

ASTRONOMY

April Evening Skies

Two Planets and Ten Bright Stars Adorn Sky; Mars Apparently to Change Direction and Move Eastward

By JAMES STOKLEY

WITH THE COMING of April the springtime constellations, which during the last few months have been rising in the eastern evening sky, are in a position high overhead. Low in the southwest still appears Sirius, the dog star, marking Canis Major, and almost directly west is the belt and upper star—Betelgeuse—of Orion, all that now remains visible of that conspicuous winter constellation. Taurus is a little farther north, and is marked by Aldebaran; above it, and just to the right, is Auriga, with Capella as its brightest star.

But these constellations will soon disappear from the evening sky until next winter, so let us turn to the bodies that are now overhead in all their glory. High in the south is Leo, the lion, which can always be identified by the "Sickle." This implement now hangs with the curved blade pointing to the southwestern horizon. The handle hangs downward, and at its end is a first magnitude star, Regulus.

Poor Resemblance

The sickle is supposed to represent the lion's forefeet and head, but don't think your eyesight is failing if you cannot see the resemblance. No one else can, either! The ancients who gave the constellations their familiar names must have had considerably more active imaginations than we. But, in any event, the hind quarters of the lion are represented by a triangle of stars to the west of the sickle. The westernmost star in the triangle is Denebola, otherwise known as beta Leonis, because it is the second brightest star in the constellation. It is not of the first magnitude, but of the second.

Just at present Leo is enriched by the presence of an even more brilliant body than either of these stars. To the west of Regulus is an object shining with a steady light that readily distinguishes it from the stars. This is the planet Jupiter, largest member of the solar system of bodies, like the earth, revolving

around the sun, which is a star just like the far more distant ones that dot the night sky. Jupiter's mean diameter is 86,728 miles, nearly eleven times that of the earth, but just about a tenth the sun's.

Leo's next door neighbor, towards the southeast, is the constellation of Virgo, the virgin, marked by the bright star Spica. Like Leo, Virgo is also the hostess of a planet, which is Mars, famous for its reddish color. Though Mars is appreciably fainter than Jupiter, and is decreasing slowly in brilliance, it is brighter than any star in the vicinity; so the two planets form prominent additions to the evening sky.

All Are Moving

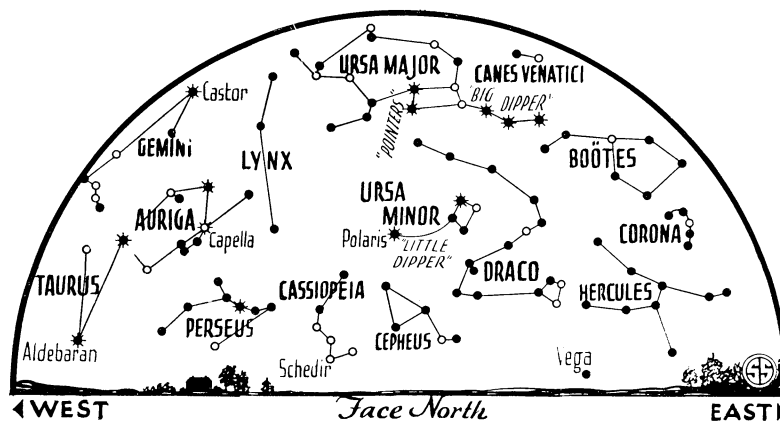
The stars and the planets are all in motion. The latter are revolving around the sun at the same time that the sun itself is moving through space, so their actual motion, with respect to the distant stars, is a helical one like the turns of a corkscrew or the miscalled "spiral" staircase. But the stars are at such vastly greater distances than the planets that their motions are, in most cases, not apparent to the naked eye in the course of a life time. For centuries the constellation figures remain unchanged.

The planets, because of their proximity, are continually moving among the stars, and if you watch the sky from night to night, taking notice of the relation of one of the planets to the nearby stars, you can soon see the motion. With the more distant ones, like Jupiter and Saturn, it might take several weeks before the motion could be detected without instrumental aid, but that is a short time compared to the time needed to see the movements of the stars—what is called their "proper motions."

Planets Follow Sun

Ordinarily the planets move eastward through the sky, as does the sun in its annual motion which takes it completely around in a year. But if you have been watching Mars of late, you would have found that it is going westward. During the early days of April it will be seen to be moving much more slowly than it has been, and on Thursday, the thirteenth, it will stand still for a short time. After that, if your observations were to continue, you would find that the planet is moving eastward. Then its motion would be said to be "direct," at present it is "retrograde."

The reason for this change in the direction of a planet's motion is that we are observing it from a moving platform—the earth. Possibly you have some time had the experience of being on a moving railroad train and passing a slower moving train. You may have



WELL-PLACED FOR OBSERVATION

Though it contains no first magnitude stars, the Big Dipper is probably our best known constellation. Its present position in the sky, high above the horizon, makes it easily observed, even through the glare of city lights.

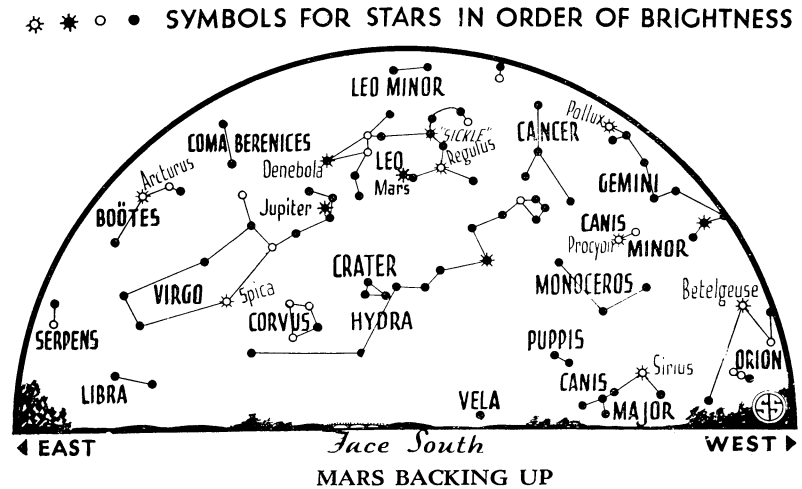
thought that the latter was going backwards until by looking down at its wheels you could tell that it, too, was travelling along at a pretty good clip. The reason for this is that your own motion was not immediately apparent. When compared to you, the other train seemed moving backwards, though it was not when compared to the ground. Exactly the same thing is true of the earth and Mars. Because the earth's orbit is smaller than Mars', we are moving more rapidly, and we regularly pass that body. Since the twenty-second of January we have been overtaking him, and as we have watched him from our smoothly running celestial train, he seemed to be creeping backwards. On the thirteenth of the month, we have passed around the curve, and are starting back to move directly away from him, and for the same reason his light is now decreasing. As we move on around to the other side of the sun from Mars, he will continue to move eastward, until we again catch up to him.

Several first magnitude stars in addition to those already mentioned are now visible in the evening. Directly west, about half way from the horizon to the zenith at ten o'clock at the beginning of the month, or nine o'clock on the fifteenth, is the constellation of Gemini, the twins. They are Castor and Pollux, but only Pollux is of the first magnitude. His brother is a little fainter. They are side by side, and Pollux is to the south or to the left. Another first magnitude star can be located if you follow a line from the twins to Sirius, low in the southwest. A little less than half way is the lesser dog, Canis Minor, with Procyon to mark it.

The other first magnitude stars are in the eastern sky. To the left of Virgo is Bootes, in which we find brilliant Arcturus. Low in the northeast, where it will gradually mount higher and higher night after night, is Vega, marking the first appearance this spring of Lyra.

Best Known

There is one constellation that is now particularly well placed for observation, and is probably the best known of all, though, curiously enough, it contains no first magnitude stars. This is the Great Bear, Ursa Major, of which the Big Dipper is the most familiar part. The dipper is now in the northern sky, almost overhead. The handle points to the eastern horizon; at the opposite side of the bowl are the two "pointers." If you follow an imaginary line



This is apparently what the neighboring planet has been doing since January 22. But on April 13 Mars will resume direct motion.

from these, you will come to the pole star, Polaris, which is almost directly above the north pole of the earth.

The "Big Dipper" is an American designation for these seven stars. In England they are called either "the Plough," or "Charles' Wain." The latter is cognate with the modern German name for them, "Wagen." The French usually call it "Chariot," but in the south of France, it is given a name similar to ours. They call it the "Casse-rolle," or saucepan.

Each of the stars in the dipper has its own name. Starting from the end of the handle, and ending at the pointers, they are Benetnasch, Mizar (close to which is a fainter star called Alcor), Alioth, Megrez, Phad, Merak and Dubhe, the latter being the pointer nearer the pole.

Dipper Tells Time

In addition to indicating the north, the dipper can also be used for telling time. This is nothing new, for in the second act of the first part of Henry IV, Shakespeare has a carrier in the Inn-yard say "An't be not four by the day I'll be hanged: Charles' Wain is over the new chimney."

Before the days of clocks, when sundials were the principal time pieces, a device called a "nocturnal" was used to tell the time at night, by the position of the pointers. A few years ago, exactly the same device was issued as a novelty, but it is easy to find the time from the pointers without any instrumental aid. One rule for doing it is as follows:

Read the apparent time from the

stars, considering the pole star as the center of the dial, and the pointers as the hour hand. The figure twelve is supposed to be directly above the pole. The indicated time can easily be read to the nearest quarter hour. Now add to this the number of months that have elapsed since January first, to the nearest quarter month. Double this figure. Then subtract the result from $16\frac{1}{4}$, or from $40\frac{1}{4}$, if the result is greater than the former figure. The answer is the time in hours p. m., so if it is greater than 12, subtract 12, and you have the time in hours a. m.

An Example

Let us try an example of this. In an evening this month, the pointers are in the position of 1:00 o'clock. Three and a half months have passed since the beginning of the year, which, added, makes $4\frac{1}{2}$. Double this is 9, which, subtracted from $16\frac{1}{4}$, is $7\frac{1}{4}$, so the time is 7:15 p. m.

During April the moon goes through its phases as follows: It is at first quarter on the third, full on the tenth, at last quarter on the 16th and new on the 24th. Thus, there will be bright moonlight evenings from the beginning of the month to about the thirteenth, and again in the last few days of the month. The moon passes Mars on the sixth, and Jupiter the next day. On the 18th, it passes Saturn which is to be seen in the early morning sky. Mercury will also be seen in the east before sunrise about the 20th, but it will only be visible close to the horizon. Venus is close to the sun this month, and will not be seen at all.