

ASTRONOMY

Moon Eclipses Sun

Shadow will move across the earth on Jan. 25. War conditions will prevent the usual thorough astronomical observations of the phenomenon.

By JAMES STOKLEY

➤ WAR will prevent observation of one of the most important astronomical events of January—which will occur on the 25th. On that day the shadow of the moon will sweep across the earth—in other words there will be a total eclipse of the sun.

The shadow will touch the earth in the Pacific Ocean near the equator, directly south of lower California, at sunrise, which will be about 9:45 a.m., EWT. Reaching South America, it crosses the town of Chiclayo on the coast of Peru. Then across inland Brazil, finally reaching the Atlantic Coast of that country at Fortaleza. Next, the speeding shadow crosses to Africa, racing and leaving behind any transport or military planes that may be making that crossing. Freetown, Liberia, is in the track. The shadow passes inland, leaving the earth as the sun is setting on the Tamgak mountains, in French West Africa. It will then be 2:04 p. m. EWT. That is, about 4 hours 20 minutes will be required for the shadow to make its journey of thousands of miles.

Path of Total Shadow

As the shadow traverses the earth, it traces a path of totality. In this path, a hundred miles or so in width, the moon will completely cover the sun. In interior Brazil, where the eclipse will last longest, the sun will be covered for four minutes, nine seconds, which is unusually long, though considerably short of the 7½ minutes which an eclipse theoretically can last—but seldom does.

If the world were now at peace, there would probably be a dozen expeditions from various countries scattered along the eclipse track, with cameras and spectroscopes set up, ready to observe the things that can best be observed at a total eclipse. So far as is known now, only one expedition to the track is planned. That is from Mexico, where there has been a great revival of astronomical interest in the last few years. Astronomers are taking two big cameras and a number of smaller ones to a point

in Peru. Probably some astronomers in South America will see it.

Certainly it should not go unobserved. Since this war started, scientists both in China and in Russia, despite the presence within their borders of invading armies, took time to make observations of other total eclipses of the sun.

To a person in the eclipse track, the sun will be completely covered by the dark disk of the moon, and the sun's pearly corona will appear around it, perhaps along with some prominences, the red flame-like protuberances that appear from the sun's edge. Though they can be detected at other times with proper instruments, it is only at a total eclipse of the sun that the corona and prominences can be seen with the naked eye.

Partial Eclipse Areas

Over a large part of western Africa, most of South America, Central America and the southern part of the United States from Texas to Florida, there will be a partial eclipse. The moon in these regions will just partly cover the sun. The nearer an observer is to the path of totality, the greater will be the amount of the sun that is hidden. A partial eclipse, however, is of slight interest scientifically, for only where the eclipse is total can the corona and prominences be seen, or other useful observations be made.

With the coming of January those distant stars which make up the constella-

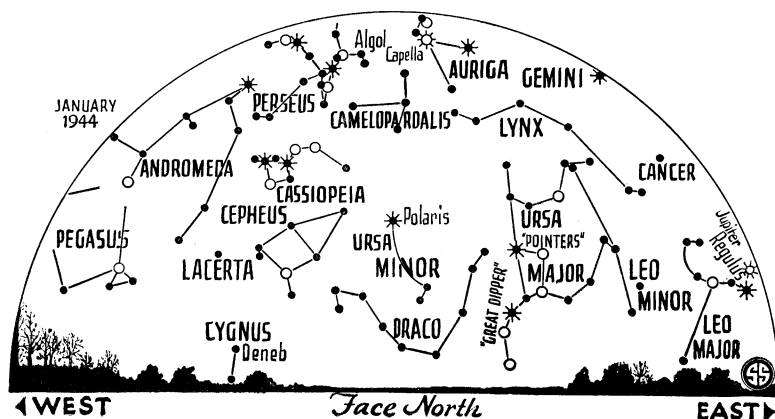
tions of Orion, Gemini, Canis Major, Taurus and their neighbors are seen in their full glory to the south in the evening. But January, 1944, will find this region even more brilliant than usual, for it has in it two bright planets—Mars and Saturn. In addition a third planet, Jupiter, which is even brighter, shines to the east close to another bright star.

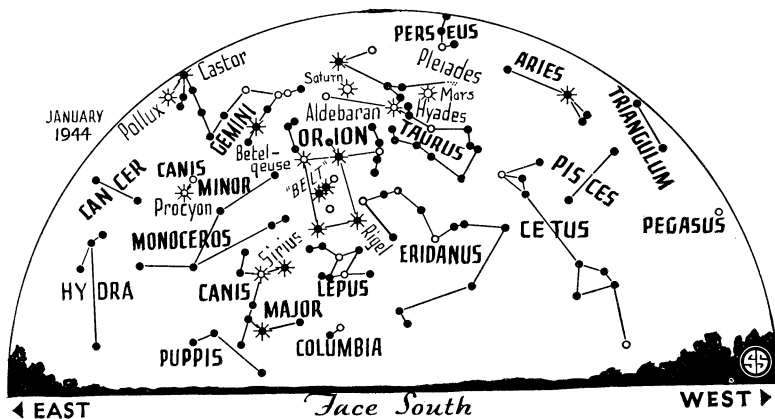
Look at Maps

Look at the accompanying maps. These depict the appearance of the heavens as seen at 11:00 p.m., your local war time, on Jan. 1, or at 10:00 p. m. in the middle of the month. In addition, of course, the moon swings across the heavens. It will be seen during most of the first half of the month, and the last few days as well. It always travels through the constellations of the zodiac, including Pisces, Aries, Taurus, Gemini, Cancer and Leo.

Of all the stars or planets indicated, Jupiter is the brightest, with magnitude minus 2 on the astronomical scale. Next in order of brightness is the star Sirius, the dog star, to the southeast in Canis Major, the great dog. Mars is next in order, then Saturn. Even through a telescope the stars appear as points of light, and their naked eye appearance, with the familiar "twinkling," makes them look very different from the planets, which have a more steady glow and shine by reflected sunlight.

Orion is a good group to locate first on these winter evenings, then from that you can find the rest. The three stars that form the warrior's belt are prominent in the south. Above them is Betelgeuse, and below is Rigel. A line from Sirius through the belt brings you close to Aldebaran, in





◊ * ◦ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Taurus, the bull, the group in which Saturn and Mars appear. Toward the southeast is Canis Minor, the lesser dog, with Procyon; while high in the east are Gemini, the twins, with Pollux, the brighter, and Castor. Low in the east just below Jupiter, is Regulus, in Leo, the lion.

Celestial Time Table for January

Jan.	EWT	
2	4:04 p. m.	Moon in first quarter.
3	12:54 a. m.	Algol at minimum.
4	2:00 p. m.	Earth nearest sun; distance 91,440,000 miles.

5	9:43 p. m.	Algol at minimum.
6	5:22 p. m.	Moon passes Mars.
7	11:47 p. m.	Moon passes Saturn.
8	6:32 p. m.	Algol at minimum.
10	6:09 a. m.	Full moon.
11	3:21 p. m.	Algol at minimum.
13	7:09 a. m.	Moon passes Jupiter.
	8:00 p. m.	Moon farthest: 252,170 miles.
18	11:32 a. m.	Moon in last quarter.
22	4:34 p. m.	Moon passes Venus.
23	2:37 a. m.	Algol at minimum.
25	11:24 a. m.	New moon—Total eclipse of sun, visible in South America and South Africa.
	11:26 p. m.	Algol at minimum.
26	7:00 a. m.	Moon nearest: 221,460 miles.
28	8:15 p. m.	Algol at minimum.
31	3:00 p. m.	Mercury farthest west of sun.
	5:04 p. m.	Algol at minimum.

Subtract one hour for CWT, two hours for MWT, and three for PWT.
Science News Letter, December 25, 1943

ASTRONOMY

Stellar Timekeepers

➤ PULSATING stars known as Cepheid variables are among the best timekeepers in the world. Particularly regular in their pulsations are the short-period or cluster-type Cepheids, which go through a complete expansion and contraction in about one-half a day. Their changes in size are observed by us as variations in the positions of the lines in their spectra, which are also accompanied by fluctuations in the brightnesses of these stars.

So regular are such stars, for instance, the one known as AR Herculis, a tenth-magnitude star in the constellation of Hercules, that Everett C. Yowell, of Columbia University, has been able to determine its period as 11 hours, 16 minutes and 51 seconds. This information he derived from examining Harvard plates of the region of the sky containing this star and extending from 1899 to 1925. But on plates from the latter time to 1941, the period of the star is found to be 11 hours, 16 minutes, and 49.6

seconds, or 1.4 seconds shorter than formerly.

Together with a change in the rate of its primary fluctuations, this celestial timepiece has revised its "secondary" period as well, as Mr. Yowell finds that

this, too, has changed, increasing by about three seconds in 1925.

What happens inside such a star to make it so suddenly start beating a new rhythm is not known, but it must be explained by some real physical change. Meanwhile, astronomers are searching for other stars whose periods have changed unexpectedly.

Science News Letter, December 25, 1943

ZOOLOGY

Scientific Essay Contest Has Reptiles as Subject

➤ UNUSUAL knowledge of reptiles may win some scientist \$60 and possibly \$100 in the 1944 contest for the Dr. William Johnson Walker prizes offered annually by the Boston Society of Natural History.

Science News Letter, December 25, 1943

AGRICULTURE

New Machine Uniformly Plants, Waters Seedlings

➤ A MACHINE that undertakes to eliminate back-breaking "stoop labor" in the fields is a mechanical transplanter on which patent No. 2,333,945 was granted to A. D. Mast and L. A. Furlow of Lancaster, Pa. Large cartons of seedlings of such plants as tobacco, tomato and cabbage are placed in big, box-like magazines. Padded mechanical fingers remove them one by one and transfer them to a grooved wheel or disk that sets them into the soil at a uniform depth. At the same time, a regulated quantity of water is delivered from a reservoir.

Science News Letter, December 25, 1943

The United States used 9,000,000 tons of commercial fertilizers in 1941.

ERRATA, Vol. 44, Nos. 1-26, July-December, 1943

PAGE	TITLE BEGINS	CORRECTIONS
23	Study Enemy Weapons	Col. 2, line 2, July-August for June 30.
28	"Short"	Col. 3, line 1, after corn crop insert not including corn fed to livestock on the farm.
82	Do You Know	Par. 3, line 3, Cymbopogon for Cymbogon.
192	Philosophy	Col. 3, line 7, peck for peak.
198	Degreasers Cause Death	Par. 3, line 1, Some for The; lines 7-8, incoordinately for individually instead of together; line 13, after is insert sometimes.
249	TB Protection	Par. 4, line 5, she for he.
304	Identification Marks	Line 8, ultraviolet ray for X-ray.
308	Prehistoric Baths	Throughout article, Hernandez de Alba for de Alba.
341	Salt Taken from Water	Col. 3, lines 10-11 to read, the chemical and absorbed salts were retained by a.