ASTRONOMY

Jupiter Shines in East

Joins Mars and Saturn and bright December stars, making evening sky a brilliant display. Saturn's rings now at angle to the earth.

By JAMES STOKLEY

➤ WHEN DECEMBER evenings arrive, we begin to see the brilliant stellar display of winter, for then the part of the sky that is visible before we go to bed includes more of the brightest stars than any other region. And this month their glory is enhanced by the addition of three planets, each one of which is nearly at its maximum brightness. On the accompanying maps these stars and planets are indicated as they are arranged at about 11:00 p.m. at the beginning of December, or about 10:00 p.m. in the middle of the month.

To the east, especially the southeast, is the best collection of shining orbs. The brightest object is the red planet Mars, now but a little more than 50,000,000 miles away, which is closer than it will be for some years to come. It stands in the constellation of Taurus, the bull, in which you can see the star Aldebaran, supposed to be the bull's eye. Also in Taurus, fainter than Mars, but considerably more brilliant than Aldebaran, is the planet Saturn.

Below Taurus is the splendid constellation of Orion, representing a warrior with upraised club which he uses to threaten the charging bull. Three stars in a nearly vertical row form his belt. Just to the north is Betelgeuse, in one of his shoulders, while to the south is Rigel, in his lifted foot. And below Orion is Canis Major, the great dog. The conspicuous star in this figure is Sirius, known also as the dog star. This is of interest because it is the brightest star in the whole night sky. Its magnitude, in the astronomer's scale, is minus 1.6, just slightly fainter than Mars is at present.

One of Closest Stars

Also it is one of the closest stars that we can see from the northern hemisphere, which is the reason for its brilliance. Its distance is 51,087,200,000,000 miles. But that is rather an awkward figure to handle, so its distance is often expressed as 8.7 light years, a light year (about 6,000,000,000,000 miles) being the distance that a beam of light will travel in a year.

To the left of Canis Major is the lesser dog, Canis Minor, with another bright star, called Procyon. And to the left of this group, and a little higher, are Gemini, the twins, whose names are Castor and Pollux. Directly below Gemini is the faint group of Cancer, the crab, no stars of which are shown on the maps, and below that is Leo, the lion, which rises into good view just after the times for which the maps are drawn. Jupiter, our third bright planet, is entering into this part of the sky, and just manages to get on the maps, close to the horizon. Though just now it is really brighter than Mars, it will not seem so when it is so low, because the earth's atmosphere absorbs much of the light. Later in the night, as it rises higher, it will be seen in greater splendor. This month it is close to the star Regulus.

Mercury Appears Briefly

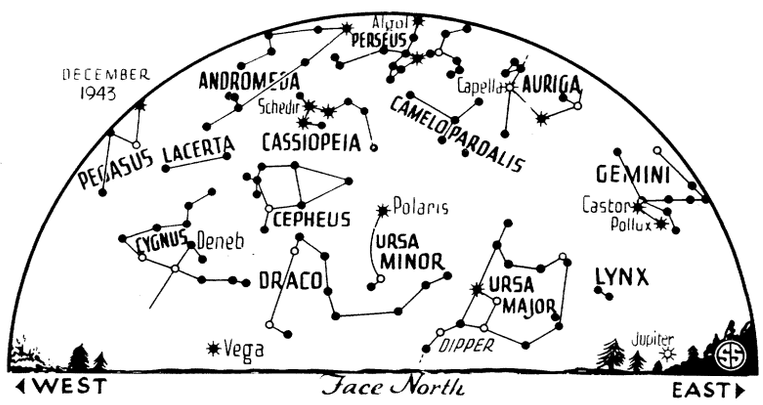
As for the other two naked eye planets this month, Mercury also puts in a brief appearance around the 22nd. On that date, which also happens to be that of the beginning of winter, Mercury is farthest east of the sun. It will set in the west about an hour and twenty minutes after the sun, so it may be glimpsed with difficulty in the twilight. Venus rises in the east about 4:00 a.m. In the constellation of Libra, the scales, it is so brilliant, exceeding even Mars or Jupiter by about 6 1/3 times, that one would have no trouble in locating it.

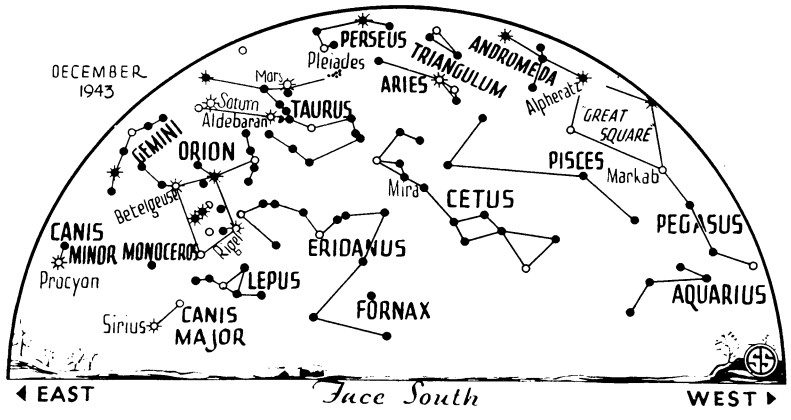
Shown nearly overhead on the December maps is the constellation of Perseus, and in it is a star named Algol. This is from an Arabic word, "al ghul," which means "the demon," and if you look at this star on the evenings of Dec. 13 or 16, you may understand why it was given this unsavory title. On most nights when you look at it, you will find it considerably brighter than the star just to the south of it—rho Persei. But if you look at it on Dec. 13, about 11:10 p.m., EWT, or on the 16th about 7:59 p.m., EWT, you will find that it is approximately the same as rho Persei in magnitude.

Brightness Wanes

Astronomers have long studied it, and they find that normally its magnitude is 2.2. For about 2 days 11 hours the star remains close to its normal state. Then, in about 5 hours, it drops to a third of its usual brightness; in another 5 hours it gradually resumes it again. As long ago as 1782 an English astronomer named Goodricke proposed that the star consisted of a bright and a faint member, revolving around each other so that every few days the dark body partially eclipsed the bright one. No telescope is powerful enough to show these two bodies, but it has been amply proved that this idea is correct. In fact, there is even a third body whose presence has been detected.

Modern researches, some of which have used an electric eye for accurate measurement of the brightness, have indicated that there is a slight diminution in brilliance as the bright star passes in front of the darker one, and this shows that the latter is not entirely dark. The bright star is about 27 times as big as our sun and the companion is still





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

bigger, though only about a fifteenth as bright. The distance between the centers of the two stars is about 13,000,000 miles and the distance of the pair from us is approximately 125 light years. Several hundred of these eclipsing binary stars are known. Their periods vary upward from a few hours, where the two spheres are almost in contact. Others take several months for the change, and one, epsilon Aurigae, is eclipsed every 27 years, the reduction in light lasting for two years. Saturn, which is now so bright in the constellation of Taurus, is always a most interesting object through a telescope big enough to reveal its curious system of rings. Actually this is not a solid ring —many years ago it was shown that no solid ring, even if made of the strongest materials conceivable, would be able to withstand the strains to which it would be subjected. Instead, it is made up of a swarm of tiny moons, perhaps no larger than good-sized rocks on earth. There are so many millions and millions of them that from this distance they look continuous. The ring system is about 41,500 miles wide and 171,000 miles in outside diameter, while there is a space of 7,000 miles between the inner part and the surface of Saturn. The system is only about ten miles thick. In July, 1936, when the earth was exactly in the plane of the rings, they disappeared from view, even through big telescopes.

But since then they have been opening out, as the earth has moved farther and farther away from their plane. This month they are spread out the most, and there is an angle of nearly 27 degrees between their plane and the line to us. In 1951 they will again be on edge, and after that the other side will be presented to our view. The complete cycle takes 29 1/2 years, which is the time it takes Saturn to revolve around the sun.

CELESTIAL TIME TABLE
December, 1943

Dec.	EWT	
1	6:00 a. m.	Moon nearest, distance 228,-600 miles
4	7:03 a. m.	Moon in first quarter.
5	2:00 p. m.	Earth directly between sun and Mars.
8	5:32 a. m.	Algol at minimum.
10	7:43 p. m.	Moon passes Mars.
11	2:21 a. m.	Algol at minimum.
	12:24 p. m.	Full moon.
	9:07 p. m.	Moon passes Saturn.
12	early a. m.	Meteors of Geminid shower.
13	11:10 p. m.	Algol at minimum.
15	8:00 p. m.	Saturn nearest, distance 748,-000,000 miles.
16	7:59 p. m.	Algol at minimum.
17	2:44 a. m.	Moon passes Jupiter.
	3:00 a. m.	Moon farthest, distance 251,-600 miles.
19	4:03 p. m.	Moon at last quarter.
	4:48 p. m.	Algol at minumum
22	1:30 p. m.	Winter solstice, winter commences.
	10:00 p. m.	Mercury farthest east of sun.
23	2:46 p. m.	Moon passes Venus.
26	11:50 p. m.	New moon.
28	10:00 p. m.	Moon nearest, distance 225,-100 miles.
31	4:05 a. m.	Algol at minimum.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, November 27, 1943

MEDICINE

Safer Gold Salts Found For Treating Arthritis

➤ DISCOVERIES that may lead to greater safety in the use of gold salts for treating arthritis and some other diseases are announced by Dr. A. K. Anderson and Dr. Charles W. Denko of Pennsylvania State College.

New, non-poisonous gold compounds, called auroxanthates, have been developed by these scientists. The auroxanthates when injected into rats build up the resistance of the animals to later injections of the toxic gold compounds. Whether the auroxanthates themselves have curative properties has not yet been determined.

The second discovery is that before the rats die from the effects of the toxic compounds, their blood gives a danger warning by an increase in non-protein nitrogen content even when no visible damage to the kidneys can be detected.

Science News Letter, November 27, 1943

MEDICINE

Scientists Asked Who Should Get Mayer Award

➤ SCIENTISTS are being asked to recommend persons who may be eligible for the 1943 Charles L. Mayer award of $2,000.

The award is offered for the most outstanding contribution made during 1943 to present-day knowledge of factors affecting the growth of animal cells, with particular reference to human cancer. The National Science Fund of the National Academy of Sciences administers the award.

Manuscripts and articles published during 1943 may be submitted to the committee any time before the middle of January, 1944.

Last year's award, the first to be given, was made to Dr. Charles Huggins of the University of Chicago for his work on endocrine control of prostatic cancer.

Science News Letter, November 27, 1943