

ASTRONOMY

# Bright Stars Overhead

September finds planets missing from the evening sky. Mars and Saturn appear an hour after midnight while Jupiter rises only a few hours before the sun.

By JAMES STOKLEY

► FOR THE first time in many months, there are no planets in the evening sky in September but, of course, the stars are with us. Brightest of them all is Vega, in Lyra, the lyre, which is high in the west. Directly overhead is Deneb, at the top (the northern end) of the cross-shaped group of Cygnus, the swan. And below Cygnus, toward the south, is Altair in Aquila, the eagle. These three stars—Vega, Deneb and Altair—form a large triangle which is a good group to know, since it can help you find other stars as well.

There are three other stars of the astronomer's first magnitude which are shown on the accompanying maps. (These give the appearance of the skies at about 11:00 p.m. war time, on September 1, an hour earlier at the middle, and two hours earlier at the end of the month.) Arcturus, in Bootes, is low in the northwest. One way of finding it is to look for the familiar great dipper, low in the north. Then follow the curved line of the dipper's handle to the left and you come to Arcturus.

In the northeast is Capella, in Auriga, the charioteer. Later in the evening, or at the same time later in the season, this star rises higher, and it is conspicuous on winter evenings. Thus its appearance serves as a token of the coming of the cold time of year. The other first magnitude star is in the south. Its name is Fomalhaut and it is part of the constellation of Piscis Austrinus, the southern fish, which is one of the most southerly groups visible from the United States.

## Great Dipper

The great dipper, part of Ursa Major, the great bear, not only indicates the direction of Arcturus. Even better known in this figure are the two pointers, the two stars in the bowl of the dipper farthest from the handle. They point, upwards at this time of year, to the pole star, Polaris. Directly above the dipper is a long curved line of rather faint stars forming Draco, the dragon,

which winds his sinuous form around the pole. To the right of Polaris is Cassiopeia, the queen, shaped like a W, now on its side. She, in mythology, was a queen of ancient Ethiopia, and her king, Cepheus, is nearby, above and to the left, between her and Cygnus.

Low in the sky to the southwest is the group of Sagittarius, the archer, of which a few stars are shaped to form a miniature dipper, sometimes called the milk dipper, perhaps because it is in the heart of the milky way that now arches high across the heavens. This is one of the zodiacal constellations through which the sun and planets seem to move. Another is Aquarius, the water carrier, just above Fomalhaut.

## Planets After Midnight

If you want to see planets this month, you can—after midnight. About 1:00 o'clock the constellation of Taurus appears in the east. In it—as well as the bright star Aldebaran—are Mars and Saturn. Mars, red in color, is the brighter. Jupiter is in Cancer, the crab, and rises about three hours before the sun. Venus, which has been so brilliant in the evening sky during recent months, is in line with the sun on Sept. 5. By the end of September, it will have moved far enough to the west of the sun that it will be visible in the east at daylight, far outshining any other star or planet.

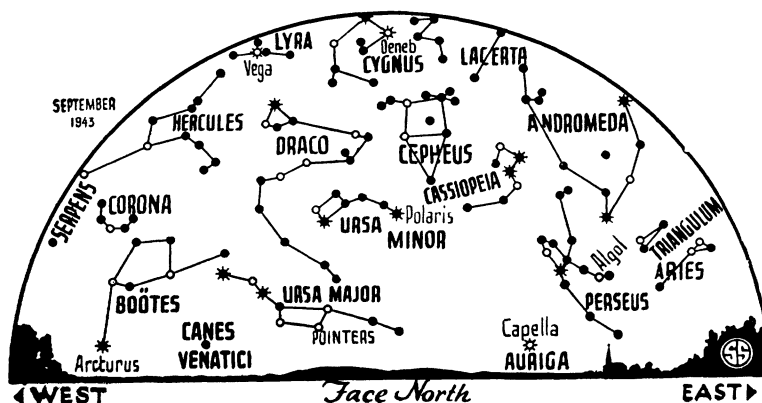
Just as one may look with interest toward the center of the city in which

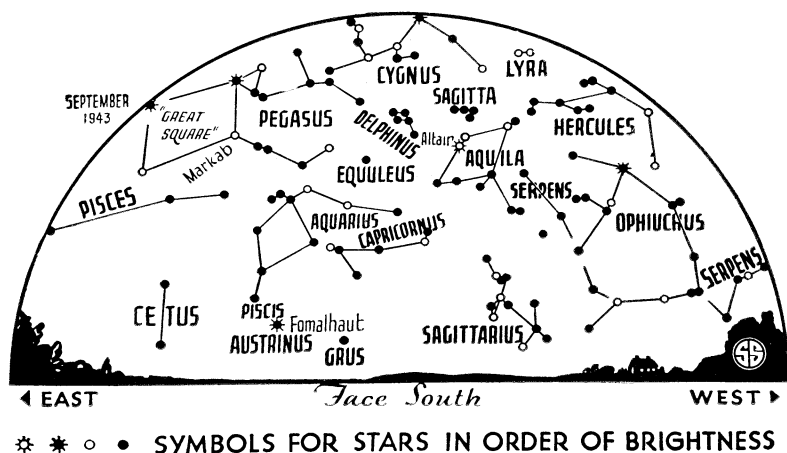
we live, so may we look to the center of the stellar city—the Galaxy—of which the sun and all the other stars that we can see in the nighttime sky are part. This makes Sagittarius more of significance to us than some other parts of the sky, because it is toward that figure, at a distance of some 30,000 light years, or about 180 quadrillion (180 followed by 15 ciphers) miles, where lies the center of the grindstone-shaped system of stars that make up the galaxy.

## Our Galaxy

Since this system is something like 100,000 light years in diameter, it means that we are about three-fifths of the way from the center to the edge, not actually on the outskirts, but toward the suburbs at least. And since this system includes about 100,000,000,000 stars, with our sun rather less than average in size and brightness, it shows how relatively unimportant we are from a cosmic viewpoint.

Just below the figure of Lyra, in which Vega shines, is the constellation of Hercules, the champion, and that also has a point of special interest, because that is where we're going. The sun, and the rest of the solar system with it, is moving toward that part of the universe at a speed of about 12 miles a second. Since the earth is going around the sun, and at the same time the sun is moving through space, it means that our path is not really a circle, but a helix, like that of a man climbing a "spiral" stairway. Of course, this fact is well known to astronomers—so well, in fact, that they seldom bother to mention it. Occasionally someone happens to





“discover” it and, because some astronomical book may fail to describe it, he thinks that he has made a great contribution to knowledge.

The actual discovery of this movement of the solar system through space goes back about 150 years, to the English astronomer, Sir William Herschel. In studying the movements of the stars in the sky, he found that those in one direction were predominantly moving apart. Those in the opposite direction seemed all to be coming together. He realized that this was an effect of the earth's own movement. As we get nearer to some stars they apparently diverge. You can imagine a similar effect if you are motoring along a road that goes through a forest. If you pick out two trees ahead of you and watch them, they seem to draw apart until you are between them—then, as you leave them behind, they come together again. Since the center from which the stars diverge

is in the direction of Hercules, it shows that we are going that way. This is confirmed by other observations. The spectroscope, for example, tells whether the distance between us and a particular star is getting greater or less. Those toward Hercules show a predominance of approaching motions, those in the opposite direction tend to be moving away.

**Celestial Time Table for September**

Sept.	EWT	PHENOMENON
5	8:00 p.m.	Venus in line with sun.
7	8:33 a.m.	Moon in first quarter.
12	1:00 p.m.	Moon nearest; distance 223,900 miles.
13	11:40 p.m.	Full moon.
19	11:08 p.m.	Moon passes Mars.
21	12:47 a.m.	Moon passes Saturn.
	3:06 a.m.	Moon in last quarter.
23	6:12 p.m.	Sun crosses equator — autumn commences (Autumnal Equinox).
24	4:00 p.m.	Moon farthest; distance 251,800 miles.
25	10:23 a.m.	Moon passes Jupiter.
26	12:15 p.m.	Moon passes Venus.
29	7:29 a.m.	New moon.

Subtract one hour for CWT, two hours for MWT, and three for PWT.  
*Science News Letter, August 28, 1943*

**PUBLIC HEALTH**

# Youngsters Immunized

Survey shows the majority of children have been vaccinated at some time against diphtheria and smallpox but few against scarlet and typhoid fever.

► A MAJORITY of youngsters are now immunized at some time against diphtheria and smallpox but scarlet and typhoid fever vaccinations, in comparison, are still negligible, a representative study of cities of 100,000 population or over reveals.

In a survey reported by Selwyn D. Collins, head statistician, and Clara Councell, associate statistician, of the

U. S. Public Health Service, a canvass of 213,931 households was made in 28 cities to learn the extent of immunization.

By the time children are eight years old 61% have been immunized against diphtheria as compared with 85% protected against smallpox. For the older children the percentage immunized against diphtheria declines, but for

smallpox it increases until the score sheet for 14-year-olds shows 90%.

For diphtheria immunization of two- and three-year-olds, which is especially important, the intermediate cities carried off top honors with 34% and 43% while the Western cities averaged only 14% and 19% for the two age groups. In these early preschool ages the South, which was lowest in most school ages, was higher than the Northeast and almost as high as the North Central—the highest sections for practically all school ages.

For smallpox the Northeast, intermediate cities, and the South all show above 90% vaccinations by the time children are eight years of age. The North Central and particularly the West are low. In the number of smallpox cases reported in the survey, the West is above any other section.

Evidence indicates that the level of diphtheria immunization has increased considerably since the survey was made, the researchers report, but the level of smallpox vaccination has probably little changed.

“The percentages of children who had been immunized against scarlet fever were too small in every region,” the report states, “to have much effect upon the prevalence of the disease.”

Immunizations did not get above five per cent for any age, although the North Central area and intermediate cities show the best record.

Typhoid vaccinations are even fewer; peak groups hardly top two per cent in any of the Northeast, North Central or intermediate cities. The maximum in the West was five per cent, while the

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