high over Argentina and Australia, etc., and summer will start in the Southern Hemisphere.

Earlier in this article the positions of the planets were discussed. There are generally considered to be nine: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto. These are the "major" planets; Mercury, the smallest, is about 3,000 miles in diameter. But also there are many thousands of asteroids, tiny planets, of which the largest are only a few hundred miles in diameter; the smallest, only a fraction of a mile.

One of the largest of these is called Vesta. It is about 240 miles in diameter, and even though three others are somewhat larger, it is the brightest of them all. Evidently it reflects light better than they do, for the asteroids, like the major planets, are visible only by the sunlight they reflect.

During July, Vesta makes a close approach to the earth. On July 2 it will be directly opposite the sun, and at a distance of 107,500,000 miles. It will then be in Sagittarius, just a little to the east of Saturn, and of the sixth magnitude, which is usually considered to be the limit of naked-eye visibility. But this means under the very best conditions, and being so low in the sky a telescope will be needed to see Vesta, even on the second. But at least, as you look at Saturn and Jupiter, you can think that there is also a third planet between them.

Celestial Timetable for July 1960

July	EST	
1	10:49 p.m.	Moon in first quarter.
2	9.00 a.m.	Vesta opposite sun and nearest earth, distance 107,500,000 miles.
	5:00 p.m.	Earth nearest sun, distance 94,452,000 miles
7	1:00 a.m.	Saturn opposite sun and nearest earth, distance 839,400,000 miles
	7:00 a.m.	Moon passes Jupiter
8	6:00 a.m.	Moon nearest earth, distance 221,900 miles
	1:00 p.m.	Moon passes Saturn
	2:37 p.m.	Full moon
15	10:43 a.m.	Moon in last quarter
16	8:00 p.m.	Mercury passes between sun and earth
17	Noon	Moon passes Mars
21	9:00 a.m.	Moon farthest, distance 252,500 miles
23	1:31 p.m.	New moon
31	7:39 a.m.	Moon in first quarter

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

Science News Letter, June 25, 1960

Do You Know

Corinthian *bronze* is said to have been produced first in the Roman burning of Corinth in 146 B.C., when streams of molten copper, gold and silver mingled in the streets.

Malaria is transmitted from person to person by female mosquitoes of certain species of the genus Anopheles.