

ASTRONOMY

# Venus Appears Early

A brilliant display of stars, with Mars easily visible and Venus beginning to show after sundown, can be seen in the January skies.

By JAMES STOKLEY

► TO THE usual display of brilliant stars in the January evening sky there is added this month the planet Mars.

Although rapidly fading from its great brilliance at the time of its close approach in November, it is still brighter than any of the stars now visible, except one. The exception is Sirius, the dog star, seen to the southeast, in Canis Major, the great dog. Mars is in Aries, the ram, high in the southwest. After sunset, as darkness falls, Mars may be seen well up in the western sky. It remains visible until about 3:00 a.m.

The positions of Mars and Sirius, as well as the other stars now seen, are shown on the accompanying maps. These show the way the sky looks about ten o'clock your own kind of standard time, at the beginning of January, about nine o'clock in the middle and eight at the end.

### Brilliance in the Southeast

It is to the southeast that the most brilliant display of stars is found these evenings. In fact, there is no other part of the sky of similar area with so many bright ones. Sirius, as noted above, is the brightest. Above it, and to the right, stands Orion, the warrior, in which there are two stars of the first magnitude, Betelgeuse and Rigel. As depicted on the old star maps, with Orion's figure drawn around the stars, Betelgeuse was in one of his shoulders, and Rigel in his upraised left knee. The row of three stars between them represented his belt.

High in the south, just to the right of Orion, is Taurus, the bull, supposedly charging at the warrior.

In Taurus is the bright star called Aldebaran, distinctly red in color, which marks the animal's eye. In his shoulder, a little higher and to the right, is a cluster of fainter stars called the Pleiades. Six of these are visible to the naked eye, while many more may be seen through a telescope, a pair of binoculars, or even opera glasses.

Directly overhead (at the times for which these maps are prepared) is Auriga, the charioteer, in which stands the brilliant Capella. To the east of Auriga, you come to Gemini, the twins, with Pollux, of the first magnitude, and Castor, of the second. A little lower and farther south, about halfway between Pollux and Sirius, is Canis Minor, the lesser dog, with Procyon, another first magnitude star.

This brilliant array of stars forms an irregular pentagon surrounding Betelgeuse. Starting with Capella, and going clockwise,

they are Aldebaran, Rigel, Sirius, Procyon and Pollux.

In addition, two other first magnitude stars are shown on the maps. One is Deneb, in Cygnus, the swan, low in the northwest. Because it is so near the horizon, much of its light is absorbed by the earth's atmosphere, and it appears much fainter than it does when higher in the sky. In the east is Leo, the lion, also dimmed by its low altitude, although not as much as Deneb.

Although Mars is the only planet shown on the maps, Venus is now beginning to enter the evening sky. It can be seen low in the southwest for about an hour after the sun goes down. Jupiter, in Libra, the scales, rises in the southeast about four hours ahead of the sun. It is followed, about two hours later, by Saturn, which is in Sagittarius, the archer. In addition, during the first few days of January, you may get a glimpse of Mercury, low in the southeast, just before the sun comes up.

A star may look bright for one of two reasons. It may really be very brilliant, as measured by candlepower, or it may look bright because it happens to be much closer than a more brilliant orb many times farther away.

This principle is well-demonstrated by the array of bright stars in and around Orion.

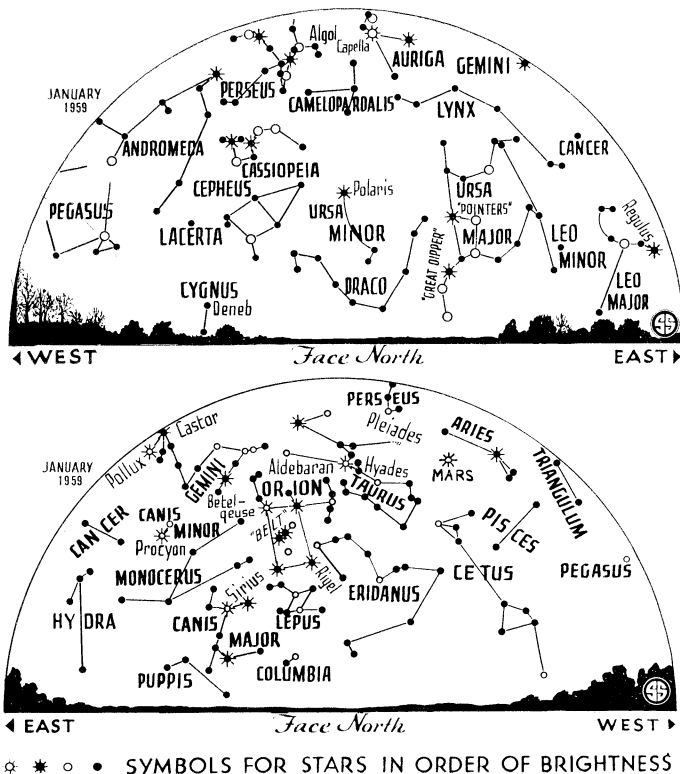
For example, take Sirius, which is the brightest star that we can see in the nighttime sky.

Astronomers express stellar brightness in magnitudes. A star of the first magnitude is 100 times as bright as one of the sixth, which is the faintest that can be seen with the naked eye. But Sirius is much brighter than the average star of the first magnitude, so it has been necessary to put it at magnitude minus 1.6. This is about 13 times as bright as Pollux, which is the faintest of the group we are considering. Rigel is in an intermediate position, about a sixth as bright as Sirius.

### Star Distances

Looking at the stars in the sky, their distances cannot be determined. The astronomer, however, has various methods whereby he can determine their distances. He has found that Rigel is about 63 times as far as Sirius. Light travels about 186,000 miles in a second. Coming from Sirius it reaches the earth in about 8.7 years, while that from Rigel takes about 543 years for the journey. If Rigel were moved in to the distance of Sirius, it would be about 4,600 times as bright; it would equal the moon in brilliance. The actual brightness of Sirius is about 27 times that of the sun (which is only 93,000,000 miles, or 8.3 light-minutes, away). Rigel, however, exceeds the sun some 18,000 times.

Among the other stars of Orion and its vicinity, the number of times they exceed the sun in brightness are as follows: Ca-



Antares, 140; Betelgeuse, 2,900; Procyon, 5.6; Aldebaran, 100, and Pollux, 29.

Looking ahead on the 1959 celestial program, we find that there is a total eclipse of the sun—the first visible in any part of the United States since 1954—on Oct. 2. Even though the path crosses Massachusetts, it is rather doubtful how well it will be observed; it happens just after the sun has risen. Thus, the sky would have to be clear at sunrise, right down to the eastern horizon. If not, the eclipse will not be seen, from that part of the world at least.

From the New England coast, the track of the moon's shadow, in which the eclipse will be total, crosses the Atlantic Ocean and northern Africa, ending in the Indian Ocean south of Arabia at sunset. The locations in Africa are much more favorable than Massachusetts. Many astronomers will be located in Africa to make the observations that can be made most easily when the sun's bright disc is momentarily hidden by the moon.

### Celestial Time Table for January

Jan.	EST	
1	8:00 p.m.	Sun nearest earth for year, distance 91,344,000 miles.
2	5:50 a.m.	Moon in last quarter.
5	6:24 a.m.	Moon passes Jupiter.
	3:00 p.m.	Moon nearest for month, distance 228,100 miles.
9	12:34 a.m.	New moon.
	4:23 a.m.	Algol (variable star in Perseus) at minimum brightness.
12	1:11 a.m.	Algol at minimum.
14	10:00 p.m.	Algol at minimum.
16	4:26 p.m.	Moon in first quarter.
17	noon	Moon farthest, distance 251,200 miles.
	6:50 p.m.	Algol at minimum.
18	5:38 p.m.	Moon passes Mars.
24	2:32 p.m.	Full moon.
31	1:00 a.m.	Moon nearest, distance 230,100 miles.
	2:06 p.m.	Moon in last quarter.

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

Science News Letter, December 27, 1958

### EDUCATION

## Fall College Enrollment Rises 7th Straight Year

➤ AN ALL-TIME high enrollment of 3,258,556 full and part-time students in U.S. colleges and universities for the fall of 1958 has been reported.

This was the seventh consecutive year that new records were set for fall enrollments.

Enrollment for the fall of 1957 was 3,068,417 students. Thus, the 1958 enrollment exceeded the past year's by 190,139, U.S. Commissioner of Education Lawrence G. Derthick said.

The 1958 enrollees included 2,110,426 men and 1,148,130 women. The survey includes all degree-credit students. These are students whose current program consists principally or wholly of work normally creditable toward at least a bachelor's degree.

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### BIOLOGY

## "Snails" Link With Past

➤ BELIEVED extinct for 300,000,000 years, four little snail-like creatures have been dredged up from the depths of the Pacific Ocean.

One of them is being flown to New York while scientists aboard the Columbia University research vessel "Vema" try to keep three of its fellows alive. Dr. J. Lamar Worzel, chief scientist on the "Vema," is bringing back the specimen together with pictures of the ocean floor where the animals were found.

The tiny *Neopilina* has been hailed as the oldest living representative of the primitive ancestors of a "really successful animal group"—the snails and chitons, and possibly the clams.

Only one other animal link with the prehistoric times can claim such a long past. This is the *Lingula*, a shell-bearing brachiopod living in the shallow waters off Japan.

Dr. John Imbrie, associate professor of geology at Columbia, described the snail-like *Neopilina* as about one and one-half inches long with a conical shell resembling a miniature dunce cap.

"This type of animal happens to be important biologically," Dr. Imbrie said, "because it is representative of a group known as the monoplacophora, called 'monoplacs,' a primitive group of snail-like creatures that began their history 500,000,000 years ago and until recently were thought to have become extinct 300,000,000 years ago.

"In their heyday they lived in shallow water along the shores and they are the ancestors of snails and 'chitons,' coat-of-mail snails that cling to rocks on the sea-

shore and are quite common today . . . It might be said that the 'monoplacs' have been replaced by their more advanced descendants."

In the millions of years since the "monoplacs" were common they apparently retreated from the shores to the ocean floor more than 10,000 feet down.

The specimens found by the Columbia researchers were caught in nets at a depth of more than three miles. They were taken from an ocean trench some 200 miles west of Lima, Peru.

Although the animals experienced a temperature change of about 60 degrees (it is near freezing at the ocean depths), the change from pressure found three miles down to that found at the ocean surface is not expected to affect the specimens. *Neopilina* have no air sacs and so could not "explode" because of pressure changes.

The tiny sea creature has changed little from its ancestors of the Cambrian period.

Before this time animals that lived in the seas had no skeletons and we have no direct knowledge of what they looked like. With the "monoplacs," Dr. Imbrie explained, a few shell fish appeared and "for the first time we had living in the seas animals possessing skeletons which could be preserved."

The research vessel "Vema" left New York on Oct. 15 for a ten-month scientific voyage that is expected to provide a major contribution to the knowledge of biology, geology and oceanography of the South American area and of the South Atlantic Ocean.

Science News Letter, December 27, 1958

### MEDICINE

## Plan Medical Year

➤ LOST IN the hubbub around his recent return from Moscow was Sen. Hubert Humphrey's agreement with Premier Khrushchev on international medical research cooperation.

The Soviet leader's offer to "help" implement the medical program put forth by the Minnesota Democrat was all but ignored.

Sen. Humphrey reported that during his eight-hour conference at the Kremlin, Mr. Khrushchev said, "I will help," in answer to various proposals and gave his "enthusiastic approval" to the overall program. The program includes:

1. "Full speed ahead" on plans for an International Medical Year on research and public health, possibly to begin in June 1961 and continue for 12 to 18 months.

2. An increase in the flow of medical data between East and West.

3. Greater personal contact between U.S. and Soviet medical scientists through correspondence and visits, and more participation in international meetings and in panels of experts of the World Health Organization.

4. Broadening of the medical provisions of the Lacy-Zarubin Agreement which covers U.S.-Soviet exchanges in the fields of science, technology and education.

5. Collaboration in intensified peri-natal research, covering the period from the 20th week of pregnancy to the first month after birth. (This was one of the proposals that elicited Premier Khrushchev's personal response to help.)

Most of Sen. Humphrey's program is included in a bill submitted by Sen. Lister Hill (D., Ala.) near the end of the last Congress. The bill is expected to pass in the next session.

The International Medical Year would differ in character from the now-ending International Geophysical Year in that it would be a kind of "launching platform" for research in the years ahead. It would consist of broadening epidemiological reports throughout the world, a drive for raising national health research budgets, more international meetings, increases in fellowship awards and attempts to single out one or two diseases for eradication.

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