

ASTRONOMY

Winter Arrives

With the coming of cold weather, the evening skies contain bright array of constellations surrounding Orion, the warrior. Brightest are Sirius and Procyon.

By JAMES STOKLEY

► WITH the arrival of December we approach the formal beginning of winter, which occurs this year on Dec. 22 at 5:14 a.m., EST. This is the moment of the winter solstice when the sun, which has been moving through the sky in a southerly direction since June, reaches its southernmost point. Then it starts northward again—with its promises of another spring and summer.

In the evening skies, too, the coming of winter is reflected with the appearance in the east of that bright array of constellations surrounding the figure of Orion, the warrior. These are shown on the accompanying maps, which give the appearance of the skies at about 10:00 p.m., your own kind of standard time, on Dec. 1; 9:00 p.m. at the middle of the month; and 8:00 p.m. as January arrives.

Southeastern Sky Crowded

Only a glance at the map of the southern half of the sky reveals that the left-hand side seems quite crowded compared to the region to the right. And this is no illusion, for the southeastern part of the December sky does contain an unusually large number of bright stars. In this area, for example, shown near the horizon, is the brightest of all the night-time stars: Sirius, the dog-star, in the constellation of Canis Major, the great dog. The lesser dog, Canis Minor, is higher and farther east, with the star Procyon, another of the first astronomical magnitude.

But it is above Canis Major that we find Orion, one of the most conspicuous constellations in the sky. The three stars in a row form the warrior's belt. Still higher

is Betelgeuse and another star to the right, called Bellatrix, which marks his shoulders. Rigel, on the opposite side of the belt, is in one leg, according to the pictures drawn around the stars on the old celestial maps.

Above Orion we find Taurus, the bull, with first-magnitude Aldebaran still higher and a little to the left stands Auriga, the charioteer, which contains the brilliant star Capella. And below Auriga are Gemini, the twins, with Castor and Pollux.

Jupiter Only Planet

Though the southwestern part of the sky is poorer in bright stars, it does supply the only planet now prominent. This is Jupiter, even brighter than Sirius. It is seen in the southwest as darkness falls at the beginning of December. Then it sets in the west around 11:00. By the end of the month it will set about 9:00 p.m.

Also visible, though much fainter, is the planet Mars. This planet sets about two and a half hours after the sun and is not shown on the maps. It is in the constellation of Capricornus, the sea-goat, which is next to Aquarius.

The planet Venus has now moved into the evening sky, though it will not be until the end of December that there will be any chance of getting a glimpse of it. Even then it sets less than an hour after the sun, and will not be easy to locate. However its great brightness, many times that of Jupiter, may enable one to pick it up near the southwestern horizon as darkness begins to fall. One should keep watching for it, however, for by the end of January it will be readily found. And during the late winter and spring it will be conspicuous in the evening sky.

Still another planet, Saturn, in the con-

stellation of Virgo, the virgin, may be seen later in the night. At the beginning of December it rises in the east in early morning, and before midnight at the close of the month.

In classifying the stars and other heavenly bodies by their brightness, astronomers make use of "magnitudes." Most of the brightest stars are of the first magnitude, though two—Sirius, the dog-star, and Canopus, which is visible only from more southerly countries than most of the United States—are even brighter and need a magnitude still lower than the first. Thus these are given negative numbers. Sirius, for example, is of magnitude minus 1.58 and Canopus of minus 0.86.

The difference between first and second, or between any two magnitudes, is in the ratio of 2.51. This seemingly curious figure was chosen because a difference of five magnitudes is a difference of brightness of exactly 100 times.

While the greatest telescopes permit recording stars as faint as the 20th magnitude, it is usually considered that the sixth is about the faintest that can be seen with the unaided eye. Of course, this is merely an approximation. A person with particularly keen eyesight, and on a night when the sky is unusually dark and clear, might be able to see down to the seventh magnitude or perhaps even fainter.

Hard To See in City

On the other hand, from a large city or its environs it is difficult to see stars of the fourth magnitude. Stars down to that faintness are shown on our maps. To show fainter ones would crowd the maps unduly and not greatly help our readers, since many of them are located where such stars could not be seen in any event.

However, on the southern chart for December we have indicated the position of an object that is considerably fainter. It is in the constellation of Gemini, the twins, close to the edge of the map. It is marked

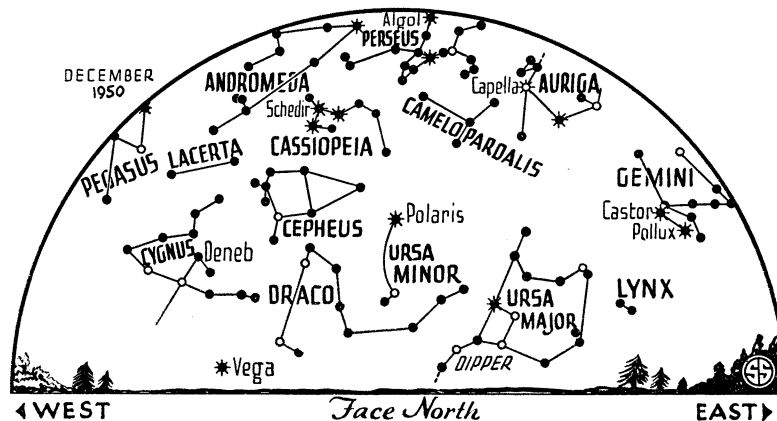
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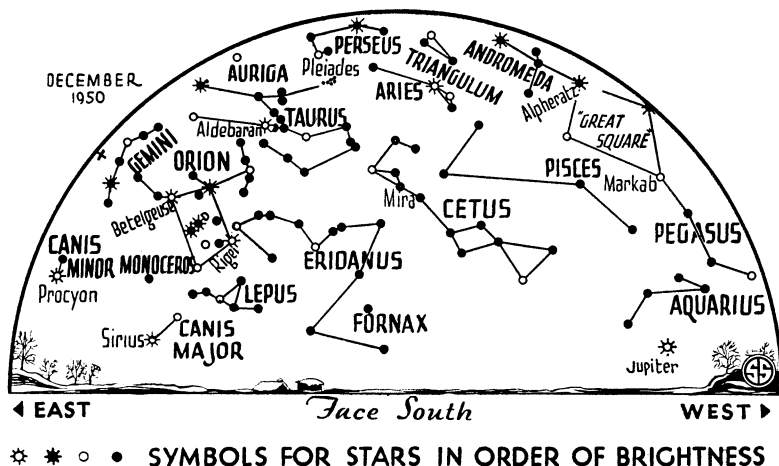
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in the form of an X and shows the position of the planet Uranus, to which this earth this month makes its closest approach of the year. At that time our planet and Uranus will both be in the same direction from the sun and we will be separated by only 1,663,000,000 miles, considerably less than the 1,965,000,000 to which it can recede from us.

At that time Uranus is closest, on Dec. 29, its magnitude is 5.8. It changes little through the month, however, so that a person with average good eyesight and a clear dark sky should be able to find it. A small telescope or a good pair of binoculars will help one to pick it up. Through a large enough telescope it will be seen to have a distinct disk, unlike the stars which appear as mere points of light whatever telescopic power is used.

It was this that enabled the great English astronomer, William Herschel, to discover Uranus on March 13, 1781. Then, as now, it was in the constellation of Gemini. He realized that it was not a star but thought it to be a comet. This was hardly surprising because no astronomer before had ever discovered a new planet. Later, however, it was shown to be a planet, revolving around the sun, at an average distance of 1,785,000,000 miles every 84 of our years. Its diameter is about 32,000 miles, or just four times that of the earth, though it revolves more

rapidly than our home, turning once in less than 11 hours.

Uranus has five "moons" or satellites.

Celestial Time Table for December

Dec.	EST	
2	11:22 a. m.	Moon in last quarter
5	11:11 p. m.	Algol (variable star in Perseus) at minimum brightness
8	8:00 p. m.	Moon nearest, distance 221,700 miles; Algol at minimum
9	4:28 a. m.	New moon
	3:28 p. m.	Moon passes Venus
11	4:49 p. m.	Algol at minimum
	8:19 p. m.	Moon passes Mars
12	early a. m.	Shower of meteors radiating from constellation of Gemini
14	7:43 a. m.	Moon passes Jupiter
15	10:00 a. m.	Mercury farthest east of sun
16	12:56 a. m.	Moon in first quarter
21	9:00 p. m.	Moon farthest, distance 252,400 miles
22	5:14 a. m.	Sun farthest south, winter commences in northern hemisphere
24	5:23 a. m.	Full moon
26	12:55 a. m.	Algol at minimum
28	9:44 p. m.	Algol at minimum
29	1:00 p. m.	Uranus nearest, distance 1,663,000,000 miles
31	12:57 p. m.	Moon passes Saturn
	6:33 p. m.	Algol at minimum

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

Science News Letter, November 25, 1950

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