ASTRONOMY

Jupiter, Evening Planet

With the arrival of June, it is the only planet remaining in the evening sky. Saturn sets too soon after the sun to be seen easily.

By JAMES STOKLEY

➤ WITH THE ARRIVAL of June, only one planet remains in the evening sky. This is Jupiter, appearing in the southwest in the constellation of Leo, the lion. As it is brighter than any other star or planet (minus 1.6 in the scale used by the astronomer), one has little difficulty in locating it. Its position is indicated on the accompanying maps, which show the appearance of the sky at 11:00 p. m., your own kind of war time, on June 1, and an hour earlier on the 15th. Similarly they would show the appearance at 9:00 p. m. at the end of June, only then the sky will hardly be dark enough to show the stars.

Brightest of the stars now seen (and which, unlike planets, shine by their own light like our nearest star, the sun) is Vega, in lyra, the lyre. This is in the northeast. Just below Lyra is Cygnus, the swan, with first magnitude Deneb, though its low position at this time makes it seem fainter. This is the reason that its symbol on the maps is that for the second magnitude. The same is true of the star shown just above the northern horizon—Capella, in Auriga, the charioteer. Actually, this is brighter than any of the stars shown, except Vega, and when we see it high overhead on winter evenings we can fully appreciate it. But when it is so low, its light has to pass through a great thickness of the earth's layer of atmosphere and apparently it drops to third magnitude. To the left of Auriga is part of Gemini, the twins, in which we see Pollux, likewise fainter than normal.

Arcturus in South

High in the south is the bright star Arcturus, in Bootes, the bear driver, and below it is Spica, in Virgo, the virgin. Next to this group, below and toward the left, is Libra, the scales, in which there are no bright stars. But next to Libra we come to part of Scorpius, the scorpion, with first magnitude Antares, red in color, which will be so prominent in the southern evening sky during the coming summer months.

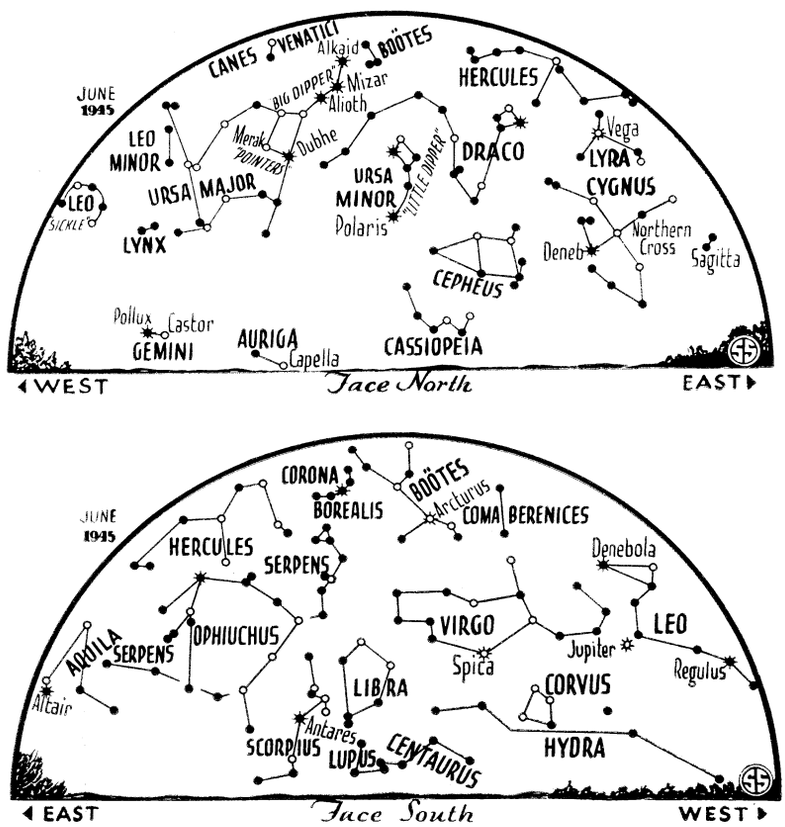
Just below Libra are parts of the constellation of Lupus, the wolf, and Centaurus, the centaur. The latter is the one in which alpha Centauri, nearest star to the earth (except the sun) is located. In this age it does not rise for people in most parts of the United States. It is visible, however, from the southernmost parts of Florida and Texas.

There are two other first magnitude stars (also indicated by second magnitude symbols because of their lowness) shown on the maps. One is Regulus, in Leo, the lion, the group in which Jupiter appears. This is in the west. Directly opposite is Altair, in Aquila, the eagle.

One welcome astronomical event of June is the summer solstice, which occurs on June 21 at 2:52 p. m. EWT. Then the sun reaches its farthest north position in the sky and, for us in the northern hemisphere, summer begins. In the southern hemisphere, on the contrary, this marks the start of winter.

Though Jupiter is the only planet well placed for evening visibility in June, Saturn is also in the evening sky but sets too soon after the sun to be seen easily. It is in Gemini, the twins, below Castor and Pollux. On June 11, there will be an occultation of Saturn, with the moon passing in front of it and hiding it for about an hour. This will occur during the day, however, and will not be visible. This is also true, though for a different reason, of a partial eclipse of the moon which will occur June 25, as the moon partly enters the shadow of the earth. It happens while the moon is below the horizon for this part of the world, but it will be visible from the Pacific, Indian and Antarctic Oceans, Asia, Australia and southeast Africa.

Rising in the east well before sunrise, and shining there even more brilliantly than Jupiter, is Venus, which was so brilliant in the evening sky until a few



Do You Know?

The *cashew nut* and poison ivy belong to the same plant family.

Meat from exercised *cattle* is more tender than that from more close-stalled animals.

Gallium, a little known chemical element, is 150 times as abundant as silver.

Over 20 different *chemicals* and materials are used in the ordinary kitchen match.

The word *protein* was coined about 1839 by Mulder, who lived from 1802 to 1880.

Formerly almost all of the *cigarette paper* for U. S. smokes was imported from France; now it is made in America.

Piston rings of gray cast iron have been replaced in many war engines by stronger ones, alloyed of iron, nickel, chromium and molybdenum.

Because of incessant *rains* during last fall, that prevented plowing and seeding, France expects a short wheat crop this year.

The production of *silk* was a closely guarded secret in China for many centuries; in the third century A.D. the Koreans brought the art to Japan.

U. S. Forest Service *"smoke-jumpers"* and their flame-fighting tools are parachuted to forest fires in regions inaccessible by roads.

Tarnish is removed from silverware by placing the silver in an aluminum pan and heating in a mild solution of soda; electrolytic action carries the tarnish to the aluminum, darkening it somewhat but leaving silver bright.

months ago. And near it is the planet Mars, still faint, but beginning to brighten. Early in June Mars and Venus approach to within a distance about ten times the moon's diameter, but then they draw apart again.

From a correspondent in Boston comes a question about magnitudes of stars and planets. The astronomer's system, with its minus and plus magnitudes, may seem rather complicated, but one need only consider the whole series of numbers, whether negative or positive, as continuous, with two one less than three, one as one less than two, zero one less than one, minus one one less than zero, minus two one unit less than minus one, and so on. And the lower the number, the brighter is the object. Magnitude six is brighter than magnitude seven, and so also, magnitude minus two is brighter than magnitude minus one.

Goes Back 1700 Years

The system goes back some 1700 years, to the Alexandrian astronomer Ptolemy, who wrote a famous book on astronomy, called the *Almagest,* in which appeared the first catalog of stars, giving their relative brightnesses. Ptolemy divided them into six classes, or "magnitudes." The brightest he put in the first magnitude, while in the sixth he placed those which could just be seen. After the telescope came into use in the seventeenth century, still fainter stars were observed, and so the system was extended. With the largest telescope today, the 100-inch at Mt. Wilson, it is possible to see stars down to the 19th magnitude and to photograph them as faint as the 22d.

In 1830 Sir John Herschel, in England, found that an average star of the first magnitude was just about a hundred times as bright as the average sixth magnitude star, and that the same ratio applied even down through those too faint to be seen with the naked eye. To provide a uniform and scientific system, another English astronomer, named Pogson, proposed in 1850 that a fixed scale of stellar magnitudes be adopted, with each magnitude just 2.512 times the brightness of the next fainter class. This figure was selected because this ratio makes a difference of five magnitudes exactly 100 times the difference in brilliance. Lists of stars usually give their magnitude to the nearest tenth, which is the least that an expert can distinguish, although the "electric eye," or photoelectric cell, can detect variations of a hundredth of a magnitude.

Ptolemy grouped all the brightest stars together as first magnitude. Sirius is about fifteen times, or three magnitudes as bright as Regulus, though both were placed in this class. Therefore, when the magnitude scale was placed on a scientific basis, it was necessary to provide places for the brighter stars, and so the scale was extended downwards, to zero and to negative magnitudes. But even here the same Pogson's ratio holds; i. e., minus one magnitude represents a star 2.512 times as bright as magnitude zero, minus three 2.512 times as bright as minus two, and so on. Sirius is thus placed at magnitude minus 1.6; Venus, as seen in the morning sky this month, minus 4; the full moon minus 12.5 and the sun minus 26.7.

Celestial Time Table for June

June	EWT	
3	9:15 a.m.	Moon in last quarter
6	7:51 a.m.	Moon passes Mars
	5:17 p.m.	Moon passes Venus
7	4:00 p.m.	Moon nearest, distance 225,900 miles
10	12:26 a.m.	New moon
11	2:02 p.m.	Moon passes Saturn
16	5:22 p.m.	Moon passes Jupiter
19	1:00 p.m.	Moon farthest, distance 251,400 miles
21	2:52 p.m.	Sun farthest north, beginning of summer in northern hemisphere
24	3:00 p.m.	Venus farthest west of sun
25	11:08 a.m.	Full moon; partial eclipse of moon visible in eastern hemisphere

Subtract one hour for CWT, two hours for MWT, and three for PWT.

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AERONAUTICS

Superfortress Gets Fighter-Plane Engines

➤ LIQUID-COOLED in-line engines of the type common to such fighter planes as the P-38, P-40 and P-51 now power an experimental B-29 Superfortress, replacing the radial aircooled engines with which the plane is usually equipped. The object of the experiment was to give additional flight data and experience in the use of in-line liquid-cooled engines as applied to heavy bombers, the Air Technical Service Command at Wright Field reports.

Cooperating with the Air Forces in the successful test was the Allison Division of General Motors, manufacturers of the engine. Prior experience in the use of the liquid-cooled engine in heavy airplanes had been gained in work with the modification of the B-19, in which similar engines were installed.

With the new engines the modified B-29, known as the XB-39, develops a total of 10,400 horsepower from its four engines.

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