ASTRONOMY

Two Bright Planets Visible

Venus can be seen at early dusk in the west while Jupiter will be visible at night in the southeast. Brightest among the stars will be Vega.

By JAMES STOKLEY

➤ TWO bright planets are now visible in the evening skies. Soon after the sun has gone down, if you look toward the west, you will be able to spot Venus as a brilliant "evening star" in the constellation of Cancer, the crab, although at that time none of the stars around it will be apparent. Venus is now of magnitude minus 3.3 on the astronomer's scale, which is considerably brighter than any other star or planet, so it is quite easy to identify.

Although Venus follows the sun below the horizon about an hour and 20 minutes later, by that time Jupiter will be visible in the southeast, in the constellation of Sagittarius, the archer. This giant planet is now about two fifths as bright as Venus, of magnitude minus 2.3. Since it will appear in a completely dark sky, while Venus is seen in the gathering dusk, there may not seem to be such a difference between them.

The position of Jupiter (but not of Venus, since it sets too early) is indicated on the accompanying charts of the July evening skies. These are drawn for about 10:00 p. m., your standard time, at the first of the month, and an hour earlier at the middle. (Add an hour if you are on daylight time.)

Vega Brightest

Brightest among the stars that are shown is Vega, in Lyra, the lyre, which is high in the east. Below it, and a little toward the north, can be seen Deneb, in Cygnus, the swan. About as high, but more southerly, we can see Altair, in Aquila, the eagle. It is below the western part of Aquila that we find Sagittarius, present home of Jupiter. In this group are two characteristic figures, one of which is called the "milk dipper." The bowl of this implement is formed by the four stars indicated on the map directly about the "riu" in the word Sagittarius, while the handle is formed by the two stars extending upwards and to the right, toward the "m" in Scutum (the shield), the constellation directly above.

The other figure in Sagittarius is the teapot, of which the handle is formed by the same four stars that make up the bowl of the milk dipper. The two stars that form this dipper's handle also mark the lid of the pot, and its spout is to the right, next to the curved row of stars that make the tail of Scorpius, the scorpion. From the way that the teapot tilts over as the night advances, it is sometimes said that the hot tea is poured out on the scorpion's tail!

In Scorpius is the bright star, definitely red in color, called Antares. As we move farther west, toward the right, we come next to Libra, the scales, a constellation with no first magnitude stars. After Libra comes Virgo, the virgin, with first magnitude Spica. Continuing, to the right of Virgo, low in the west, Leo, the lion, can be located. Saturn, another planet, is in this group, and is indicated just above the horizon, where it is quite faint. Earlier in the evening, however, you can see it better, near the bright star Regulus, which is not shown. Above Virgo is Bootes, with first-magnitude Arcturus.

Toward the north there are no stars of the first magnitude, though some very familiar groups may be seen. Chief of these is the one in Ursa Major, the great bear, called the "Big Dipper." It hangs with the handle upwards, in the northwest. The two stars at the bottom of the dipper's bowl, Merak and Dubhe, are the pointers, which show the direction of Polaris, the pole star, in the north. This, in turn, is at the end of the handle of the little dipper, the bowl of which is above, and is part of Ursa Minor, the little bear.

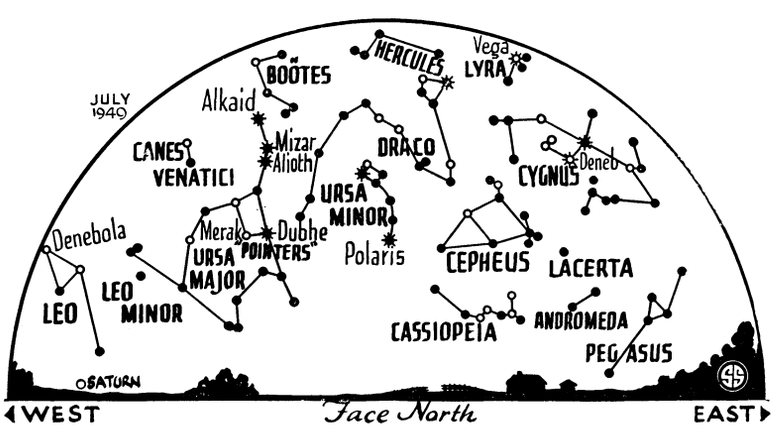
Winding around this group is Draco, the dragon, whose head is close to Hercules, the strong man, a group directly overhead for the times the maps indicate. To the right of Ursa Minor, just below one of the curves in the body of the dragon, is Cepheus, the king, and just beneath this figure one finds the W-shaped group of Cassiopeia, his queen.

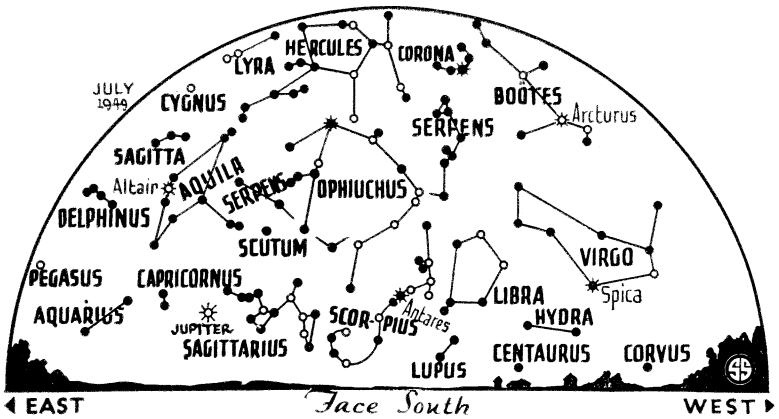
At the beginning of July, low in the east, the planet Mercury can be glimpsed just before sunrise. Mars is in the same part of the sky, and can be seen a little before sunrise in the constellation of Taurus, the bull. Because of its distance from the earth, it is now quite faint, of the second magnitude.

To the unaided eye the planet Jupiter, which shines so brilliantly in the south, is a conspicuous object, but it becomes more interesting when seen through a small telescope. Then one can see its four largest moons, part of the system of 11 satellites (there may be even more still undiscovered) that revolve around the planet. On the night of July 7, for example, one of the four will be seen to the west, and the other three toward the east. The following night, however, only two will appear, as the others will be in front of the planet's disk. The next night all four will be visible again, but with one to the east and the others to the west. On July 10 all four will be to the west, but on the following nights, up to the 15th, two will be visible on each side. They will not, however, always be the same satellites, on the one side or the other, and their distances will be different. On the 16th two will be seen, both to the west, the remaining pair this time being behind the planet. Diagrams showing these configurations are published each year by the U. S. Naval Observatory in the American Ephemeris, which is the astronomer's bible.

Satellite Discovery

These satellites and their movement were discovered in the year 1610 by the Italian astronomer Galileo Galilei, and they were used in 1676 by a Danish astronomer named Olaus Roemer, who was working in Paris, to make the first determination of the speed of light. Jupiter and the earth both revolve about the sun, the former at a mean distance of 483,300,000 miles and the latter at 93,000,000 miles. When the two planets are in the same direction from the sun, as they are on July 20, they are closest. This month they are 382,300,000 miles apart. However,





☼ ✸ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

when Jupiter is on the far side of the sun, it is about 186,000,000 miles (the diameter of the earth's orbit) farther away.

In the half century following Galileo's discovery of these moons of Jupiter, astronomers began to make predictions as to when they would disappear behind the planet and make their reappearance. When Roemer observed these events, and measured their times accurately, he found that sometimes they were earlier and sometimes later than the prediction. Puzzled at first, he finally realized that they were early when Jupiter was closest to us, and late when it was farthest away. This gave him the clue to a correct explanation of the differences. The eclipses, etc., took place on schedule, but when Jupiter was on the far side of the sun the light had to travel all the way across the orbit of the earth. On the other hand, when the two planets were on the same side of the sun, the light had a much shorter path.

As a result, he announced in a paper to the French Academy of Sciences, published Dec. 7, 1676, that light takes 22 minutes to cross the earth's orbit, so that it would require 11 minutes to get from the sun to the earth. Modern observations make it 8 minutes 19 seconds, which corresponds to a speed of light of 186,000 miles per second.

Time Table for July

July	EST	
2	4:00 p. m.	Earth farthest from sun, distance 94,453,000 miles
	5:00 p. m.	Moon nearest, distance 229,800 miles
10	2:41 a. m.	Full moon
	8:00 p. m.	Moon passes Jupiter
16	9:00 p. m.	Moon farthest, distance 251,000 miles
18	1:01 a. m.	Moon in last quarter
20	3:00 a. m.	Jupiter nearest earth, distance 382,300,000 miles
23	6:07 a. m.	Moon passes Mars
25	2:33 p. m.	New moon
27	1:22 p. m.	Moon passes Venus
28	early a. m.	Meteors of Delta Aquarid shower visible
	8:00 p. m.	Moon nearest again, distance 227,600 miles
31	1:00 a. m.	Moon passes Saturn at distance of about a third the lunar diameter

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

Science News Letter, June 25, 1949

Oslo, capital of Norway, has 170 square miles of land within the municipal area, about three times as much as the District of Columbia; much of it is "wild" terrain, with moose, deer, wild cats, foxes, rabbits and badgers roaming at large.

ERRATA, Vol. 55, Nos. 1-26, January-June, 1949

PAGE	TITLE BEGINS	CORRECTION
15	New Insect Immigrants	Headline, Immigrants *for* Emigrants.
28	African Dams	Last par., line 5, Lake Victoria *for* Victoria Falls.
62	Record-Breaking Cold	Par. 5, line 10, Montana *for* Wyoming.
114	British Lead in Bevatron	See Letters to Editor, p. 132.
130	Vitamin B_{12}	Line 1, after B_{12} *insert* per unit of weight.
131	Menhaden is America's	Par. 3, lines 7, 8, *read* the fish meal is used for animal and poultry feed and fertilizer.
152	Scientists, Too, Object	Line 4, Bitter *for* Bittner.
152	Disease-Bearing Villains	Villains *for* villians.
172	Mercury Vapor	Line 6, after generator *add* since the war.
220	FIDO	Last line, droplets *for* vapor.
260	Blood Test for Cancer	Col. 2, line 13, prostate *for* prostrate.
268	New Conducting Plastics	Col. 2, line 14, mercury *for* copper.
297	Americans and Canadian	Par. 4, line 4, the *for* an.
340	Canners	Col. 2, line 12, in the 1840's *for* 1819.
347	British Get	Line 5, *read* McGregor Fund, Detroit. *Delete* rest of sentence and Par. 5.