ASTRONOMY

Venus Now Easily Visible

Saturn and Jupiter are also seen during December, but Venus far exceeds any other in brightness, and you will see it first in the western sky as dusk falls.

By JAMES STOKLEY

➤ THOUGH it doesn't quite manage to get on the accompanying maps, the planet Venus is now easily visible in the evenings. It stands in the constellation of Capricornus, the sea-goat. This group is just to the west of Aquarius, which is shown. By the times for which the maps are drawn (11:00 p.m. on Dec. 1 and 10:00 p.m. Dec. 15) this group has set. But, for about three hours after the sun goes down, Venus is visible. It is so bright, of magnitude minus 3.6, that it far exceeds any other star or planet, and if you watch the western sky as dusk falls you will see it long before any other appears. The evening of Dec. 18 brings an interesting sight, for at 7:00 p.m., EWT, Venus will stand very close to the crescent moon and we will have a real counterpart of the star and crescent insigne.

The only planet shown on the maps is Saturn, in the constellation of Gemini, the twins, seen high in the east. Just at present this famous planet remains visible all night. Of magnitude minus 0.2, it is brighter than any star with the exception of Sirius, the dog star.

Sirius is seen in the southeast, and its brilliance on the astronomical scale (which happens to be so arranged that very bright objects are indicated by a negative number, less than zero) is minus 1.6. Actually, however, Sirius is not an extremely bright star, it only looks brighter than some because it is one of the closest to us.

Jupiter Same Size

The third planet which is seen during December nights happens to be equal in magnitude to Sirius. This is Jupiter, appearing in the early morning hours, about 1:00 a.m. Its steady glow, however, is quite different from the scintillations of a star, even one so bright as Sirius.

Just above Sirius, these evenings, is Orion, the warrior, with brilliant Betelgeuse and Bellatrix. Above and a little to the left of Sirius is Procyon, part of Canis Minor, the little dog. Canis Major, of which Sirius is part, is the great dog.

Going above Orion we come to Taurus, the bull, containing the reddish star Aldebaran. Moving to the left from Orion we find Gemini, the twins, in which Saturn stands, as well as their permanent occupant, the first magnitude star Pollux. Castor, the other twin, is a little fainter—of second magnitude.

Above Gemini is Auriga, the charioteer, with Capella. This also is of first magnitude, and there are two other stars of this same brightness shown. One, however, seen near the northwestern horizon, is Vega, in Lyra, the lyre. It is so low that atmospheric absorption makes it seem a lot fainter than if it were higher in the sky. The same is true, to a less extent, of the other, which is Deneb, in Cygnus the Swan, above Vega. Earlier in the evening, of course, these stars will be better placed, and will shine more brilliantly.

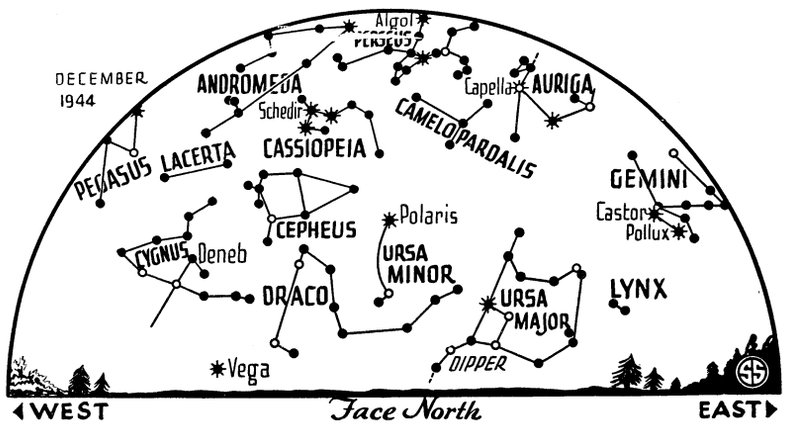
Winter Begins

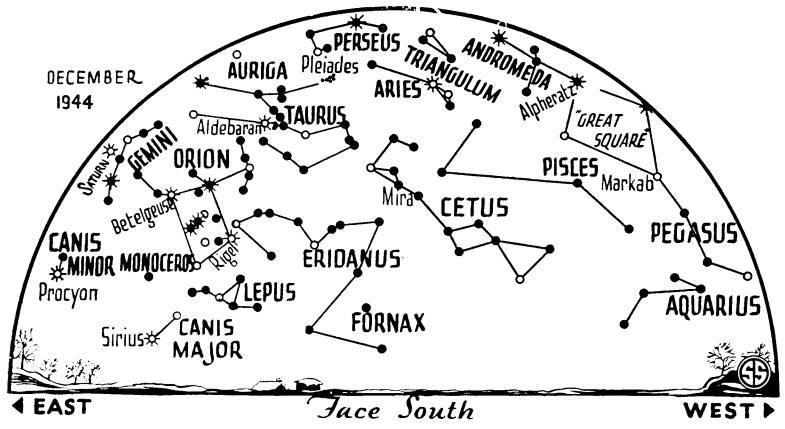
When the sun reaches its farthest south position in the sky on Dec. 21 at 7:15 p.m., EWT, we say that winter commences, also that this is the shortest day of the year. This is correct in one sense, if by day we refer to the time between sunrise and sunset. On Dec. 21, at 40 degrees north latitude, and on the central meridian of any of the time belts, the sun rises at 8:18 a.m., war time, and sets at 5:38 p.m. In any time zone sunrise and sunset would be earlier to the east of the standard meridian (75th for Eastern, 90th for Central, 105th for Mountain and 120th for Pacific time). West of these longitudes it would be later, since the apparent movement of the sun across the sky is from east to west. Thus the duration of daylight, at 40 degrees north latitude is only 9 hours 20 minutes on Dec. 21.

Six Hours Difference

In contrast, on June 21, the beginning of the past summer, the duration of daylight was 15 hours 1 minute. Sunrise was then at 5:31 a.m., and sunset at 8:32 p.m. The reason for this difference is the changing position of the sun in the sky. In June it was well to the north; it rose north of the east point and set north of the west point of the horizon. That meant that it had a long path across the sky. But this month, with the sun far south, it rises south of east and sets south of west. Its daily path is much shorter and so it is below the horizon much longer than it is above.

But we also use the word day to mean the time from noon to noon, including both daylight and darkness. In this sense, the days just before Christmas are the longest, not the shortest, of the year if we measure by the sun. At this time of year it takes the sun about 30 seconds longer than its average time to get from one noon day position to the next. About the tenth of September, on the other hand, the time it took the sun to get from the meridian around to it again was about 21 seconds less than average. The reason for this is found partly in the fact that the earth's motion around the sun is not exactly circular, but we are closer in January than in July.





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Actually, however, we do not use sun time, and it would be inconvenient to make clocks that had to run slower in December than September, so they are based on the mean and 24 hours of clock time is equal to the average time the sun takes to go around. The result of this is that at some times of year the sun reaches the meridian a number of minutes before noon, and at other dates it is late getting there. We call the difference between the two the "equation of time," and sundials are often provided with means for determining this, so that your watch can be adjusted from observations of the sun.

Celestial Time Table for December

Dec.	EWT	
2	3.57 a.m.	Moon passes close to Saturn
4	10:00 p.m.	Mercury farthest east of sun
7	10:57 a.m.	Moon in last quarter
8	3:31 a.m.	Moon passes Jupiter
	6:00 p.m.	Moon farthest, 251,400 miles
12	2:45 a.m.	Algol at minimum
		Meteors of Geminid shower
14	3:56 p.m.	Moon passes Mars
	11:34 p.m.	Algol at minimum
15	10:34 a.m.	New moon
17	8:23 p.m.	Algol at minimum
18	8:00 p.m.	Moon passes Venus
20	5:13 p.m.	Algol at minimum
21	7:15 p.m.	Winter commences
22	11:54 a.m.	Moon in first quarter
23	8:00 a.m.	Moon nearest, 230,000 miles
28	11:00 p.m.	Saturn nearest, 747,500,000 miles
29	9:44 a.m.	Moon passes close to Saturn
	10:38 a.m.	Full moon

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

Science News Letter, November 25, 1944

MEDICINE

Routine Transfusion

➤ THE AMOUNT of blood a patient loses during an operation is almost always more than the surgeon expects or than he estimates during the operation, Dr. Frederick A. Coller, Dr. Clarence E. Crook and Dr. Vivian Iob, of the University of Michigan Medical School, report (*Journal, American Medical Association*).

Average blood loss during removal of an appendix is 13 cubic centimeters, or slightly over one-third of an ounce. It is about six times that for a hernia operation. Largest average blood loss they give is the 1,084 cubic centimeters, approximately a quart, for brain operations.

Even the least blood loss retards convalescence, they believe, and all loss over 10 ounces in healthy adults should be replaced.

It is not practical for the surgeon to measure the exact blood loss during an operation at the time. The amount on sponges, dressings, gloves and instruments must all be taken into account for accurate measurements. So the Michigan doctors suggest relying on a knowledge of average blood losses as given in medical reports.

With this as a guide, the surgeon can arrange in advance for a blood transfusion instead of having to make the arrangements and give the transfusion after the patient has gone into shock from the loss of blood.

"The patient is benefited most," they conclude, "when the blood loss is replaced by blood, given as the loss occurs."

The report of the Michigan scientists is based on studies by other scientists as well as their own.

Science News Letter, November 25, 1944

A variation of 50 degrees in the *temperature* within 24 hours is considered drastic on the earth, but the change on the moon may be eight times as great.