

ASTRONOMY

# Double Feature

## Eclipse of the Moon and a Meteor Shower Are Among The Attractions in the Evening Skies of August

By JAMES STOKLEY

**A** TOTAL eclipse of the moon and a shower of meteors are the chief events on the astronomical schedule for the month of August. The eclipse, second of the year, will occur on the evening of Tuesday, August 25, while the meteors will be seen to best advantage in the early morning hours of Wednesday, August 12. These belong to the Perseid shower, they seem to radiate from the constellation of Perseus, which rises in the northeast about midnight.

Thus, perhaps, this month makes up to some extent for the lack of naked-eye planets in the evening sky. However, if you stay up late the night of the eleventh to see the meteors, some of the planets will appear also. Saturn, in the constellation of Taurus, the bull, rises in the southeast about 1:00 a. m. Jupiter, still brighter, follows in Gemini, the twins, about 3:15 a. m., and Venus brightest of all and also in Gemini, about an hour later.

The stars of the August evening are depicted on the accompanying maps. These are made to show the sky at about 11:00 p. m. at the beginning of the month and at 10:00 p. m. in the middle. Vega, almost directly overhead, is the brightest star. It marks the constellation of Lyra, the lyre. Then comes Arcturus, in Bootes, which is in the west, and may be located by following the curved line of the handle of the great dipper.

### Antares Is Red

Antares, in Scorpius, the scorpion, low in the south, may be recognized by its distinctly red color. Deneb, in Cygnus, the swan, is high in the eastern sky. It is in a southeasterly direction from Vega. Altair, in the southeast, forms part of Aquila, the eagle, and has one fainter star just above and another just below, which help you locate it.

Actually, there are two eclipses this month, though the first one does not amount to very much. Both earth and moon, which get all their light from the sun, cast long, invisible shadows out into space. These shadows are each in two parts. At the center there is a dark core, called the umbra, into which no direct

sunlight reaches. But around this is an outer part—the penumbra—from which the body casting the shadow only partially eclipses the sun.

On August 11, when it is evening in the United States and Canada, the penumbra of the moon's shadow just touches the earth—in the South Pacific Ocean near Antarctica. Now it is mid-winter in that part of the world, comparable with February on the northern coast of Alaska, so it is unlikely that any ships will be there. And if they are, good weather is not very probable. Even if the eclipse were observed, all that would be visible at best would be a little nick in the edge of the sun's disk—covering about a twentieth of its diameter. So it will not be much of an eclipse.

### Lunar Eclipse

But, though no part of North or South America, Europe, Asia, Africa or Australia will see the partial eclipse of the sun on August 11, a large part of the world will view the total eclipse of the moon two weeks later. Then, on August 25, the moon will have moved halfway around in its earth-encircling orbit, and will enter fully into our shadow. Practically all of North and South America will see it all. The beginning will be visible to Europe and Africa as well as southeastern Asia.

In the accompanying diagram is shown the interesting part of what will happen. When the moon enters the penumbra, at 9:02 p. m., EWT, nothing noticeable will

be observed. At 10:01 p. m., as indicated by the small circle at the right, the moon begins to make contact with the umbra, the large shaded circle. An hour later it is completely in the shadow. Then the moon takes on a coppery hue.

The color is an effect of the bending of the sun's light by the earth's atmosphere into the umbra and on the eclipsed moon. Since the atmosphere takes blue rays out of the light in passage—to make the blue sky—that which gets through is reddened.

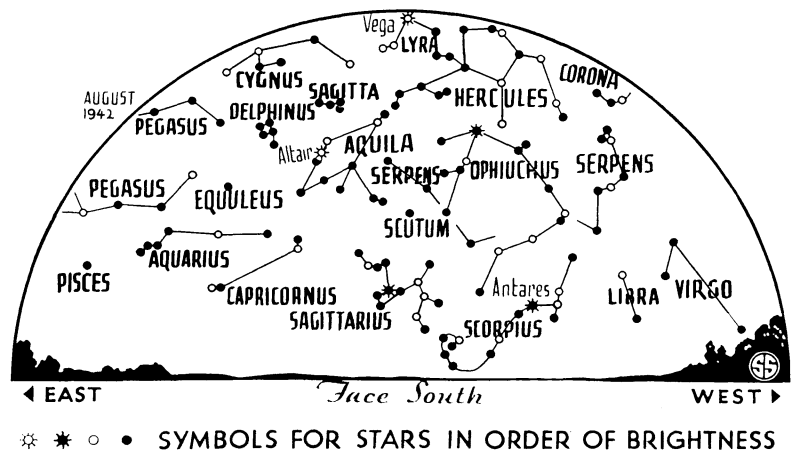
### Over at 2.34 a.m.

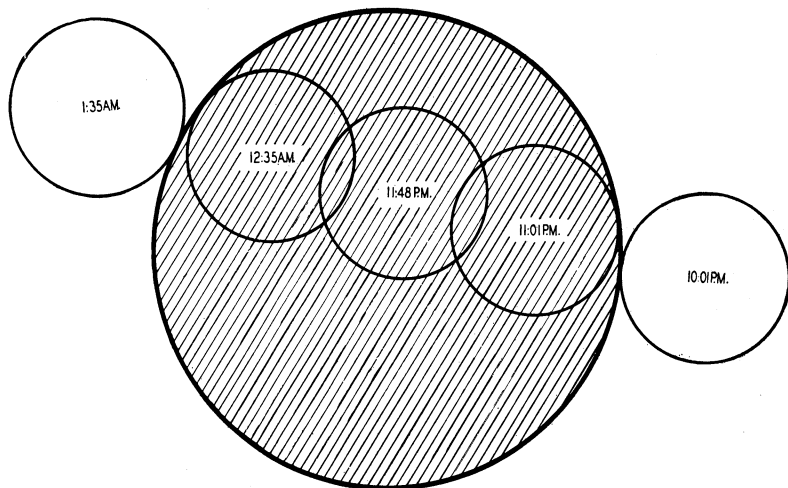
At 12:35 a. m. the moon begins to emerge from the shadow, and an hour after this it is completely out. Since the moon will still be in the penumbra, it will be noticeably darker than usual when full, but it will gradually brighten until 2:34 a. m., when it is out of the shadow entirely, and all phases of the eclipse are over.

Summarizing, the time table is as follows, with Eastern War Time throughout:

	EWT, Aug. 25
Moon enters penumbra.....	9:02 p. m.
Moon enters umbra .....	10:01 p. m.
Total eclipse begins.....	11:01 p. m.
Middle of eclipse.....	11:48 p. m.
	Aug. 26
End of total eclipse.....	12:35 a. m.
Moon leaves umbra.....	1:35 a. m.
Moon leaves penumbra.....	2:34 a. m.

Such eclipses of the moon are not of great scientific value, but they do make an impressive spectacle to watch. It is particularly interesting to see the curved, and fairly sharp, shadow of the earth on the moon's surface while it is entering





PHASES OF ECLIPSE

The interesting part of the total eclipse of the moon on the evening of August 25 is shown in this diagram, prepared by the astronomical staff of the Franklin Institute, Philadelphia. The large shaded circle is the dark core, or "umbra," of the earth's shadow; the small circles represent, at the times indicated the moon, which is moving from right to left, that is, west to east. North is at the top, and the times are all E. W T.

and leaving the umbra—clear proof, if it is needed, that we live on a sphere.

The other feature on the month's bill, the meteor shower, is perhaps somewhat less spectacular than the eclipse, but will still be of considerable interest. We always see more of these meteors, often called "shooting stars," after midnight than before. Then we are on the forward side of the earth, and meet them head-on. They are tiny bits of cosmic dust, that are burned in a flash of light by friction with our atmosphere.

On an ordinary night, in an hour, you should see one or two, but late on the night of August 11, you should see that many a minute. That is because we then pass through one of several swarms—the debris of comets of past ages. Actually they come in parallel paths, but perspective makes them converge in the distance,

like the tracks of a railroad. This is toward the constellation of Perseus, hence they seem to radiate from that part of the sky. Of course, a bright moon will cause so much glare that many of the fainter meteors are not visible. This year the moon is new on the 11th (as it must be at the time of a solar eclipse), so it will not offer any competition with the Perseid shower.

Celestial Time Table for August

Saturday, Aug. 1, 12:00 p.m., Venus passes Jupiter. Monday, Aug. 3, 7:04 p.m., moon in last quarter. Thursday, Aug. 6, 4:49 a.m., moon passes Saturn. Friday, Aug. 7, 9:00 a.m., moon farthest, distance 251,900 miles. Sunday, Aug. 9, 1:11 a.m., moon passes Jupiter; 5:16 p.m., moon passes Venus. Tuesday, Aug. 11, 10:28 p.m., new moon; partial eclipse of sun. Wednesday, Aug. 12, early a.m., Perseid meteors. Wednesday, Aug. 25-6, 11:01 p.m. to 12:35 a.m.,

quarter. Sunday, Aug. 23, 5:00 a.m., moon nearest; distance 226,700 miles. Tuesday-Wednesday, Aug 25-6, 11:01 p.m. to 12:35 a.m., total eclipse of moon. Tuesday, Aug. 25, 11:46 p.m., full moon. Eastern War Time throughout.

Science News Letter, August 1, 1942

MEDICINE

Bacteriophage Conquering Dysentery in Alexandria

BACTERIOPHAGE, the germ-eater, is conquering bacillary dysentery in Alexandria, Egypt, Dr. Arthur Compton, director and pathologist-in-chief of the Laboratory Service, Alexandria Municipality, reports (*British Medical Journal*).

In Alexandria, he reports, patients with bacillary dysentery died at the rate of 25 out of every 100 in 1928. Since 1938 only about 5 out of every 100 patients with this disease have died. In Cairo and the rest of Egypt the situation has not been so favorable. Case mortality rates for Cairo have varied between a maximum of over 60% in 1928 to a minimum of 25% in 1938.

The difference, in Dr. Compton's opinion, is due to bacteriophage, which physicians of Alexandria now give regularly to patients showing the first signs of dysentery. Since 1930, moreover, the Municipal Public Service in Alexandria has "budgeted annually for commercial bacteriophages for the specific treatment of bacillary dysentery and like conditions in the municipal hospitals and children's clinics.

"Thus the phage therapy (treatment) has been employed in Alexandria on an important scale for at least 12 years," Dr. Compton reports. "In Cairo, phage has not been used to any appreciable extent until recent years and the rest of Egypt may be considered as practically not having known phage therapy at all."

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