

## ASTRONOMY

# Total Solar Eclipse Coming

A total solar eclipse, taking place on Oct. 2, is a highlight of the astronomical year. It will be visible in part of the United States.

By JAMES STOKLEY

THE MAIN feature on the astronomical program for October is the first total eclipse of the sun visible in any part of the United States or Canada since 1954 and the last until 1970. On Friday morning, Oct. 2, people who live east of a line extending approximately from the eastern shore of Lake Michigan to Tallahassee, Fla., will see the sun rise at least partially eclipsed by the moon. That is, they will see it if the sky is clear along the eastern horizon.

And, for a few favored locations in Massachusetts (including Boston) and southern New Hampshire, the rising sun will be totally eclipsed. It will be completely hidden by the moon and its outermost layer, the corona, will be visible around it. With the intense glare of the solar disc cut off, the faint corona comes into view.

Of course, clouds or early-morning mists may well interfere with the view of the total eclipse around Boston. However, from Massachusetts, the path along which it is visible extends over the Atlantic Ocean, toward the Canary Islands and the coast of Africa. There a much better view is likely. Many astronomical expeditions have traveled to these locations, to make the observations that can best be carried out when the sun is thus hidden.

## Jupiter and Saturn Seen

As for the evening skies of October, two bright planets are visible, but you will have to look rather early to see one of them. Jupiter, the brighter, is in the constellation of Scorpius, the scorpion, and sets, at the beginning of October, only two hours after sunset. Thus it does not appear on the accompanying maps, which depict the sky as it appears about 10 p.m. your own kind of standard time (add one hour for daylight saving time) at the first of October, an hour earlier at the middle and two hours earlier at the end.

Jupiter is now about seven and a half times as bright as Saturn, the other planet, which is in Sagittarius, the archer. Part of this constellation is shown on our maps, but not that in which Saturn stands. This planet sets in early October about four hours after the sun, just a little before the times for which our maps are drawn.

The brightest star of these evenings is Vega, high in the west in Lyra, the lyre. Second brightest is Capella, in Auriga, the charioteer, which is in the northeast. Then comes Altair, toward the southwest, in Aquila, the eagle, a little to the left of Lyra. And above Lyra (shown partly on the

northern map and partly on the southern) is Cygnus, the swan, with the star called Deneb.

Low in the east Taurus, the bull, is coming into view, with Aldebaran. While this star, like the others mentioned, is of the first magnitude, its low altitude makes it appear fainter than it would when higher in the sky. This is true also of Fomalhaut, in Piscis Austrinus, the southern fish, low in the south.

Although it contains no first-magnitude stars, a prominent October constellation is Pegasus, the winged horse, which is high in the south. In this is the "Great Square" and if you know it, you will be able to locate several other groups. Alpheratz, the star in the upper left-hand corner of the square, is in the next-door constellation of Andromeda, the chained princess. Below the square are the fishes, Pisces. The line of stars beginning with Markab, in the lower righthand corner of the square, is supposed to form the horse's head, and below it is Aquarius, the water-carrier. And off to the right of Pegasus is Cygnus, which we have already mentioned.

Although Jupiter and Saturn are the only evening planets at present, Venus is a brilliant object in the east after it rises about

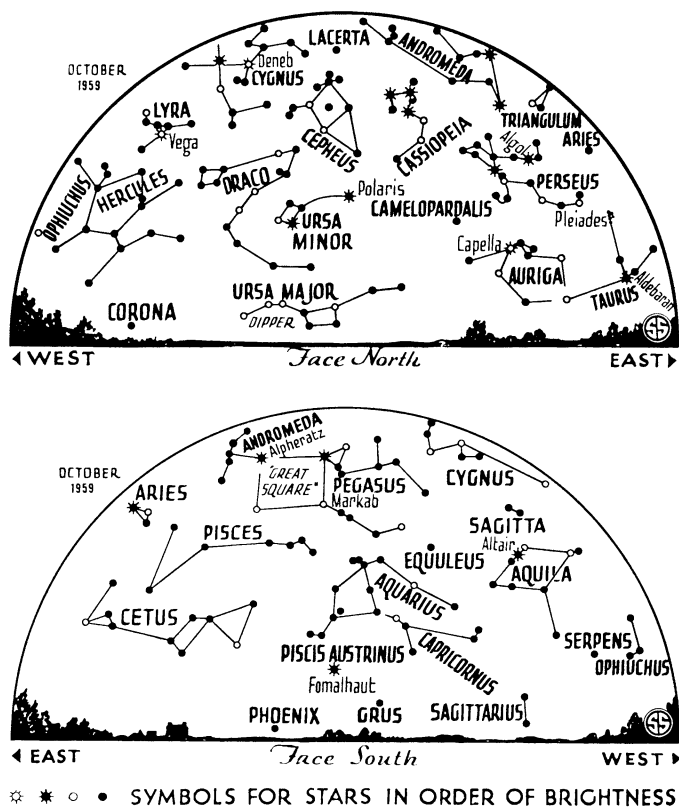
three hours before the sun. It is in the constellation of Leo, the lion, and it will be of maximum brilliance on Oct. 8. After that it will gradually fade and will go behind the sun next June, reappearing next autumn as a brilliant evening star. Mercury and Mars are now too nearly in line with the sun to be seen; the latter passes behind it on Oct. 29.

Referring again to the total eclipse, it is rather curious that the last two such events which were visible in the United States also were seen just after sunrise.

A total eclipse of the sun occurs when the moon's shadow sweeps across the earth. Because the sun is so much bigger than the moon the lunar shadow tapers to a point at about our distance. Sometimes it fails to reach earth at all. If at such a time the moon passes in front of the sun that body is not completely hidden; there is a ring of the solar disc visible around the moon, and we have what is called an annular eclipse.

But with a total eclipse, the tip of the shadow does reach the earth. It may be a hundred miles or so in diameter, and it sweeps across land and sea, from west to east, tracing out the long ribbon-shaped path of totality, from which the total eclipse is visible. Over a much larger area there is a partial eclipse, with the moon coming only partly in front of the sun.

On July 9, 1945, the shadow tip touched earth at sunrise in Idaho, so the path of totality started there and went northeast-



ward across Canada and Hudson Bay. Then came one on June 30, 1954. The path began, at sunrise, in Nebraska and again it went to the northeast.

This time the shadow touches earth as the sun is rising a little to the west of Gardner, Mass. Then the path extends to the east, and on the coast it goes from Newbury, at the north, to Quincy, at the south. The center line, where the total eclipse lasts longest, about 55 seconds, goes through Marblehead. This is about 15 miles northeast of downtown Boston. But even from Marblehead the sun will be only about twice its own diameter above the sea horizon as totality starts. Even if the sky above is clear, a low-lying mist may well prevent observations.

Despite this, however, many astronomers from the Boston area, as well as from other parts of the United States, will set up instruments along the Massachusetts coast in this region, hoping that luck will be with them, and they will see this rare event.

But if they do not, they will only have to wait until 1970 for the next total eclipse of the sun visible in the United States. On March 7, the path of totality will pass across northern Florida and the coastline of Georgia and the Carolinas. This will be in mid-afternoon, so the weather chances should be fairly good.

### Celestial Time Table for October

Oct.	EST
2	7:31 a.m. New moon (total eclipse of sun visible about 5:50 a.m. from Mass., partial eclipse visible at sunrise over eastern U. S. and Canada).
	8:11 p.m. Algol (variable star in Perseus) at minimum brightness.
4	4:00 p.m. Moon nearest, distance 226,000 miles.
5	6:42 p.m. Moon passes Jupiter.
7	11:59 p.m. Moon passes Saturn.
8	6:00 a.m. Venus at greatest brilliancy, in early morning sky.
16	10:58 a.m. Full moon.
20	1:04 a.m. Algol at minimum. 2:00 p.m. Moon farthest, distance 252,100 miles.
22	9:52 p.m. Algol at minimum.
24	3:22 p.m. Moon in last quarter.
25	6:41 p.m. Algol at minimum.
28	8:40 a.m. Moon passes Venus.
31	5:41 p.m. New moon.

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

Science News Letter, September 26, 1959

## Questions

**CHEMISTRY**—How does carrageenin aid in the treatment of peptic ulcers? p. 195.

**DENTISTRY**—How long do you use your teeth in normal function during the day? p. 199.

**GEOGRAPHY**—What device could help pinpoint Europe's geographic position within 50 to 90 feet? p. 197.

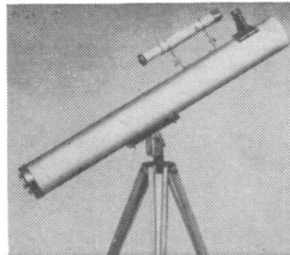
**PHYSICS**—Where are the banana-shaped shells that surround the earth? p. 200.

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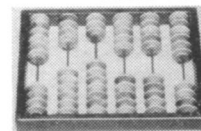
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