

ASTRONOMY

# December Brings Eclipse

## Crossing International Date Line, Solar Veiling Begins a Day After It Ends; Winter Arrives

By JAMES STOKLEY

**T**HOUGH Jupiter has left the evening sky, the other two planets—Saturn and Venus—which have been visible during the autumn are still present, and Venus is getting brighter. In fact, it is now, with the exception of the moon, the most brilliant celestial object seen in the night sky. It is in the constellation of Capricornus, in the southwest just after twilight is over. Because it sets before the times for which the maps are drawn (10:00 p.m. on Dec. 1, 9:00 p.m. on the 15th, and 8:00 p.m. on the 31st) it is not possible to indicate it there, except for the end of the month.

Saturn is in the constellation of Aquarius, to the southwest, and is unusually faint, because the plane of its thin, flat system of rings is this month in line with the sun, and consequently they are not as well illuminated as they were a few years ago. Then the sunlight reflected from the rings contributed a considerable share to the total brightness of the planet. In spite of this, it is still as bright as most of the stars and can easily be recognized.

The third planet of the month may be glimpsed during Christmas week. On Dec. 29, Mercury is at its greatest distance east of the sun, and will go below the horizon about an hour and a half after sunset. It will be visible below and to the right of Venus in the twilight for a few days around this date.

Much later at night another planet appears, namely Mars. Rising about 2:00 a. m., in the constellation of Virgo, its red color will make it easily apparent to anyone who happens to be watching the eastern sky at that hour.

### Brightest Sirius

The winter display of stars is returning, mostly to the southeast. Brightest of all is Sirius, the dog star, in Canis Major, the great dog, which is near the horizon. Above it are three stars in a nearly vertical row. These form the belt of Orion, the warrior. The bright, rather ruddy, star to the left is Betelgeuse, and the one to the right is Rigel. Above Orion can be seen Taurus, the bull, with red Aldebaran to mark his eye. This is

a member of a V-shaped group, called the Hyades, and above these is a smaller cluster of six stars, the Pleiades.

Almost directly east, and near the horizon, is Procyon, marking the lesser dog, Canis Minor. Climbing upwards from this group, we pass through Gemini, the twins, Castor and Pollux. The latter star is the brighter of the two, and occupies the lower position. Then comes Auriga, the charioteer, with Capella.

### Pegasus

Resting upon a corner, to the west, is the great square of Pegasus, but the star in the upper corner is Alpheratz, in the neighboring group, Andromeda. High in the north is Cassiopeia, shaped like an inverted W. In the northwest, the northern cross of Cygnus, the swan, with Deneb at its top, is sinking out of sight. Quite low in the northwest Vega appears, in Lyra, the lyre. The great dipper is beginning to climb in the northeast, the tip of the handle still scraping the horizon.

On Dec. 13 occurs the year's second, and last, eclipse of the sun. The first one, on June 19, was visible across

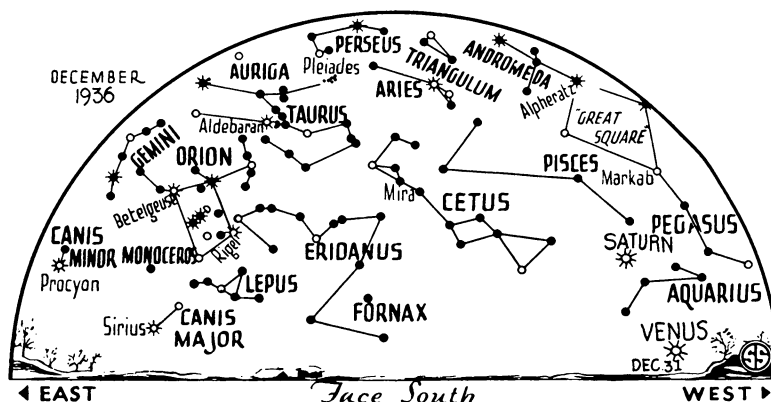
Europe, and Asia. Many of the world's astronomers were attracted to its path to make important observations. This month Australia, New Zealand, and the south Pacific are the favored regions, but astronomers will give it little attention.

### Not Total

The lack of interest comes because this month's eclipse is not total, but annular. That means that at no time will the sun's disk be hidden completely by the moon; its corona will not appear and none of the usual eclipse observations will be possible. Because of the slight change in the sun's distance during the year, at certain months it is apparently a little larger than others. The moon also changes its distance and its apparent size during the month.

Total and annular eclipses occur when the sun and moon are in line with the earth. Their apparent diameters are about the same, and the variations in distance have the effect of sometimes making one look a little larger, sometimes the other. If the proximity of the moon makes it the larger, it completely covers the sun's disk and a total eclipse is the result, as happened last June. This month, however, the sun is almost at its closest of the year, making it look bigger than otherwise. The moon, on

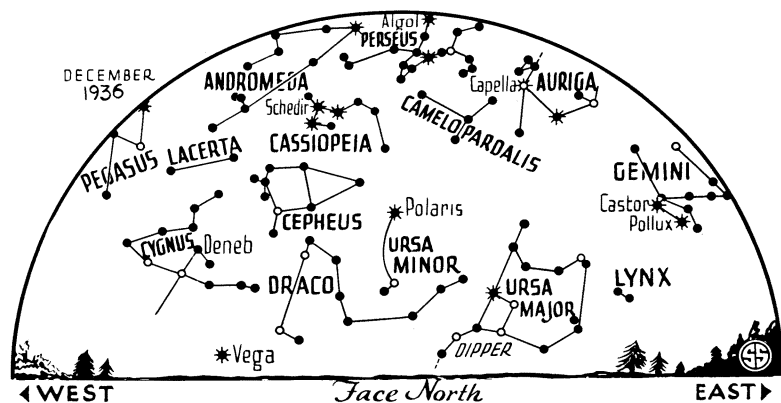
☆ \* ○ ● SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



### BRIGHTEST

*Venus, low in the west after sunset, is the most brilliant object in the heavens during the coming month. During Christmas week, look in the same neighborhood for the seldom seen Mercury. If you happen to be abroad at the romantic hour of 2 a.m., look low in the east for ruddy Mars.*





### IT NEVER SETS

*The great dipper is always to be seen in the northern skies, but this month it is so low that it grazes the horizon.*

the date of the eclipse, is only a few days past apogee, the time of its greatest distance of the month. Thus, even when the moon is seen squarely in front of the sun, it will not cover the latter's disk. A narrow ring of the sun will always remain in view. This is called the annulus, the Latin word for the ring, and hence such an eclipse is known as an annular eclipse.

### Crosses Date Line

Another interesting feature of this eclipse is that it begins on the day after it ends. Its path crosses the International Date Line. Here the new day begins. From this line the day gradually shifts westward, until after 24 hours it has encircled the world and the following day begins, to go through the same process. When the eclipse starts, off the northwestern coast of Australia, it will be sunrise of Monday, Dec. 14, for that day will several hours before have reached that point. In Auckland, New Zealand, it will be almost noon of Monday, when the sun is covered to the greatest extent. But then, as the eclipse view shifts eastward, it crosses the Date Line. Then it is afternoon, but of Sunday, because Monday is still some hours away. And when it ends, in mid-Pacific, it will be at Sunday evening sunset. Though this feature is curious it is not unusual, for many eclipse paths cross the Date Line, and whenever one does this condition obtains.

Perhaps of more interest to us will be the event of 7:27 p.m., Monday, Dec. 21. At that moment the sun reaches the southernmost position in the sky. This is called the winter solstice, and marks the beginning of winter. On that day the sun rises farthest to the south of the east point, climbs to the lowest noon day position of the year,

and sets farthest south of the west point. With its path across the sky so shortened, it takes it less time to get across than on any other date and this is the shortest day of the year.

The fact that the sun then shines on us for a shorter time than in summer partly accounts for the winter season. But the low altitude of the sun is even more important. Its rays fall upon the ground of the northern hemisphere at a low angle, and they are spread over a much larger area than in June, when the noon day sun is nearly overhead.

The moon's phases in December are shown below. It will be in apogee (farthest from earth) at 3:00 p.m. on the ninth, 252,100 miles away. Perigee, when it is closest of the month, comes at 4:00 p.m. on Christmas day, when its distance is but 225,900 miles.

### Phases of Moon

E. S. T.

Last Quarter . . . .	Dec. 5,	1:20 P.M.
New Moon . . . . .	Dec. 13,	6:25 P.M.
First Quarter . . . .	Dec. 21,	6:30 A.M.
Full Moon . . . . .	Dec. 27,	11:00 P.M.

*Science News Letter, November 28, 1936*

### MEDICINE

## Army Medical Library Celebrates Its Centennial

**A**N OUTSTANDING American institution is celebrating its hundredth birthday this year. Although relatively few Americans may ever have heard of it, its fame has spread all over the world.

This institution is the Army Medical Library, or, as it is also known, the Library of the Surgeon-General's office. It is housed in a modest red brick build-

ing adjacent to the Smithsonian Institution. Within this building may be found a collection of rare and historic medical specimens, photographs, and a veritable treasure mine of medical literature. The Library contains 1,000,000 items, 400,000 of which are books. It has been called "the best medical library in the world."

The Army Medical Library played an important part in the development of medicine in America and, according to Dr. Henry E. Sigerist, medical historian, "has made itself felt all over the world."

"It is probably the only case in history," Dr. Sigerist states, "where a military authority in one country has contributed so much to international knowledge."

The high esteem in which the library is held may be seen from the fact that Sir Humphrey Davy Rolleston, one of England's most eminent physicians, journeyed to this country especially to deliver the oration of the evening at the library's 100th birthday party, held in the library building in Washington on Nov. 16.

You can find in this library references to everything of importance on medicine and allied subjects that has ever been published in any language "since the world began." These references are available through the world-famous Index Catalogue which the library publishes. This Catalogue was started by the library's first librarian, John Shaw Billings, to whom also goes credit for building up the library itself.

The Index Catalogue was started in 1880. Since then three series, making up 47 large volumes, have been published. One series takes from 15 to 20 years to complete. Every year one volume containing 75,000 to 100,000 references is published.

Besides publishing the Index Catalogue, which goes to libraries and medical institutions all over the world, the library receives and makes available a vast store of medical literature. About 1,800 medical journals in 18 different languages are regularly received. Of the 600 known medical incunabula (books dating before 1500 A.D.) in the world, the library contains 450. It has the largest and most complete series of French theses on medicine to be found anywhere in the world. This collection is not even approached in France itself. The number of German theses on medicine in the Army Medical Library is even larger.

The work of the library is carried on by a staff of 26 persons.

*Science News Letter, November 28, 1936*