

ASTRONOMY

Lunar Eclipse

Although Not Quite Total, It Will Be So Near It That You May Not Notice the Difference; On October 27

By JAMES STOKLEY

MOST interesting of events scheduled in the heavens for the month of October, and visible from the United States, is an eclipse of the moon during the night of Friday, October 27. Though not actually total, it will be hard to tell that it is not. Reminding one of the purity of a certain brand of soap, it will be 99.2% total! That is, 99.2% of the diameter of the moon will be in the shadow of the earth, and the .8% remaining out will scarcely be noticed.

In Eastern Standard Time, the first noticeable effect will come about 11:54 p. m., when the northeastern edge of the moon touches the earth's shadow. At 1:36 a. m. the eclipse will be at its height, and the moon will have the red color of the light which is bent around the earth by its atmosphere and into the shadow. The eclipse will be over at 3:18 a. m., when the moon's western edge makes last contact with the shadow.

As in recent months, the planets are making a fine display, and they are indicated on the accompanying maps. Here the skies are shown as they appear at approximately 10:00 p. m. October 1, 9:00 p. m. on the 15th, and 8:00 p. m. on the 31st. Jupiter, high in the south, in Pisces, the fishes, is the most brilliant, of magnitude minus 2.4 in the astronomer's scale. Mars, lower and farther west, in the figure of Capricornus, the sea-goat, is red in color and considerably fainter, though it still exceeds in brilliance any of the stars. Saturn, toward the east, and also in Pisces, is faintest of the three. The other two planets that sometimes are visible to the unaided eye, Venus and Mercury, are both too close to the sun's direction to be visible.

Brightest Is Vega

Among the stars, which are distant suns, the brightest is Vega, toward the northwest, and marking Lyra, the lyre. Above is Cygnus, the swan, with Deneb. To the left, one sees Altair, of Aquila, the eagle. High in the south are the four stars of the "Great Square of Pegasus," so called despite the fact that the one in the upper left, Alpheratz, is in the con-

stellation of Andromeda. Low in the south is Fomalhaut, in Piscis Austrinus, the southern fish, one of the most southerly bright stars visible from these latitudes.

To the northeast we see two of the bright stars which will shine prominently in the southern sky of winter. These are Capella, in Auriga, the charioteer, and Aldebaran, of Taurus, the bull. The "Great Dipper," of Ursa Major, the great bear, is low in the north, its poorest position of the year, but higher is the W-shaped group of Cassiopeia, the queen, now in a very good position. This is above Polaris the pole star. To the left of Ursa Minor, the little bear, of which the pole star is part, winds the fainter constellation of Draco, the dragon.

Solar Eclipse, Too

The moon eclipse on October 27 is not the only eclipse of the month, but it is the only one that will be observed by very many people. On October 12 the moon's shadow will sweep across the earth, producing a total eclipse of the sun. For about a minute and a half, at the maximum, the sun will be hidden. Astronomers often make trips of thousands of miles to see such an eclipse, but in this case they would have to be Antarctic explorers as well, for the path over which the total eclipse will appear passes over Antarctica, close to the South Pole. Even there it is low in the sky, and probably no human being will see it.

Over a larger area, however, the eclipse will be partial, with the dark lunar disc partly hiding the sun. The area where this will happen includes the southern tip of South America, New Zealand, and a large part of the southern Pacific Ocean.

An eclipse of the sun is only visible as total over the narrow area touched by the moon's tapering shadow, but one of the moon can be seen wherever the moon is in the sky during the phenomenon, including more than half of the earth.

Begins in Europe

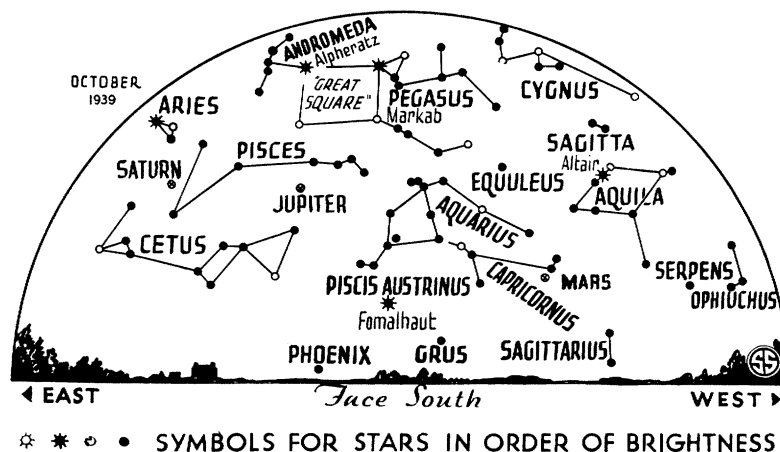
The beginning of the eclipse on the 27th will be viewed in most of Europe, except the most eastern part, in western Africa, the Atlantic Ocean, North and South America, the eastern part of the Pacific Ocean, and northeastern Siberia.

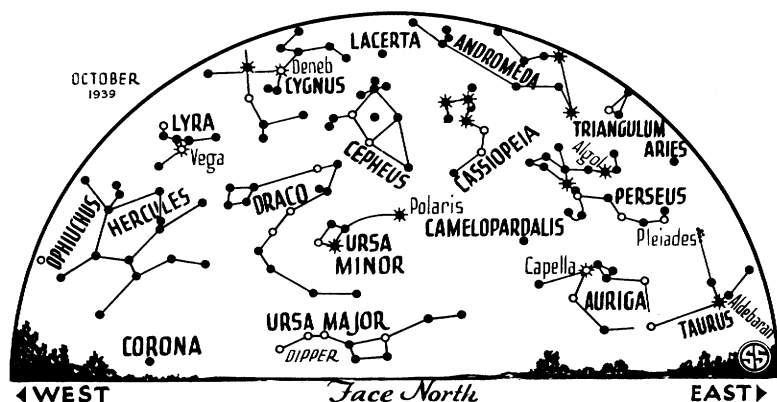
By the time the eclipse is ending, the earth will have turned, and it will then be apparent over the North Atlantic and Arctic Oceans, North and South America, the Pacific Ocean, Polynesia, the eastern part of Australia and northeastern Asia.

This is the only eclipse of the moon visible this year in the United States, though there was one on May 3 seen from Asia, Africa and part of Europe.

Compared to an eclipse of the sun, one of the moon is relatively unimportant from a scientific viewpoint, though it has some useful aspects. For one thing, it permits a more accurate check of the moon's position in the sky.

Because it is affected by the gravitational pull not only of the earth, but of all the other bodies in the solar sys-





tem, the precise prediction of the moon's motion is a very complicated problem. Therefore it has to be checked by occultations, that is, the hiding by the moon of stars in the distant background. Their position is well determined, the time of an occultation can be predicted, and if it does not happen on schedule, the difference, always very small, is a result of inaccuracy of the moon's own motion.

The moon cannot be eclipsed unless it is on the side of the earth away from the sun, that is at full moon, for that is the direction in which the earth's shadow extends. Ordinarily at full moon, our satellite is so brilliant that it is difficult to observe these occultations, especially of fainter stars, but the eclipse dims it so much that they can then be made.

A lunar eclipse is very interesting to watch, especially as the curved shadow of the earth crosses the moon's surface. This, incidentally, is an excellent proof of the roundness of the earth, and was so recognized in early days. The shadow is always the arc of a circle. Nothing but a sphere, of course, can always cast a round shadow.

The red color of the eclipsed moon is

caused by the refraction, or bending, of the light of the sun by our atmosphere. Without it, the shadow would be sharply defined, but with it, the sunlight that grazes the earth is bent into the shadow and falls upon the moon, even when fully shaded. As this light passes through the air, blue rays are scattered, and this gives the daytime sky its blue color. Deprived of the blue, the light that emerges is predominantly red, and the moon, in eclipse, takes on a ruddy, coppery color that used to strike terror into the hearts of primitive men when they saw it.

Celestial Time Table for October

Friday, Oct. 6, 12:27 a. m., Moon at last quarter. **Tuesday, Oct. 10,** 8:00 p. m., Moon nearest earth — 224,700 miles. **Thursday, Oct. 12,** Total eclipse of sun; 3:30 p. m., New moon. **Thursday, Oct. 19,** 10:24 p. m., Moon at first quarter; Orionid meteors. **Saturday, Oct. 21,** 1:09 p. m., Moon passes Mars; 10:00 p. m., Saturn nearest earth—distance 771,900,000 miles. **Sunday, Oct. 22,** 6:00 p. m., Moon farthest from earth—distance 251,600 miles. **Wednesday, Oct. 25,** 11:42 a. m., Moon passes Jupiter. **Friday, Oct. 27,** 3:09 p. m., Moon passes Saturn. **Saturday, Oct. 28,** Early morn., Eclipse of moon; 1:42 a. m., Full moon.

Eastern Standard Time throughout.

Science News Letter, September 30, 1939

GEOGRAPHY

Rumania Has Grain, Wood, Richest Oil Fields in Europe

RUMANIA, mentioned as "next" for the Nazi razor of conquest, would be an especially juicy bit from the German point of view. Not only does the country contain the richest oil fields in Europe and some of the greatest grain and timber production areas, but within its present boundaries are three big blocks of real estate that might be used as bribes for the winning of three nations

as yet in the neutral list but commonly credited with leanings in the Nazi direction.

First and largest is Transylvania, comprising something like a third of Rumania's total area. Before the First World War it was part of Hungary, its boundary running along the crest of the Transylvanian Alps which now form the backbone of the Rumanian kingdom.

Transfer of this rough and mountainous province to Rumania by postwar treaty cut Hungary in half and swelled the shape of Rumania from a prewar kidney-bean to a postwar round cookie. Hungary has been very sore about the loss of Transylvania and probably could be easily induced to join the Nazis if return of this lost province were held out as an inducement.

Second possible bribe-slice would be Bessarabia, a wedge-shaped stretch of lowland between the Pruth and the Dniester rivers, its coastline coming down to the mouths of the Danube. Rumania took this away from Russia during the latter country's period of revolutionary disorganization. Russia would undoubtedly be glad to get Bessarabia back again, along with the formerly Russian parts of Poland.

Bulgaria Hopes

Finally, there is the stretch of coastal land south of the mouths of the Danube, known as the Dobrudja. This was part of Rumania before the First World War, but Bulgaria has always had a covetous eye on the province. Hope of getting it was one of the considerations that brought Bulgaria in on the side of Imperial Germany, and the same hope might bring her in again as an ally of Nazi Germany.

A military venture against Rumania would be psychologically easy to "sell" to the Germans. Rumanian troops have always been regarded as "soft"; and it is true that when Rumania entered the First World War on the side of the Allies she was promptly knocked out in one sweeping campaign under the ruthless Mackensen.

They might be disappointed in one respect, however. Undoubtedly, the hope of getting full command of Rumanian oil would be a prime motive for a German invasion. However, it is known that the present leaders in Rumania, who were young soldiers when their country had to suffer humiliating defeat twenty years ago, would ruin their oil wells with dynamite and fire rather than see them fall into the hands of a hated enemy.

Science News Letter, September 30, 1939

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenter:

Friday, Sept. 22, 4:27.4 p. m., EST

Near eastern coast of Lower California. Latitude 30 degrees north, longitude 114 degrees west. Rather sharp shock.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL, June 17.