

ASTRONOMY

Saturn Is Coming Closest

Only planet to appear in the skies in January, ringed planet shines brightly. Stars of Orion are prominent high in the south. Moon to be in conjunction with Saturn on Jan. 8.

By JAMES STOKLEY

► **THOUGH ONLY** one planet appears in the evening skies of January, that one—Saturn—has joined the brilliant group of stars in the south and southeast, to make them even more conspicuous. Probably the most familiar of these are the orbs that make up the figure of Orion, the warrior, high in the south, as indicated on the accompanying maps. These depict the appearance of the heavens at 10:00 p.m. around Jan. 1, about 9:00 p.m. in the middle of the month, and an hour earlier at the end.

Orion is easily identified because of the three stars in a row that form the warrior's belt. Above and to the left is Betelgeuse, below and to the right is Rigel, both part of the same group. But above and to the right is another constellation, that of Taurus, the bull, with first magnitude Aldebaran, red in color. Below and to the left of Orion is Canis Major, the great dog, with Sirius, the dog star—brightest star that we can see in the nighttime sky.

Gemini, the Twins

If, starting with Orion's belt, we continue on past Betelgeuse, we come to the constellation of Gemini, the twins, in which shine Castor and Pollux. Below these stars, which, to the Romans, represented two of their favorite gods, is Cancer, the Crab. Like the Gemini, Cancer is a constellation of the zodiac, the series of star groups through which move sun, moon and planets. And that is why at the present time we see Saturn in Cancer, making conspicuous a rather faint constellation. Saturn is now of about zero magnitude on the astronomer's scale, so it is brighter than any of the stars now visible, with the exception of Sirius. In January Saturn and the earth are both in the same direction from the sun, so the two planets are closest—a mere 754,984,000 miles—which partly accounts for the brilliance of the planet. Also, though they are not visible to the naked eye, Saturn's famous system of rings is now pretty well spread out, so that the sun-

light they reflect to us contributes to the overall brightness. Sometimes, when the rings are on edge as we see them, the brightness is much less.

Between Cancer and Orion there is another bright star to be seen. This is Procyon, in Canis Minor, the lesser dog. Another first magnitude star is overhead, in the figure of Auriga, the charioteer. This is named Capella. And there is still another over toward the east—Regulus, in Leo, the lion. At the low height shown, however, it does not shine with its full brightness. Later at night, as it rises higher, it looks brighter.

Two Other Planets

Two other planets can be seen in January if you want to keep late hours. Jupiter, which is nearly as bright as Sirius, in the constellation of Scorpius, the scorpion, just now can be seen low in the southeast about 4:00 a.m. Venus, which is many times brighter still, is in the same constellation and comes up a little later so that both Jupiter and Venus shine gorgeously in the southeastern sky before sunrise. Mercury and Mars cannot be seen this month, as both are on the far side of the sun.

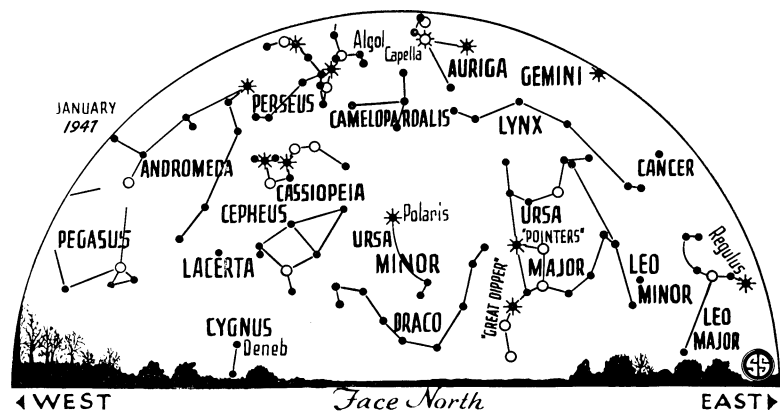
As the moon travels around the sky every month, going through its changing phases, it regularly passes the planets, which move more slowly along a similar path. When this happens we call it a

conjunction of the moon and the planet. Thus on Jan. 8 at 7:18 a.m., when we cannot see them, the moon is in conjunction with Saturn. On the night of the seventh the moon appears to the west of the planet, and the following evening we see it to the east. When they are closest, the moon appears about six times its own diameter from Saturn.

Occultation

Sometimes, however, the moon comes squarely in front of a planet or a star. On Jan. 16, when the moon is in conjunction with Jupiter, this happens, and the event is termed an occultation. It is really a kind of eclipse, though that name is usually reserved for an occultation of the sun by the moon, or a passage of the moon into the shadow of the earth.

Jupiter's occultation happens, unfortunately, at an inconvenient time for much of the country. People in the east will be able to observe it only during daylight hours. At Washington the moon, moving eastward, will occult the planet at 7:55 a.m., EST. As the moon will then be a few days past last quarter, the illuminated part will be to the east, and this edge will be the one that covers the planet. At 9:06 a.m. Jupiter will reappear, from behind the dark edge of the moon. Since this will happen in full light, it will be hard to see with the naked eye, but a pair of binoculars or a small telescope will help. The Nautical Almanac Office of the U. S. Naval Observatory, which calculates these times, also computes them for three other places in the nation, one of which is in western Massachusetts, near Pittsfield. Here



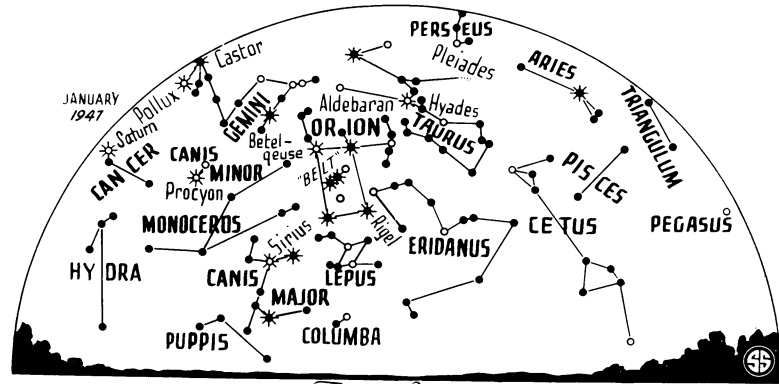
Do You Know?

Most green plants retain their carotene, from which the body makes vitamin A, hidden in their leaves, but some transfer part of it to their roots which become yellow vegetables such as carrots.

Worsted and woollens differ in the type of wool fibers used; worsteds are made from tops, the longer fibers combed out of new, or virgin wool, while woollens are made from whole wool or the short fibers.

The dark spaces in the Milky Way, once referred to as coal sacks, are now known to be vast clouds of cosmic matter, dust and gas, cutting off our view of star masses beyond them.

Rice growing in the Orient depends largely on hand labor; in the United States rice is seeded from airplanes flying over the rice fields, harvested by the combine-drier method, and handled by machinery.



◀ EAST Face South WEST ▶
 ☆ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

the planet is hidden at 8:11 a.m., EST, and it comes out again at 9:02.

Farther west the occultation occurs a little sooner, and with the time being earlier conditions are better. For a point in central Illinois, near Quincy, the planet is occulted at 6:02 a.m., CST, before sunrise, and returns to view at 7:44. In the far west it is still better. For the fourth point for which the Naval Observatory makes predictions, a spot in southern California near Bakersfield, the occultation begins at 3:57 a.m., PST, and ends at 4:51, so it will be entirely in the dark.

Celestial Time Table for January

Jan.	EST	
3	9:00 a.m.	Earth nearest sun, 91,468,000 miles
6	3:00 a.m.	Mars behind sun
	9:00 a.m.	Moon nearest, 222,000 miles
	11:47 p.m.	Full moon
8	7:18 a.m.	Moon passes Saturn
13	9:56 p.m.	Moon in last quarter
16	8:25 a.m.	Moon passes (and occults) Saturn
17	10:04 p.m.	Moon passes Venus
18	midnight	Moon farthest, 252,300 miles
22	3:34 a.m.	New moon
23	4:00 a.m.	Mercury behind sun
26	1:00 a.m.	Saturn nearest, 754,984,000 miles
27	10:00 p.m.	Venus farthest west of sun
29	7:07 p.m.	Moon in first quarter

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, December 28, 1946



Photo courtesy Haverford College

RESISTANCE BOXES FOR STUDENT USE

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NUCLEAR PHYSICS

World Union Hastened

► WORLD UNION has been made more likely because of the advent of atomic power, declares Dr. Vannevar Bush in his annual report as president of the Carnegie Institution of Washington. Admitting that many persons see such a union as a "Roman peace" imposed by the atomic-armed strongest nation on all the rest, he points out that "there is a large and salutary endeavor for a better result—effort for a voluntary joining of states under some scheme of guarantees that will protect minorities.

Nor does he overlook the possibility that a world ethically unready for the yielding of such power may destroy itself before a satisfactory union can be effected. But, he adds, "it is doubtful whether civilization will commit suicide knowing it is doing so, and because of science the race between the power of weapons and the power of understanding is not altogether one-sided."

Popular recognition of the tremendous power of science, intensified by its war-

time accomplishments, will bring about strong material support of research in the near future, Dr. Bush is confident. He sees, however, some hazards that must be guarded against. Among them are a too-urgent demand for immediate application, possibility of dictation to science by laymen, over-emphasis on military aspects, and indifference to or ignorance of the cultural and philosophical significance of science.

So far as the Carnegie Institution is concerned, he pledges, "It should and will firmly support fundamental science if there should be a tendency toward the over-applied . . . It will most decidedly emphasize that the pursuit of science for its cultural value remains a thing worthy of men's best effort."

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After a careful study a statistician estimates that this year four out of every five tourists travel by highway.