

ASTRONOMY

Orion Prominent in East

The planets of Venus, Jupiter, Mars and Saturn can be seen either early or late. Sirius, one of the closest stars, appears to be the most brilliant.

By JAMES STOKLEY

➤ **THOUGH** four planets may be seen on the evenings of December, one has to look for them either early or late. Thus, they do not achieve a place on our maps, for these depict the heavens as they appear about 10:00 p. m. at the beginning of the month, and an hour earlier in the middle.

If you look low in the southwestern sky soon after the sun has set you will see two planets in the gathering dusk. The brighter will be Venus, which reaches greatest brilliancy the day after Christmas, when it is about 58 times as bright as a typical star of the first magnitude. The other planet is Jupiter. Though this is really very bright, it is only about a twelfth the brilliance of Venus, which is now at one of its extremes.

At the beginning of the month, Venus will be to the west of Jupiter, but passes it on the evening of Dec. 6. The time of closest approach (10:00 p. m. EST) will be after the planets have set in the eastern part of the country, but in the west they will still be visible. Even along the Atlantic coast, however, they will form a strikingly close pair that evening before they disappear behind the western horizon. And on Dec. 22, the crescent moon passes them, adding to the spectacle.

Mars and Saturn in East

Our other two December planets rise in the east about midnight, and these also are very close together. They are Mars and Saturn. Of very similar brightness at present, Mars is of magnitude one, while Saturn is about five-sixths as bright. The red color of Mars, fortunately, makes it easy to identify. Mars has been to the west of Saturn, but on Nov. 30 passed its fainter brother, and during December is toward the east and south, gradually drawing farther away.

Among the stars of the month, the brilliant constellation of Orion, the warrior, is most prominent, as he always is in our winter skies. To locate him, look to the southeast, for the three stars in a row that mark his belt. The two bright stars just above, of which Betelgeuse is one, mark his shoulders, while Rigel, below, is in one of his feet. As depicted in the old star maps, which showed the actual figures around the stars, he is depicted as holding an up-raised club, defending himself from the charge of Taurus, the bull. This animal forms another constellation, above and to

the right, with first magnitude Aldebaran as one of his eyes.

Stars of Month

On the other side of Orion, shown low in the east, are the two dogs, Canis Major and Canis Minor, which contain the stars Sirius and Procyon. Of all the stars we see in the night-time sky, Sirius is brightest, almost as bright as Jupiter. Actually it is not so bright as stars go, but looks so brilliant because it is one of the closest of the stars.

Alongside Orion, to the north, we can see Gemini, the twins, with the stars Castor and Pollux, the latter the more brilliant. And above them we find Auriga, the charioteer, with Capella, still another star of the first magnitude.

Calendar Erroneous

With the arrival of December, and the imminent approach of another year, the calendar comes to mind, and this time it seems to have particular significance, for the transition from the first to the second half of the 20th century is not far off. Already the letters in one national weekly have discussed candidates for the title of the "man of the first half century." Many of these correspondents doubtless think that the half century will end this month, and that Jan. 1, 1950, will begin the second half. No doubt there will be much discussion of the problem, as there was in January, 1900, when many, many persons thought that the 20th century was starting.

Actually, however, 1900 was the last year of the 19th century. The 20th century began on Jan. 1, 1901, and the second

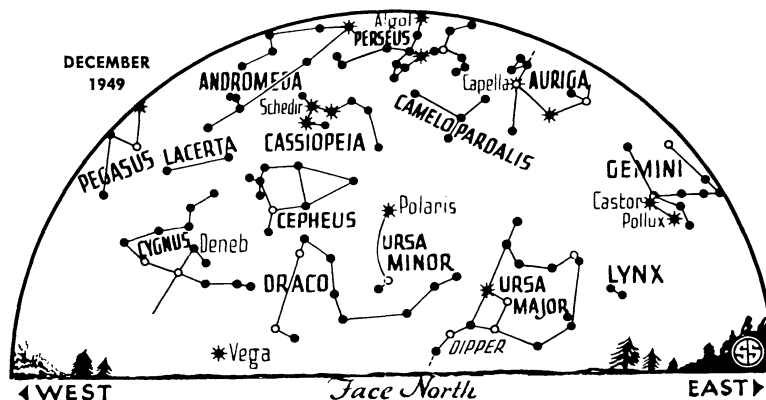
half of that century will begin Jan. 1, 1951. This is readily apparent when we consider the beginning of the Christian era, which we use in our reckoning, and the fact that it takes 100 years to make a century, just as it takes 100 cents to make a dollar.

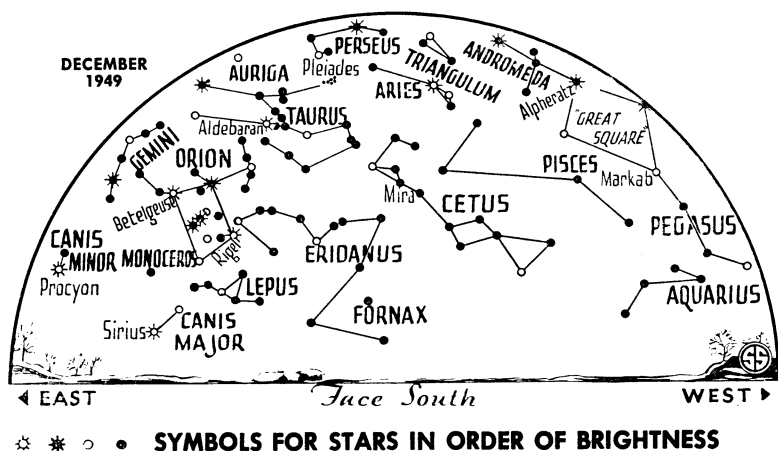
If you are saving money, a cent at a time, your first penny starts your first dollar. When you have 99 pennies, however, you do not have a dollar, but that is completed with the hundredth. Penny number 101 starts your second dollar, which is completed when you have a total of 200. With 1,899 pennies you are one cent short of \$19.00, for 1,900 are needed to make that amount, and the 1,901st penny starts your twentieth dollar.

Exactly the same reasoning may be applied to the years. The year 1 A. D. was the first of the first century, which was completed at the end of the year 100 A. D. The second century began with 101, the third with 201, and so on, until 1901, which began the 20th century. Since 1950 completes 50 years, which is a half century, the second half of the present century begins on Jan. 1, 1951, and will end on Dec. 31, 2000.

Although we use the term "anno domini," or "the year of our Lord," and say that this is the year 1949 by that reckoning, it is a fact that Christ was born at least 1,953 years ago. We know that He was born during the reign of King Herod, who, according to the Jewish historian Josephus, died shortly after an eclipse of the moon. The only eclipse which could fit was one that occurred March 13, 4 B. C., so evidently the Nativity was earlier than that.

It was not until the early part of the sixth century that a monk named Dionysius Exiguus introduced the practice of counting years from the birth of Christ. Prior to that, in countries connected with the Roman Empire, years had been counted A. U. C.—"from the founding of the city," i. e., of Rome. Dionysius followed a tradition that





Christ had been born in the 28th year of the reign of the Emperor Augustus, and assumed that this reign started in the Roman year 727. Adding 28 years brought him to the year 754 A. U. C., so Dionysius took this as 1 B. C. in the new reckoning, and made the following year, 755 A. U. C., the year 1 A. D.

The monk was mistaken. It was in 727 that Augustus began his reign under that name, but he became emperor four years earlier. This was after the battle of Actium, which he, as the General Octavius, won against the armies of Antony and Cleopatra. After ruling for four years under his own name, he took the name of Augustus in 727 A. U. C. Though Dionysius' mistake has long been known, it would cause much confusion to correct it now, so we still continue with his system.

Time Table for December

Dec.	EST	
1	1:00 a. m.	Moon farthest, distance 251,900 miles
3	10:48 p. m.	Algol, variable star in Perseus, at minimum brightness
5	10:13 a. m.	Full moon
6	7:37 p. m.	Algol at minimum
	10:00 p. m.	Venus passes Jupiter
12	early a. m.	Meteors radiating from constellation of Gemini visible
	5:56 p. m.	Moon passes Saturn
	8:48 p. m.	Moon in last quarter
13	3:43 a. m.	Moon passes Mars
17	2:00 a. m.	Moon nearest, distance 226,500 miles
19	1:55 p. m.	New moon
21	11:24 p. m.	Sun farthest south, winter commences in northern hemisphere
22	3:21 a. m.	Moon passes Jupiter
	6:05 p. m.	Moon passes Venus
24	12:32 a. m.	Algol at minimum
	9:00 p. m.	Planet Uranus nearest, distance 1,669,000,000 miles
26	10:00 a. m.	Venus at greatest brilliancy
27	1:31 a. m.	Moon in first quarter
28	7:00 p. m.	Moon nearest, distance 251,400 miles
29	6:10 p. m.	Algol at minimum

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

Science News Letter, November 26, 1949

ENGINEERING

Air Compressor May Be New-Type Auto Engine

▶ AN AIR compressor from a German submarine may develop into a new type of automobile or truck engine, Stanford engineers assert. From pushing torpedoes to powering cars is an easy step. Its advantage over other engines is lightness, lack of vibration and low cost.

It is described by them as a "free piston" diesel compression. It will run on low grade oil. It can take 70 cubic feet of free air a minute and compress it to 3,000 pounds per square inch of compressed air. As an engine, it would produce hot gases, roughly at a pressure of 100 pounds per square inch, and these gases would drive a turbine which in turn would drive a shaft.

Tests on this former German U-boat compressor are being made by W. H. Chamberlain, graduate student in engineering. The work is sponsored by the Office of Naval Research. It is aimed at analyzing the thermodynamic and dynamic design aspects of both the air compressor and prime mover types of free piston systems.

The free piston engine is not new. It was invented by a Frenchman named Rault de Pescara some 20 years ago. He and other scientists in France are still carrying on extensive development work. It is the recent interest in this type of engine both in France and Germany that has inspired the American study.

The design of the engine is characterized by extreme mechanical simplicity, according to Prof. A. L. London of Stanford. Theoretically the free piston diesel-turbine prime mover has a higher thermal efficiency than the modern diesel.

Science News Letter, November 26, 1949

The Soviet port of *Murmansk* on the European Arctic coast is ice-free the year round because of the American Gulf Stream, part of which passes north of Norway into the Arctic Ocean.

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