

ASTRONOMY

Jupiter Still Conspicuous

Jupiter is still prominent in the sky, but the chief events on the September celestial calendar are two eclipses, one of the moon, the other of the sun.

By JAMES STOKLEY

► WITH THE ARRIVAL of September, Jupiter is still the most conspicuous of the stars or planets seen in the evening sky. And near this planet there is another—Saturn—considerably fainter but still prominent.

Both of these objects are shown on the accompanying maps. These depict the sky as it appears about 10 p.m. your own kind of standard time (add one hour for daylight saving time), an hour earlier in the middle of September and two hours earlier at the end.

Both are in the southwest, in the constellation of Sagittarius, the archer, with Jupiter toward the right. Earlier in the evening than the hours for which the maps are drawn they will be visible higher, and toward the east.

The brightest star of these evenings is Vega, in Lyra, the lyre, which you can see high in the west. Just above it—practically overhead, in fact—you will find Cygnus, the swan. Part of this star group is shown on our northern sky map, part on the southern. In it is the star Deneb, which is rated by astronomers, like Vega, as of the first magnitude. So is Altair, high in the south, in Aquila, the eagle.

Three other first-magnitude stars appear near the horizon, so their low altitude causes a considerable diminution in their brightness. This is due to increased absorption of their light as it has to pass through a greater thickness of the earth's atmosphere than if the star were overhead.

One of these stars is Fomalhaut, toward the southeast in Piscis Austrinus, the southern fish. To the northeast you will find Capella, in Auriga, the charioteer, while Arcturus, in Bootes, is toward the northwest.

There are a number of other constellations which contain no first-magnitude stars but are still of considerable interest. Toward the northeast, for example, are five stars forming a letter W resting on its left-hand side; this is Cassiopeia, the queen. Her husband, the king Cepheus, is next to her, to the left, below Cygnus.

Farther left you will find the snakelike form of Draco, the dragon. The head is at the top, and the figure winds downward until it ends just above the bowl of the great dipper, part of Ursa Major, the great bear. And Ursa Minor, the little bear, is between Draco and Cassiopeia. In it is Polaris, the pole star.

Another prominent "landmark" of the sky is the "great square," toward the east. Most of this figure is in Pegasus, the winged horse, which is just below Cygnus, but the northernmost star in the square is in Andromeda.

Two other planets are now visible during the evening hours, but not at the proper time to get them on our maps. Look toward the western horizon soon after sunset and you may see Venus, which is even brighter than Jupiter. It sets less than an hour after the sun, while the sky is still quite bright, which makes it hard to find. And a little before midnight Mars rises in the east. It is in Taurus, the bull, which is next to Aries, the ram, a group that is shown.

Two Eclipses Visible

The chief events on the celestial calendar for September are two eclipses, one of the moon, the other of the sun, both of which will be visible over a large part of the United States and Canada. The first, a total lunar eclipse, occurs during the night of Sept. 4-5. Then, on Sept. 20, comes a partial eclipse of the sun.

Both earth and moon, like any solid body, cast shadows into space, on the side away from the sun, and these shadows consist of two parts. The full shadow, called the umbra, is at the center; in this region the sun's direct light is cut off entirely. Around this is a partial shadow, the penumbra. Here the earth or moon only partly hides the sun.

Every time the moon is full it is in the opposite direction from the sun. You might think that this would invariably bring the moon into the earth's shadow, and that we would have an eclipse of the moon every time it is full. But generally at this phase the moon is well to the north or south of the earth's shadow, even of the penumbra.

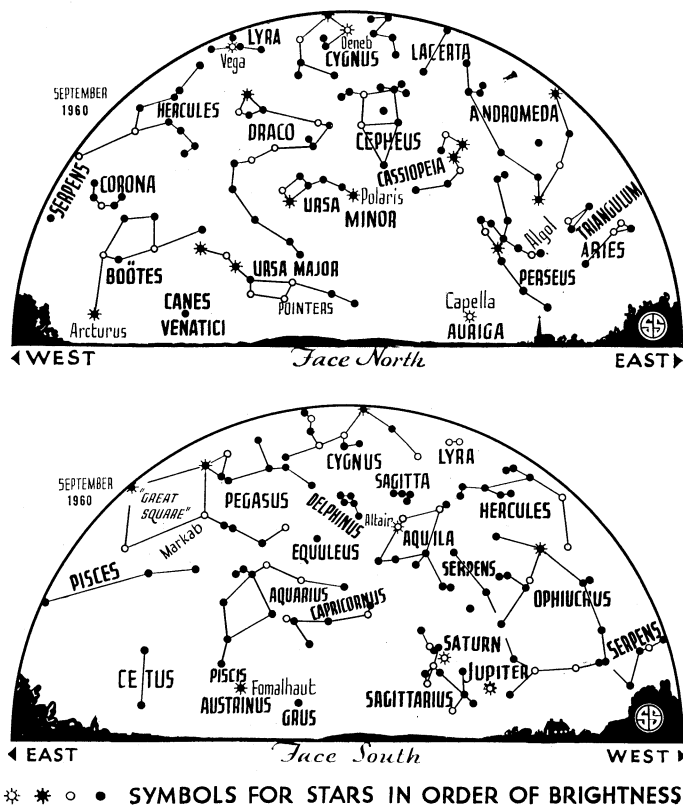
Similarly, when it is new, the moon is approximately between earth and sun, but generally the lunar shadow passes north or south of earth, and there is no eclipse. However, at the time of the September full moon, early Monday morning, Sept. 5, moon, earth and sun will be directly in line, so there will be a total lunar eclipse as the earth cuts off our sunlight.

Along the Atlantic seaboard sunrise occurs just about the time the total eclipse is beginning, so people in that part of the country will see only the first partial phases. Farther west there will be a better view, and the entire eclipse will be visible along the Pacific Coast.

If you get a good view, you will see:

First of all, even though the moon is in the penumbra, there will not be much effect and it will look as it does normally when full. Then, at Stage I, the eastern edge of the moon will begin to dim, and for the next hour the edge of the umbra will creep across the lunar disc.

From II to III moon will be totally eclipsed—but it will not be dark. Instead it will have a coppery red glow, caused by sunlight bent around into the umbra by the



earth's atmosphere. As it goes through, the blue light is scattered, to give the daytime sky its blue color, and the light that falls on the moon is reddened. Between III and IV the edge of the umbra will again be seen creeping across the moon's face, until finally it will be shining again, as it was before the eclipse started.

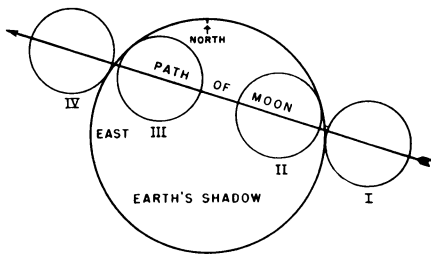
About two weeks after this, on Sept. 20, as the moon has gone half of an orbital revolution around the earth, its shadow will fall on our planet. This will only be the penumbra; the umbra will not reach us. Consequently, at no place on earth will the sun be totally hidden. Again the eastern seaboard misses the show, for eclipse starts after sunset in this part of the country.

Along a line running approximately from Montreal to Mobile, Ala., the eclipse will begin just as the sun is setting; to the west of this line, therefore, something may be seen. And in the western third of the nation sunset will not come until the eclipse is over.

The farther north one happens to be, the longer the eclipse will last. Near San Diego it will be about 40 minutes from start to finish, while near Eureka, Calif., it will last about 50 minutes. Near Seattle, however, it will last a full hour.

First you will see a slight nick in the edge of the solar disc, as the moon starts to encroach upon it. This will get larger, until the maximum eclipse, and then it will get smaller, as the event comes to an end.

If you live in a region where the eclipse is visible, be sure to use some protection for the eyes when watching it. Looking at the sun without adequate protection can cause irreparable harm to the eyes. Several thicknesses of exposed photographic film serve the purpose. Sunglasses are **NOT** sufficient protection.



Total Eclipse of Moon— Night of Sept. 4-5, 1960

The large circle represents the shadow of the earth, and the small circles indicate the successive positions of the moon as it passes through the shadow. At I the moon starts into the shadow; at II the total eclipse begins and the middle of eclipse occurs; at III the total eclipse ends; at IV the moon leaves the shadow. The four phases occur at the following times (all a.m.):

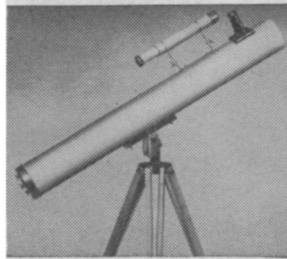
	EST	CST	MST	PST
I	4:36	3:36	2:36	1:36
II	5:38 6:21	4:38 5:21	3:38 4:21	2:38 3:21
III	7:05	6:05	5:05	4:05
IV	8:07	7:07	6:07	5:07

(Continued on p. 143)

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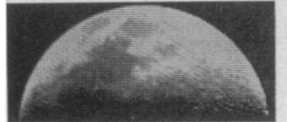
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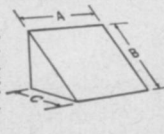


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Leukemia kills 12,000 Americans each year, one every 45 minutes.

The Philippines is the third largest *English-speaking nation*, after the United States and the United Kingdom.

About 72% of all Americans see a doctor at least once a year, while six percent require 20 or more *doctor visits*.

Questions

AERONAUTICS—How long did it take Capt. Kittinger to reach ground after his jump? p. 131.

ASTRONOMY—What do the three moon maps depict? p. 131.

PSYCHOLOGY—How can velvet gloves help to cure cat phobia? p. 133.

Photographs: Cover, G. T. Schjeldahl Co.; p. 131, U. S. Air Force; p. 133, Chicago Natural History Museum; p. 144, Home Haircut Guide Co.

Jupiter Still Conspicuous

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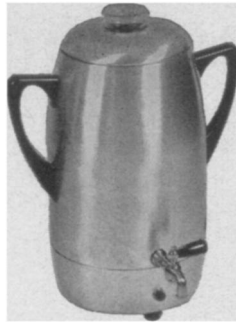
Celestial Time Table for September

Sept.	EST	
1	3:00 a.m.	Moon passes north of Saturn
2	4:00 p.m.	Moon nearest, distance 226,400 miles
5	6:19 a.m.	Full moon, total eclipse of moon
12	5:20 p.m.	Moon in last quarter
13	5:00 a.m.	Moon passes south of Mars
14	1:00 p.m.	Moon farthest, distance 251,400 miles
20	6:13 p.m.	New moon, partial eclipse of sun
22	5:00 p.m.	Moon passes north of Venus
	8:00 p.m.	Sun over equator, autumn commences in Northern Hemisphere
27	5:00 a.m.	Moon passes north of Jupiter
	8:13 p.m.	Moon in first quarter
28	9:00 a.m.	Moon passes north of Saturn
29	5:00 p.m.	Moon nearest, distance 229,400 miles

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

• Science News Letter, 78:134 August 27, 1960

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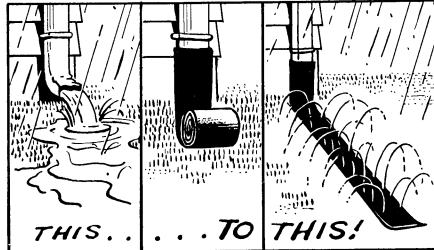


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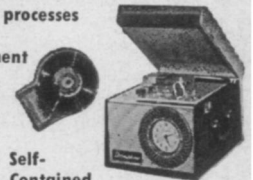
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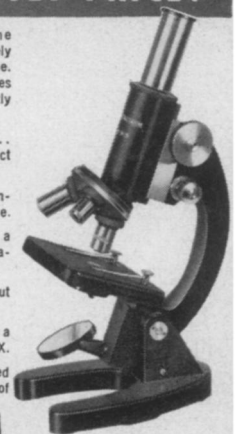
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