

ASTRONOMY

Mars Draws Near

The three planets, Mars, Jupiter and Saturn, in addition to many first-magnitude stars, will be evident in the September evening sky.

By JAMES STOKLEY

► **STEADILY DRAWING** closer to the earth, the red planet Mars is becoming increasingly conspicuous in the evening sky. About 69,700,000 miles away at the first of September, it will move in to a distance of 55,400,000 miles by the end of the month. At the same time it will increase in brightness about 75%, reaching magnitude minus 1.1 on the astronomical scale by Sept. 30.

The position of Mars, which is in the constellation of Taurus, the bull, is shown on the accompanying maps. These depict the sky as it appears about 10 p.m., your own kind of standard time (add one hour for daylight saving) on Sept. 1; an hour earlier at the middle of the month, and two hours earlier at the close. The red color of Mars, and the fact that it is brighter than any other planet or any star visible at the same time, make it easy to identify.

Earlier in the evening, however, Jupiter is also seen, and is even brighter. It is in Virgo, the virgin, and sets before the times for which our maps are prepared: at about nine o'clock at the first of September. By the end of the month it will descend below the horizon so soon after the sun that you will not be able to see it at all.

Saturn is shown in Ophiuchus, the serpent-bearer, low in the southwest. Of magnitude 0.7, it is about a third as bright as Mars is, at the beginning of September.

Turning to the stars that are seen these evenings, the brightest is Vega, in Lyra, the lyre, high in the west. A little to the east of this group you will see Cygnus, the swan, in which the star Deneb shines. Toward the south is Altair, in Aquila, the eagle. These three bright stars, all of the first magnitude, form what is sometimes called the summer triangle, because it is so conspicuous on summer evenings.

Three other first-magnitude stars are also shown. All of them are now quite low in the sky, where the increased absorption of their light by the atmosphere causes them to appear rather fainter than they should.

Low in the northeast, to the left of Mars, you will find Capella, in Auriga, the charioteer. In the northwest is Arcturus, in Boötes, the bear-driver. And in the south there stands Fomalhaut, in Piscis Austrinus, the southern fish.

Early Rising Planet

In the early morning the planet Venus appears in the east. It rises about an hour and a half ahead of the sun at the beginning of September, an hour at the end. About the ninth Venus will be joined by Mercury, innermost of all the planets, which

will then be farthest west of the sun. By the time it appears, dawn will have started, and the sky will no longer be completely dark.

On the evening of September 4, when neither will be visible in this part of the world, Mercury will pass to the south of Venus; the following morning they will still be close together. On the 18th, as Mercury draws back toward the sun, it will again pass Venus, about 1:00 a.m., but by then Mercury will be hard to see. The moon, then a narrow waning crescent, will pass both of the planets early in the morning of Sept. 12. And on the morning of the tenth Mercury can be seen passing very close to the star Regulus, which is in Leo, the lion, and is of the first magnitude. The approach will appear so close that the pair will look like one star to the naked eye, but a pair of binoculars will show them to be separate.

Autumn Arrives

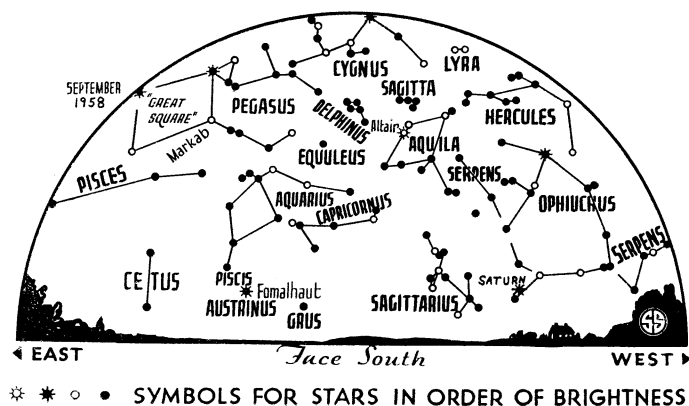
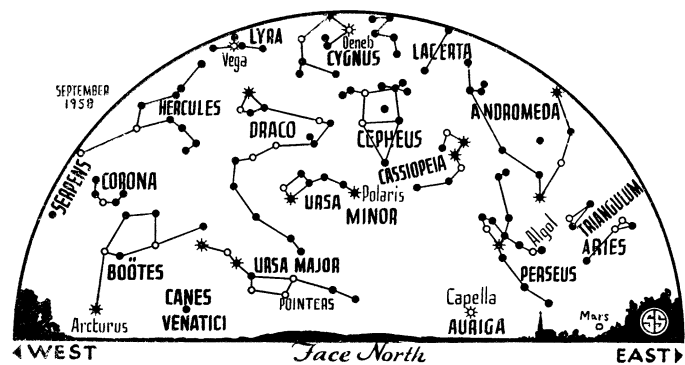
Another important event on the astronomical program for September will occur at 8:10 a.m., E.S.T., on the 23rd. This is the equinox, the time when the sun, which has been moving southward since last June,

reaches the halfway point. It will then be standing directly over the equator, above a point a thousand miles south of Dakar, in French West Africa. In the Northern Hemisphere this will be the official beginning of autumn, while spring will then commence in countries of the Southern Hemisphere.

A few days after this the moon will be full, on Sept. 27. This will be the "harvest moon." The peculiarity of this moon is that there is only a small difference in time in moonrise for several nights in succession. In September, this retarded rising is only half an hour, compared to about an hour and a quarter in March. Bright moonlight for a number of nights in succession is supposed to help the farmer to bring in his harvest.

Destination: Lyra

Lyra, which shines high overhead these evenings, has a number of points of interest. The entire solar system, the sun and all the planets, is moving through space toward Lyra at a speed of about 12 miles per second. The earth's distance to Vega, in Lyra, is about 23 light years; that is, 23 times the six trillion miles that a ray of light, traveling 186,000 miles each second, will cover in a year. This distance is lessening at the rate of more than 20 miles per second. Not only is the earth approaching Lyra, but Vega itself is moving towards our part of the sky at about 8.5 miles per second; fortunately,



☆ * ○ ● SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

it is not so accurately aimed that there is any possibility of it ever hitting us.

The second brightest star in Lyra, Sheliak, or beta Lyrae, is the one shown on the southern sky map just above the R in the name "Lyra." As discovered in 1784 by John Goodricke, a 20-year-old deaf mute and amateur astronomer in England, Sheliak is a variable star. Ordinarily of magnitude 3.4, or slightly fainter than gamma Lyrae, the star just to the left, every 12.9 days it drops to about 4.5, about 2.75 times as faint.

Double Star

Actually there are two stars, very close together. One is relatively bright, and large, about 20 or more times the diameter of the sun. The other is smaller and fainter. Once in each 12.9-day cycle, the darker star passes directly in front of the brighter one, and the partial eclipse causes the reduction in brightness. Half way between these eclipses there is a lesser eclipse, as the bright star hides the faint one. This causes a smaller reduction in light.

Surrounding the pair there is a huge shell of gas, mainly hydrogen. This seems to originate in two streams that squirt out from each star, toward the other. The streams do not hit the other stars, however, because of their movement around the center of gravity of the system.

There is a marked difference in color of the two stars. The large bright one is bluish, while the other is yellow-white. It would be most interesting to observe the system from a closer position.

Actually, what is known about beta Lyrae has been learned from studies of its spectrum, the band of color, crossed by dark lines, which is produced when its light is analyzed by a spectroscope, attached to a large telescope. The spectrum undergoes sudden and curious changes. Astronomers have worked out the hypothetical structure described above as an explanation. There are still some very puzzling features, and Sheliak continues to be the subject of much astronomical research.

Celestial Time Table for September

Sept.	EST	
2	6:00 a.m.	Moon farthest, distance 251,900 miles.
4	3:56 p.m.	Moon passes Mars.
	9:00 p.m.	Mercury passes Venus.
6	5:24 a.m.	Moon in last quarter.
9	4:00 a.m.	Mercury farthest west of sun; visible low in east just before sunrise for a few days around this date.
12	4:03 a.m.	Moon passes Mercury.
	7:36 a.m.	Moon passes Venus.
13	7:02 a.m.	New moon.
14	noon	Moon nearest, distance 223,400 miles.
16	1:37 a.m.	Moon passes Jupiter.
18	1:00 a.m.	Mercury passes Venus.
19	9:33 a.m.	Moon passes Saturn.
	10:17 p.m.	Moon in first quarter.
23	8:10 a.m.	Sun over equator, autumn commences in Northern Hemisphere.
27	4:43 p.m.	Full moon—Harvest Moon.
29	5:00 p.m.	Moon farthest, distance 252,400 miles.

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

Science News Letter, August 23, 1958

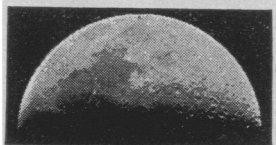
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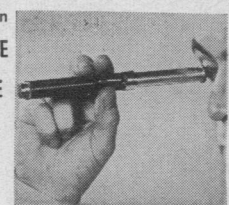
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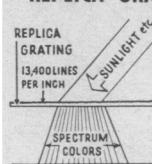
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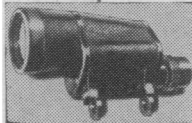
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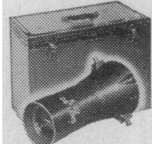


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