

## ASTRONOMY

# Saturn in Southern Sky

One of the longest total eclipses ever seen will occur in June but it will not be seen in the United States. Stars of early summer shine brightly.

By JAMES STOKLEY

► IN THE history of astronomy, the month of June, 1955, will doubtless be recorded for one of the longest total eclipses of the sun ever observed.

With many eclipses, which astronomers make great efforts to observe, the sun is hidden behind the moon for only two or three minutes. This one, on June 20, will last for as much as seven minutes, eight seconds. One of the best places to see it will be in the Philippines, and many astronomical expeditions have already set their instruments at points of vantage.

Unfortunately, all of this occurs while the sun is below the horizon for the entire Western Hemisphere, so nothing will be observed in the United States and Canada.

We will, however, see the fine display of early summer stars that June evenings bring, with the planet Saturn shining brightly in the south. Jupiter is also visible low in the west just after sunset.

These are shown on the accompanying maps, which depict the heavens as they look about ten o'clock, your own kind of standard time, at the beginning of June, and an hour earlier at the middle of the month.

## Saturn in Libra

Saturn is seen in the constellation of Libra, the scales, about half way between two bright stars: Antares, in Scorpius, the scorpion, and Spica, in Virgo, the virgin. Saturn is a little brighter than either of the stars, but not as bright as Vega, in Lyra, the lyre, high in the east.

Just below Vega is the Northern Cross, part of Cygnus, the swan, in which is the star Deneb. To the right can be seen Altair, in Aquila, the eagle.

Second brightest of the stars now visible is Arcturus, in Bootes, the bear-driver, high in the south, above Virgo. Somewhat fainter, although still rating as first magnitude on the astronomical brightness scale, is Regulus, in Leo, the lion, seen in the west above Jupiter.

To the right of Jupiter we find Pollux, in Gemini, the twins. This star also is of first magnitude, but because it is now so close to the horizon, much of its light is absorbed by our atmosphere, which makes it look much fainter than if it were seen high in the sky.

The same is true to an even greater extent for Capella, in Auriga, the charioteer, which is shown still farther to the right,

practically on the horizon. Now it gives but a slight intimation of its brilliance on winter evenings, when we can see it directly overhead.

The planet Mars, far away and faint, of the second magnitude, is also in Gemini, the twins, but below the horizon for the times of the maps. Venus is now a morning star, visible low in the east just before sunrise.

Mercury cannot be seen at all in June. On the 16th it swings between the sun and earth, reaching the position called inferior conjunction.

The eclipse on June 20, local time, is the first of three this year, of which two are eclipses of the sun and one of the moon. A solar eclipse occurs when the moon comes between sun and earth; while one of the moon happens when the earth comes between that body and the sun, thereby cutting off its illumination.

It so happens that the average distance of the sun (about 93,000,000 miles) is about as many times farther than the moon (240,000 miles) as the sun is bigger than the moon. Thus, as we see them in the sky, they appear approximately the same size. The distances of both these bodies vary.

The sun, for example, is about 3,000,000 miles closer in January than in July; while the moon's distance may be as little as 222,000 miles, or as much as 252,000 miles. Both, of course, change in apparent size with distance, appearing largest when closest.

If a solar eclipse occurs when the moon is farthest—and smallest—at the same time that the sun is nearest—and largest—the former is so small that it fails by far to cover up the solar disc. Instead, a ring of light appears around the dark moon, and this is called an annular eclipse. One of

these will occur Dec. 14, visible in the region of the Indian Ocean.

On the other hand, if the eclipse happens when the sun is farthest and the moon nearest, it will be total, and the sun will be covered for a relatively long time. Also, the place on the earth where it is visible has an effect.

If one sees it from the tropical regions, so that the sun is directly overhead at eclipse time, the observer is a little closer on account of the bulge caused by the earth's curvature, and the moon seems still bigger.

The sun is farthest from the earth about July 4. If an eclipse occurred then, with the moon at perigee (nearest the earth) and it were visible from a point in the tropics with the sun at the zenith, we would have the longest possible total eclipse, lasting about seven and a half minutes.

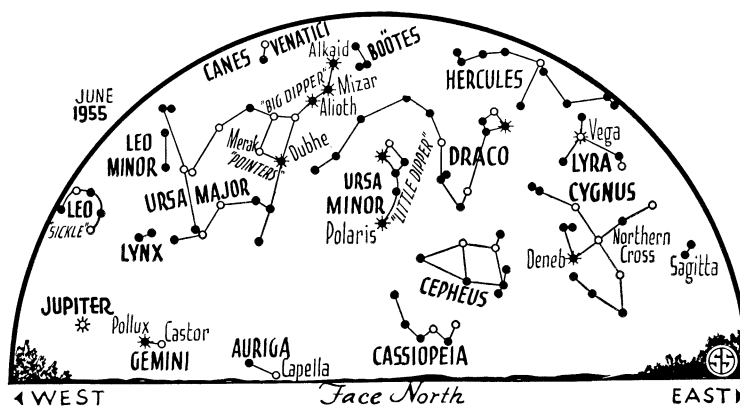
## Longest Eclipses

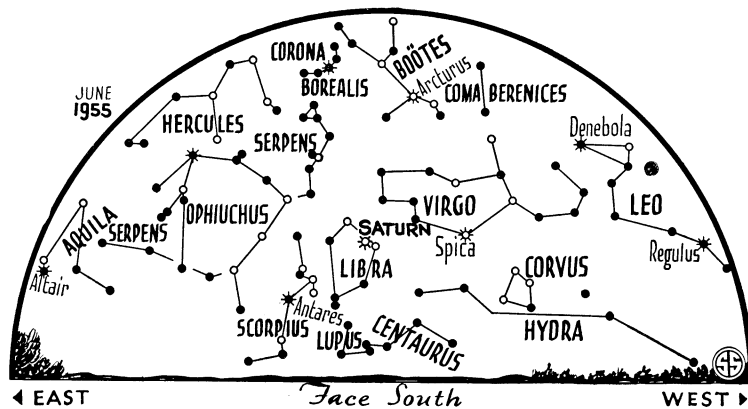
Probably this exact combination of circumstances has never occurred. Even as close an approximation to them as to give a totality of as much as seven minutes is exceedingly rare. It happened June 8, 699 A.D., with an eclipse track that passed across Brazil, which was probably not seen by any astronomers!

It happened again on June 13, 717, when the eclipse was just one second shorter than that in 699, 15 seconds over seven minutes instead of 16 seconds. Skimming into the rare, over seven-minute class was the eclipse of June 25, 735 A.D., which lasted seven minutes and one second, passing over the Indian Ocean and northern Australia.

Not until 1937, was there another eclipse longer than seven minutes. That was on June 8, 1937, when the sun was hidden for seven minutes, four seconds, the eclipse track traversing the Pacific Ocean.

Unfortunately, there was no land at the middle of the path, where it lasted for the maximum time. Some astronomical groups went to Canton Island, at the western end of the path, where the duration was about three minutes, and others to Peru, at the





\* \* ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

eastern end, where the total phase was still shorter.

However, two astronomers, Dr. John Q. Stewart of Princeton, N. J., and the writer, were close to the middle of the path, on board the S.S. Steelmaker, en route from Hawaii to Panama, and there we saw it last for seven minutes six seconds, setting a record for the duration of totality observed. The extra two seconds was picked up due to the ship's motion.

After an interval of a little over 18 years, called a Saros, an eclipse repeats itself, either north or south of its previous track, and about a third of the earth's circumference to the west. Thus this June's eclipse is the repetition of the one that Stewart and I saw from Mid-Pacific in 1937, and this time there is land where totality lasts for seven minutes near Manila in the Philippines.

The actual point of longest duration is farther west, in the South China Sea. Viet Nam and Thailand will also see it, but for a little less than seven minutes.

The path of totality, over which the total eclipse may be seen, starts, as the sun rises, in the western Indian Ocean, off the coast of Somaliland. It is more than a hundred miles wide and goes northeast, crossing Ceylon and the Bay of Bengal before it reaches the Indo-China peninsula. Then it goes eastward, across the South China Sea and the Philippine island of Luzon, before it curves to the southeast. It leaves earth a little north of the Fiji Islands, as the sun is setting there.

Along this path, wherever it is clear, all the magnificent phenomena of a total eclipse of the sun will be seen.

As the moon completely covers the disc of the sun, the solar corona will flash into view. Only at the time of a total eclipse can this been seen at all with the naked eye, or observed in its entirety even with instruments. Over a larger area, covering most of southern Asia, northern Australia and the islands to the north, there will be a partial eclipse.

**Celestial Time Table for June**

June	EST	
3	3:40 a.m.	Moon passes Saturn.
4	10:00 p.m.	Moon farthest, distance 252,400 miles.

5	9:08 a.m.	Full moon.
13	7:37 a.m.	Moon in last quarter.
16	1:00 a.m.	Mercury between sun and earth.
18	1:51 p.m.	Moon passes Venus.
19	9:00 a.m.	Moon nearest, distance 222,400 miles.
	11:12 p.m.	New moon, total eclipse of sun visible in Asia.
21	6:23 a.m.	Moon passes Mars.
	11:32 p.m.	Sun farthest north, beginning of summer in Northern Hemisphere.
22	7:07 a.m.	Moon passes Jupiter.
30	7:16 a.m.	Moon passes Saturn.

Subtract one hour for CST, two hours for MST, and three for PST.  
 Science News Letter, May 28, 1955

**PSYCHOLOGY**

**Negro Babies Aware of Race Differences at Two**

➤ EVEN AT the early age of two years, Negro children have become aware of their difference from whites and their behavior on tests is affected by this awareness.

This early consciousness of race was revealed in the course of repeated testing of Negro babies to compare their development with that of white infants.

The testing of Negro babies was done by a white examiner in New Haven. The babies belonged to a low socioeconomic group. Results were reported by Drs. Benjamin Pasamanick and Hilda Knobloch of the Johns Hopkins University, Baltimore, Md., in the *Journal of Abnormal and Social Psychology* (May).

No significant differences in either physical growth or behavior development were revealed by the tests of Negro and white babies during the first 18 months.

In the tests given at two years, a difference did show up. Although in general the growth of the Negro babies continued at the same rate as for whites, their language development dropped down.

They were not retarded as compared to the performance of white babies, but development in this field was slower than in other fields of behavior or motor achievement.

Analysis pinned the slowing down to the field of verbal responsiveness. The mother of one Negro child provided a clue to the

discrepancy, explaining it was the examiner's white skin that kept the child silent. The mother's explanation was supported by the fact that the children scored high enough on the understanding of speech.

"The awareness of racial differences apparently occurs much earlier than has been previously demonstrated," the scientists conclude. This awareness plays an important part in affecting mental test scores and should be considered in making any interpretations of racial differences.

Science News Letter, May 28, 1955

**ENTOMOLOGY**

**Cockroach Survives by Adapting to Temperature**

➤ AS ANY householder knows, the cockroach is one of the peskiest little critters to eliminate.

Cockroaches, particularly the young ones, adapt readily to temperature changes, Dr. Paul Dehnel and Dr. Earl Segal, zoologists of the University of California at Los Angeles, have found.

That may be why they are hard to eliminate.

The researchers experimented with cockroaches that had led a sheltered life. The insects had been kept at a constant temperature of 80 degrees Fahrenheit for three generations.

Then by subjecting the roaches to various temperatures somewhat lower than 80 degrees for a week and measuring their oxygen consumption, the investigators were able to tell how the insects step up their life processes to compensate for environmental changes.

They found that the nymphs or young cockroaches adapt readily to such changes. Adults were somewhat slower. Roaches are in the nymph stage for three or four years and may survive two additional years as adults.

This compensatory mechanism in the young may be a factor that enables roaches to survive in such large numbers under all sorts of conditions the world over. It has generally been thought that insects are relatively lacking in ability to compensate for such temperature changes.

Science News Letter, May 28, 1955

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