

ASTRONOMY

Venus in Evening Sky

Bright and beautiful planet joins the bright stars of January. Is visible for about an hour after the setting of the sun. Can be seen before dark.

By JAMES STOKLEY

▶ **THOUGH** it does not show on the accompanying maps of the evening skies, the brilliant planet Venus is now coming into view after an absence of many months. During January it sets about an hour after the sun, actually before the end of evening twilight. However, it is so bright (magnitude minus 3.4 on the astronomical scale) that it can easily be seen low in the southwest even before darkness has fallen completely. It is slowly drawing away from the sun, toward the east, so in the coming months it will be setting later and later, thus becoming more and more prominent.

Our maps depict the appearance of the heavens at the beginning of January at about 10:00 p. m. your own kind of standard time, if you are located close to the central meridian of your time belt. These are the meridians marking 75 degrees west longitude for the Eastern time zone, 90 degrees for Central time, 105 degrees for Mountain time and 120 degrees for Pacific time. For observers well to the east of these meridians, the stars would be arranged as shown up to half an hour earlier, while those in the western parts of the time zone would get the same appearance a half hour or so later than 10:00 o'clock.

Because our time is based on the sun which moves eastward through the stars, they seem each evening to slip westward a little for the same time by the clock. By the middle of January, the maps will show the skies an hour earlier than they did at the start. They will be two hours earlier by the close of the month.

Another planet, however, almost gets on our maps. This is Jupiter, nearly five times fainter than Venus, but still brighter than any other star or planet. It sets around 8:30 at the middle of January and is in the constellation of Aquarius, the water-carrier. After the time for which the maps are drawn, a little before eleven, the planet Saturn rises in the east in the constellation of Virgo. Its brightness is about that of a typical first magnitude star.

Mars also is in the evening sky, in Capricornus, the same as Venus, and sets about an hour later than that planet. However, it is now so faint, because of its great distance from earth, and is so low, that it will be hard to find. The last of the five naked-eye planets, Mercury, is now in Sagittarius, the archer, which rises just ahead of the sun in the east. Around Jan. 23, when it is farthest west of the sun, it

may be possible to get a glimpse of this planet low in the southeast before sunrise.

As for the stars of January evenings, the winter constellations are now shining with their full glory. Brightest is Sirius, the dog-star, seen in the southeast in Canis Major, the great dog. Above and to the right is Orion, the warrior. Betelgeuse and Rigel are the two brightest stars in this figure, while between them are three stars in a row that form his belt.

Still higher and farther west is Taurus, the bull, with first-magnitude Aldebaran marking his eye. Capella, in Auriga, the charioteer, stands directly overhead. Moving downwards toward the east, we come to the twins Gemini, of which Pollux is the brightest star. Between Gemini and Canis Major is Canis Minor, the lesser dog, with the star Procyon.

In addition to these stars, two others of the first magnitude are shown, though they are so low that their light is considerably dimmed. Low in the east is Regulus, in Leo, the lion, which will be coming into better view during the coming months. On the other hand Deneb which is about all of Cygnus, the swan, that remains visible in the northwest, is about to disappear for a while.

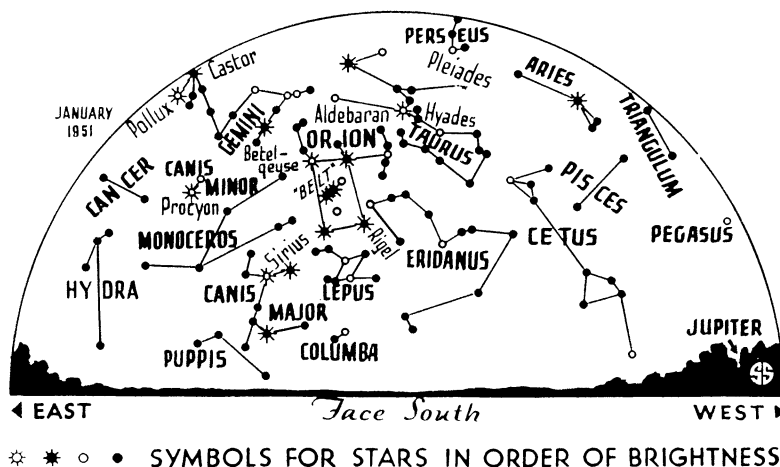
Of all the stars in the sky, except the sun, the brightest is Sirius, the dog-star, which now shines so brightly in the southeast. In its intrinsic brightness, or candlepower, it exceeds the sun by about 21 times. Many stars are far more brilliant than this. The reason Sirius looks so bright is because it is so close. While there are six stars, again excepting the sun, which are

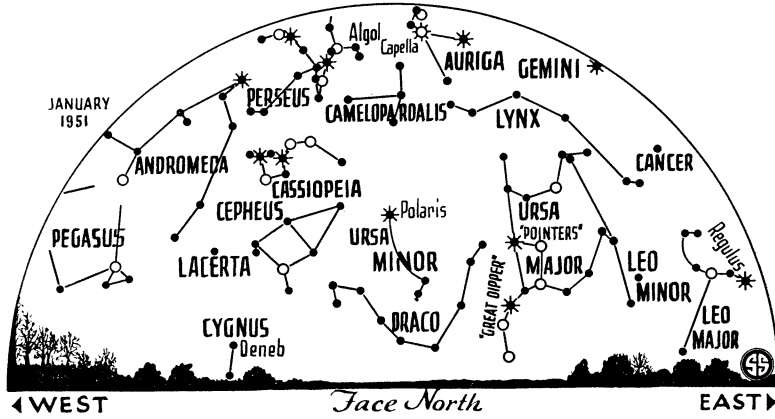
even nearer, four are so faint that a telescope is needed to show them despite their proximity. The other two are not visible from most of the United States, as they are from more southerly countries, so that Sirius actually is closest of the stars we normally see. Its distance is 8.7 light years, equal to about 52,000,000,000,000 miles—the length that a light beam will cover in 8.7 years, going 186,000 miles each second.

Over a century ago a German astronomer, named Bessel, plotted the movement of Sirius across the sky, which is fast enough to take it the space of the full moon's diameter in 1200 years. Bessel found that it did not move in a straight line, but swung first to one side, then to the other. This immediately suggested that there was not one star, but two, moving around each other, and that it was the center of gravity of the system that moved in a straight line. His prediction of such a companion was confirmed in 1862 when Alvan Clark, Jr., a Massachusetts telescope maker, happened to look at Sirius through a new telescope just completed for a Chicago observatory. The companion was revealed for the first time. Later studies have shown that the period of revolution of the two bodies is a little under 50 years.

Though Sirius is some 10,000 times as bright as its companion, the two are nearly the same color. This means that each is giving off a similar amount of light per square mile of surface. The only way for the companion to be so faint is for it to be much smaller than Sirius, and it turns out to be about the size of the planet Uranus. Yet, from the way it revolves around Sirius, its mass may be calculated, and it turns out to contain about the same amount of material as the sun does.

Since the diameter is about a thirtieth that of the sun, its actual volume is only about 1/27,000th, and with the same





amount of matter concentrated in so small a space, its density must be extraordinarily great. The old rule of "A pint's a pound, the world around," does not hold there! A pint of the stuff of Sirius B, as the companion is designated, would weigh about 20 tons.

Perhaps even more extraordinary is the fact that this superdense material is not even solid, but is a gas. Fortunately, however, modern atomic theory gives us an idea of how this might be. An atom, like the solar system, consists mostly of empty space. There is a nucleus around which, at various distances, are moving a number of electrons. Dr. R. S. Richardson, of the Mt. Wilson Observatory, compares atoms to a number of men, each of whom has a heavy weight on the end of a string, which he is rapidly whirling around his head. While they do this, the men could hardly approach each other very closely, but if the strings should break and the weights fly off, then the men could crowd very near together.

This is believed to be what has happened to the atoms in Sirius B and in other "white dwarf stars," some of which are nearly a thousand times as dense. With atoms tripped of their electrons, the nuclei (which have most of the mass), can come many times closer together. They may still be separated enough for them to move around freely and thus have the properties of a gas.

Celestial Time Table for January

Jan.	EST	
1	12:11 a.m.	Moon in last quarter
6	8:00 a.m.	Moon nearest, distance 223,500 miles
7	3:10 p.m.	New moon
8	6:27 p.m.	Moon passes Venus
11	7:31 a.m.	Moon passes Jupiter
14	7:23 p.m.	Moon in first quarter
17	11:27 p.m.	Algor (variable star in Perseus) at minimum
18	9:00 a.m.	Moon farthest, distance 251,900 miles
20	8:16 p.m.	Algor at minimum
22	11:47 p.m.	Full moon
23	5:05 p.m.	Algor at minimum
	11:00 p.m.	Mercury farthest west of sun
27	11:29 p.m.	Moon passes Saturn
30	10:13 a.m.	Moon in last quarter

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

Science News Letter, December 30, 1950

ARCHAEOLOGY

Find Ancient Camp Site About 12,000 Years Old

➤ **DIGGING** deep in the icy soil of northern Alaska, Robert J. Hackman, a U. S. Geological Survey worker, found remains of a camp site where prehistoric Americans bivouacked some 12,000 years ago.

The discovery was announced in Washington by the Smithsonian Institution, which has received from Mr. Hackman a considerable collection of stone points, work of the ancient people.

The collection includes lamellar flakes and burins similar to those found by Dr. J. L. Giddings, of the University of Pennsylvania, under seven feet of soil on Cape Denbigh. The Giddings finds are considered the oldest work of man in the New World and resemble the work of Stone Age man in the Old World. The new collection was found buried about ten inches deep in Anaktuvuk Pass through the Brooks Range in northern Alaska.

A similar find was made independently at about the same time by William Irving, a student at the University of Alaska. Mr. Irving's discovery was made not far from

Mr. Hackman's, and it was also probably remains of a bivouac on the trail taken by the first Americans from the Alaskan coast to the interior of the North American continent.

In addition to the flakes like the Cape Denbigh culture, the Hackman collection includes some Folsom-like points which link this ancient people to ancient man in the United States Southwest. There were also points of unique design.

Unfortunately, no organic matter was found with the stone points that could serve to date them by the radioactive carbon calendar method. Antiquity of the specimens was calculated from study of the geology of the site and the style of workmanship of the points.

Another Geological Survey worker, Milton C. Lachenbruch, found two Folsom points near the headwaters of the Noatak River, just beyond the Brooks Range. This site was probably a third bivouac in the great migration.

Science News Letter, December 30, 1950

PUBLIC HEALTH

Cholera in India Not Alarming in U. S.

➤ A **CHOLERA** outbreak in India "does not make news" to health authorities in the United States, Dr. G. L. Dunnahoo, director and chief of the foreign quarantine division of the U. S. Public Health Service, commented on reports that the disease is attacking hundreds of thousands on a pilgrimage to the village of Rantali in eastern India.

Cholera is always smoldering in India. World Health Organization has been getting reports of four to eight thousand cases weekly for months.

When cholera jumps a thousand miles, as it did in the Egyptian outbreak in October, 1947, it is news to health authorities as well as the general public. But the chances of it spreading to the United States are very slim. One or two cases might come in by plane. U. S. quarantine officers, however, are stationed at international airports here to guard against just that happening. Passengers from regions where cholera exists must be vaccinated. If in spite of this a case is found on a plane or boat arriving in the United States, passengers and crew are held in quarantine for five days. This is the length of time it takes cholera to develop.

The disease spreads through contaminated drinking water, food and eating utensils. Vaccination is the weapon used to check outbreaks.

Chloromycetin and other antibiotic drugs and sulfa drugs have all been tried as remedies, but none has been an unqualified success.

Science News Letter, December 30, 1950

INDEX OF REFRACTION LIQUIDS

For Identification of Minerals & other Solids by the Immersion Method of Microscopy
Range 1.400-1.700, intervals of 0.002 or as selected. Index certified to 0.0002
Range 1.71-1.83, intervals of 0.01

Write for Price List Nd-SNL

DENSITY LIQUIDS

For identification of minerals, gems and other substances by the sink-and-float method. New suspensions extend the working range up to density of 7.

Write for leaflet D-SNL

R. P. CARGILLE

118 Liberty Street New York 6, N. Y.