

ASTRONOMY

Mercury and Venus Appear

All five naked eye planets visible during March evenings, though not at the same time. Vernal equinox, the beginning of spring, occurs on March 21.

By JAMES STOKLEY

► FOR A FEW DAYS, around March 9, it may be possible during a single evening to see all five of the naked eye planets, though they will not be visible at the same time. Mercury, the most rarely viewed of the five, will be at its greatest distance to the east of the sun on the 9th. Then it will follow the sun in the sky and remain above the horizon after the sun has descended from view. This is not the only time in 1946 that Mercury thus reaches "greatest eastern elongation," as it is called. However, when this occurs in March, near the beginning of spring, it offers the most favorable conditions for viewing Mercury. Then the separation from the sun is in such a direction as to bring the planet high in the sky. At other times it is not much higher than the sun—merely farther to the south. So then, about March 9, or for a few days before or after that date, one may look to the southwest and there see Mercury, as a brilliant point of light, in the gathering dusk. At sunset on the 9th, it will be about 16 degrees above the horizon.

23 Times as Bright

Venus is also coming into view. It has not separated as far from the sun as Mercury on the 9th, but as it is now some 23 times as bright, that will help to make it visible. Venus will appear in the dusk, like Mercury, just after sundown, almost directly west. By the end of the month it will be easier to see than earlier in March. Both of these planets set before the sky gets fully dark, and they are not shown on the accompanying maps, which depict the sky for 10:00 p. m. on the first of the month, and an hour earlier on the 15th.

Three bright planets are shown, however. The brightest is Jupiter, of magnitude minus 1.9, which rises about three hours after sunset, and is then visible the rest of the night. It is in the constellation of Virgo close to the star Spica, which is low in the east at the times for which the maps are drawn. Though Spica is of the first magnitude, Jupiter is about 17 times more brilliant.

High in the south, visible through the night until about two hours before sunrise, are the two bright planets whose dance in the constellation of Gemini, the twins, we have been watching through the winter. They are near the stars Castor and Pollux. Saturn is the brightest of this quartet, of magnitude plus 0.2, about 20% brighter than Mars, which is next. Pollux is about two-fifths as bright as Saturn, and Castor is still fainter.

On March 18, Mars, which is moving eastward through the sky, passes Saturn, the second time in two months. It passed it on Jan. 22, while it was moving toward the west. It turned around on Feb. 21. Saturn, which has recently been moving westward in the sky, is stationary and then starts an easterly motion on March 20.

Brightest star of the evening skies in March is Sirius, the dog star, in Canis Major, the great dog, seen in the southwest. It is just to the left of the prominent constellation of Orion, the warrior. Above Sirius is Canis Minor, the lesser dog, with Procyon, just below Gemini, in which Mars and Saturn appear. In the south is Regulus, in Leo, the lion.

High in the west is Taurus, the bull, with first magnitude Aldebaran and to the right of this figure we see Auriga, the charioteer, in which Capella shines. To the east is Spica, already mentioned as near Jupiter, and nearby, to the left, is Boötes, the bear-driver, with Arcturus.

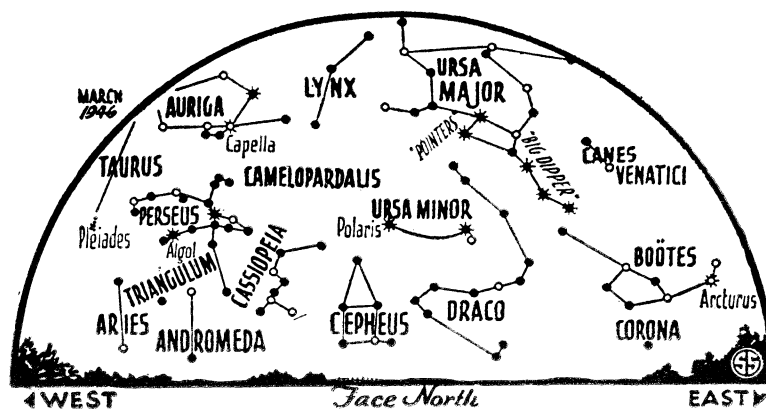
On March 21, at 12:33 a. m., EST, so

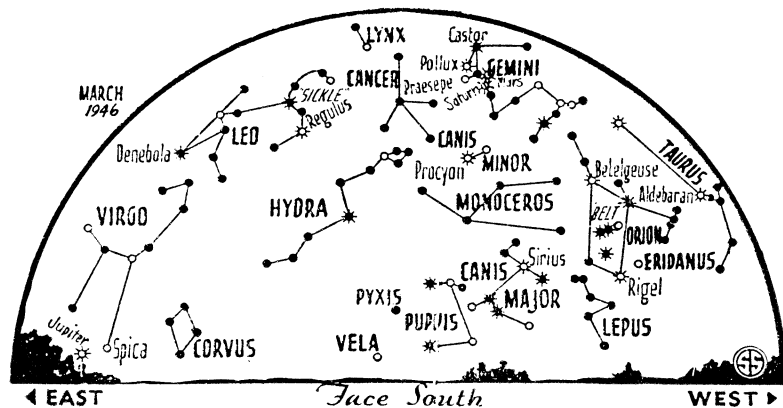
that it happens on the evening of March 20 in central and westerly parts of the country, the sun, which has been traveling northward through the sky since just before Christmas, reaches the half way mark and stands over the equator. This event is called the vernal equinox, the latter part of the name meaning "equal nights." At this equinox, like the corresponding one six months later, the sun rises directly east, sets directly west, so it is above the horizon just half the 24 hours and below for the same time. That is, it would were it not for the refraction of the earth's atmosphere. This effect, which is like that of a prism, makes the sun seem a little higher than it really is, so that we see it before it rises and after it sets for a short time.

Apparent Movement

But, regardless of that, the vernal equinox is one of four main points in the sun's annual movement around the sky. This is a movement that is only apparent, for the effect is really due to the annual movement of the earth around the sun. At different times of year as we encircle it, we find it standing against an ever-changing background so it appears to be the sun that moves. The path the sun seems to take is called the ecliptic, and it runs through the constellations of Pisces, the fishes; Aries, the ram; Taurus, the bull; Gemini, the twins; Cancer, the crab; Leo, the lion; Virgo, the virgin; Libra, the scales; Scorpius, the scorpion; Sagittarius, the archer; Capricornus, the sea goat and Aquarius, the water bearer. The moon and planets also remain close to the ecliptic, so that its path can roughly be traced from the position of the planets.

The ecliptic is inclined to the equator,





✧ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

the line in the sky directly over the earth's equator, so half the ecliptic is in the northern sky and half in the southern. Thus we can get our four main points. Two are the intersections with the equator. These are the equinoxes, where the sun stands about March 21 and Sept. 23. The other two points are the solstices, marking the northernmost and southernmost parts of the ecliptic. The former is where the sun stands on June 21 and the latter where it is on Dec. 22.

As a convenient subdivision of the year, astronomers have long used the passage of the sun through the four quarters of the ecliptic, as marked by the four points mentioned above. These they have called "seasons," and the one between the equinox in March and the solstice in June they call spring. Therefore, in the astronomical sense, spring commences on March 21 at 12:33 a. m., EST.

Of course this is an arbitrary division of the year. People might do it—indeed, they have done it—in other ways. In common speech, for example, we often consider the whole of March, followed by April and May, as spring, and then have summer commencing at the beginning of June. Again, we might call summer the quarter of the year during which it is farthest north, beginning not at the solstice, but half way between the equinox and the solstice, or about May 7, and ending at the mid point between the solstice and the following equinox, or about August 9. Then the June solstice would be the middle, and not the beginning of summer, and we would be following an old practice in England, where June 21 is called "Midsummer day." The events of Shakespeare's "Midsummer Night's Dream" occurred at this time.

However, this practice is not generally used, and the astronomical usage is very

widely followed, with spring commencing with the vernal equinox, and summer with the summer solstice. This usage has the advantage of roughly corresponding with the weather, for there is a lag in the seasons as we do not get our warmest weather when the sun is farthest north, but some weeks later.

It is true, of course, that what has been said applies only to the northern hemisphere. In the southern the seasons are reversed. Their autumn comes at the time of our spring, and their winter with our summer. This was the reason, a few years ago, that the "American Ephemeris," an annual volume of astronomical tables published by the U. S. Naval Observatory, stopped making the statement that, for example, spring would begin on the 21st of March. Now they simply state that the equinox or solstice happens on a certain day at a particular time. The book is used in all parts of the world, and so now its statement is as true in South America as it is at home.

Celestial Time Table for March

March EST	
3	1:01 a. m. New Moon
6	8:00 p. m. Moon nearest, distance 227,900 miles
9	11:00 a. m. Mercury farthest east of sun
10	2:47 a. m. Algol (variable star in Perseus) at minimum
	7:03 a. m. Moon in first quarter
12	5:50 a. m. Moon passes Mars
	8:32 a. m. Moon passes Saturn
	11:37 p. m. Algol at minimum
15	8:26 p. m. Algol at minimum
17	2:11 p. m. Full moon
18	5:15 p. m. Algol at minimum
	8:00 p. m. Mars passes Saturn
19	7:42 p. m. Moon passes Jupiter
21	12:33 a. m. Sun crosses equator, spring commences in northern hemisphere.
22	6:00 p. m. Moon farthest, distance 251,600 miles
25	5:37 p. m. Moon in last quarter

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

Science News Letter, February 23, 1946

Overbaking potatoes causes a loss in their vitamin C.

OCEANOGRAPHY

Surf Forecasters Trained During War

► SURF FORECASTING was placed on the same kind of scientific basis as weather forecasting by scientists at the Scripps Institution of Oceanography at La Jolla, Calif., and during the war 200 Navy and Marine Corps officers were trained in the new technique, for use in connection with landing operations.

The work was carried on under the immediate supervision of Dr. Harald U. Sverdrup, director of the Institution, with the cooperation of other members of the staff.

"It has been possible to establish a relationship between, on the one hand, higher waves," said Dr. Sverdrup, "and on the other, the wind velocity and the stretch of water over which the wind has been blowing (the fetch) or the length of time the wind has been blowing (the duration).

"The formulation of these relationships, which was accomplished in the summer of 1943, represents the greatest single accomplishment of the project."

Scientific data accumulated during the long studies have been incorporated in two volumes, published by the Hydrographic Office of the Navy.

Science News Letter, February 23, 1946

The *maté tree* or shrub, that supplies perhaps 25,000,000 people with their customary beverage, is a species of the holly.

Tobacco crops in the United States will total for 1945 over 2,000,000,000 pounds, a 4% increase over 1944.

Weather ships are vessels stationed at intervals across the ocean carrying U. S. Weather Bureau observers and instruments; radio reports from them assist in the making of weather forecasts.

THE SCIENTIST IN ACTION by **W. H. GEORGE**

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