

## ASTRONOMY

# Brilliant Evening Star

Venus outshines all other planets and stars. The vernal equinox in March heralds the beginning of spring in the Northern Hemisphere.

By JAMES STOKLEY

► SHINING MANY TIMES more brilliantly than any other star or planet now visible in the evening, Venus is becoming more and more conspicuous. Coming into view in the west long before the sky is dark, it remains visible during March for about three hours after sunset.

On March 1 its distance from earth is about 94.4 million miles, but by the end of the month this is reduced to 85 million. It will continue to approach us until it swings between sun and earth in mid-June.

At the beginning of March you will also be able to see Jupiter low in the west in the early evening, a little below Venus. Although only about an eighth as bright as Venus, Jupiter is still very brilliant. However, it is drawing toward the sun in the sky. By March 31 you will have to look low in the west, soon after sundown, to see Jupiter. It is now gradually drawing away from the earth and at mid-March its distance is about 546 million miles.

## Other Planets

As for the other planets sometimes visible to the naked eye—Mercury, Mars and Saturn—they are too close to the sun for observation this month.

The accompanying maps show the sky as it appears about 10 p.m., your own kind of standard time, on March 1, an hour earlier on the 15th and two hours earlier on the 31st. Venus barely gets on, while Jupiter has already set by the times mentioned.

Sirius, the "dog-star," is part of Canis Major, the great dog. It is the brightest star in the sky and is visible in the south. Above it is Procyon, in the lesser dog, Canis Minor. And still higher are the bright stars Castor and Pollux in Gemini, the twins.

To the right of Canis Major, and a little higher, stands the brilliant constellation of Orion, the warrior. This has two stars of the first astronomical magnitude: Betelgeuse (above) and Rigel (below). Between them is Orion's belt, formed by a row of three stars.

Still farther to the right (shown partly on the northern sky map and partly on the southern) stands Taurus, the bull, with brilliant Aldebaran. This star is reddish in color. And above Taurus is Auriga, the charioteer, with creamy-white Capella.

High in the northeast you can see Ursa Major, the great bear, of which the familiar big dipper is part. In this group are the pointers, whose direction leads you to Polaris, the pole star, part of Ursa Minor, the lesser bear.

And if you follow the curve of the dipper's handle downwards and to the right you reach another first-magnitude star. This is Arcturus, in Bootes, the herdsman. Farther right is Virgo, the virgin, with Spica near the horizon. This also is of the first magnitude, but it is greatly dimmed just now because it is so low and therefore is shown as third magnitude.

But if you go upwards from Virgo, you come to Leo, the lion. In this constellation is a sub-group called the sickle. First-magnitude Regulus marks the handle of this implement.

March also brings to those of us who dwell in the Northern Hemisphere the beginning of spring on March 20. In addition, this year, it brings Easter, at the rather early date of March 29. This is by no means as early as it can come.

However, in only four of the remaining years of the 20th century will it come as early. Easter in 1970 will again come on March 29, while in 1967, 1978 and 1989 it will fall on the 26th.

Easter, it is generally said, comes on the Sunday after the first full moon on or after the vernal equinox. The vernal equinox is the moment at which the sun, in its northward journey through the sky, crosses the equator. It marks the beginning of spring

in the Northern Hemisphere, and of winter in the southern. In 1964 the equinox comes at 9:10 a.m., EST on Friday, March 20. The next full moon comes on Friday, March 27, at 9:49 p.m., EST. And so Sunday, March 29, is Easter.

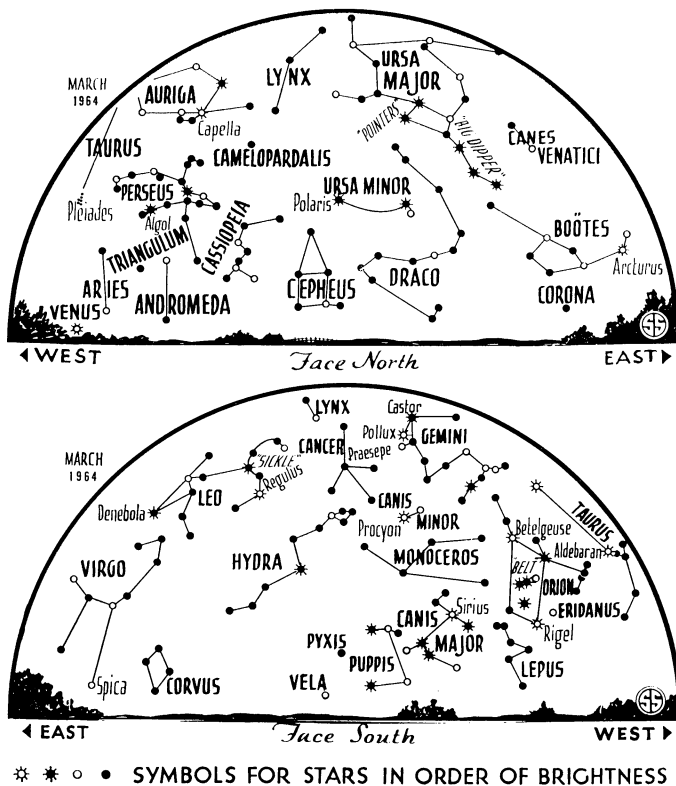
But in some years it doesn't work out so nicely. According to the actual Easter rule, formulated by the Jesuit astronomer Clavius, who helped Pope Gregory XIII reform the calendar in 1582, it is not the actual equinox but the 21st of March, its average date.

And it is not the astronomical full moon, but the fourteen-day-old moon, measured after new moon. The true full moon's age is more nearly 15 days. So sometimes Easter comes on a day quite different from what you might expect on the basis of what is happening in the sky.

## Determining Easter Date

There is a rule for determining the date of Easter from the year number, but it involves a considerable amount of calculation. Easter can actually be determined with the aid of a series of tables, which are used by ecclesiastical authorities. These were issued by authority of Pope Gregory XIII nearly four centuries ago.

If the 14th day of the moon, or paschal moon, falls on March 20, it will be a day ahead of the ecclesiastical equinox. If the 20th is a Saturday, the paschal full moon will come on Sunday, April 18. Then Easter will be the following Sunday, April 25, which is the latest possible date.



But if the 14th day of the moon is on March 21, and that day is Saturday, the next day, March 22, is Easter. This is the earliest that it can occur.

This last happened in 1818, and does not happen at all this century. In 1913 it came on March 23, in 1940 on March 24, and in 1951 on March 25. The last time Easter came on April 25 was in 1943—it will happen again in 2038. In 2011 it will come on April 24, and in 2000 on April 23. In 1962 it came on April 22 and this will happen again in 1973.

You will notice that if the paschal full moon comes on a Sunday, Easter will be the following Sunday. This rule was established in 325 A.D. by the Council of Nicaea, to make sure that Easter would never coincide with the Jewish Passover, which comes at the full moon after March 21. If that full moon comes on Sunday, it is the beginning of Passover, and Easter comes a week later.

In recent years there has been an active movement to stabilize Easter, perhaps on the second Sunday of April, which would be close to the presumed Crucifixion date. In 1928 the British Parliament passed a law which would fix Easter as the Sunday after the second Saturday in April. However, it provided that it would become effective only after other nations had agreed to do the same, which so far they have not done.

### Celestial Time Table for March

#### MARCH EST

3	7:00 a.m.	Pluto opposite sun and nearest earth; distance 2,964,000,000 miles
5	noon	Moon farthest from earth; distance 251,200 miles
6	5:00 a.m.	Moon in last quarter
7	1:00 a.m.	Algol (variable star in Perseus) at minimum brightness
9	9:50 p.m.	Algol at minimum
11	Midnight	Moon passes Saturn
	6:40 p.m.	Algol at minimum
13	3:00 a.m.	Mercury passes behind sun
	9:14 p.m.	New moon
15	9:00 p.m.	Moon passes Jupiter
17	1:00 a.m.	Moon passes Venus
	11:00 a.m.	Moon nearest; distance 228,200 miles
20	9:10 a.m.	Sun over equator; spring commences in Northern Hemisphere
	3:40 p.m.	Moon in first quarter
27	2:40 a.m.	Algol at minimum
	9:49 p.m.	Full moon
29	11:30 p.m.	Algol at minimum

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

• Science News Letter, 85:122 Feb. 22, 1964

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