

ASTRONOMY

Ringed Planet Prominent

Saturn and star Spica are two bright celestial objects in May. Stars in the familiar Great Dipper are named by a three-century-old custom, an exception to the usual system.

By JAMES STOKLEY

► HIGH IN the south these May evenings two bright celestial objects may be seen. One is the star Spica in Virgo, the virgin, while just above it, and about 75% brighter, is the planet Saturn, famous for its system of rings which a telescope is needed to reveal.

Both the star, which shines by its own light, and the planet, which reflects to us the light of the sun, are shown on the accompanying maps. These indicate the positions of the stars at about 10 p.m., your own kind of standard time, at the first of May, and about nine o'clock at the middle. (Add one hour if you are on daylight time.)

Saturn is the only planet shown. The rest are stars, presenting their typical spring-time aspect. High in the north, at about its best evening position of the year, we see the Great Dipper, actually part of Ursa Major, the great bear.

The dipper is upside down, with the pointers, two stars in the bowl of the dipper, toward the left. Following their line downwards we come to Polaris, the pole star, which is at the end of the handle of the little dipper, part of Ursa Minor, the little bear.

Guide to Other Stars

By following around to the south the curved line of the handle of the big dipper, we are easily led to the bright star Arcturus, in Bootes, the bear-driver. Continuing still farther we come to Spica, near which Saturn stands, and then to the little constellation of Corvus, the crow, four stars arranged in the shape of a mainsail.

To the right of Virgo is the lion, Leo, in which there is a sub-group known as the sickle. Regulus is at the end of the handle, which points downwards, while the blade is directed toward the southwest. As a lion, the blade forms the head, while Denebola, a bright star to the left, is part of its tail.

Toward the west appear all that remain of the brilliant constellations of the winter evening sky. There are the twins, Gemini, with Castor and Pollux, the latter of the first magnitude. Lower, and to the right, is Auriga, the charioteer, with Capella, normally brilliant but now somewhat dimmed by reason of its lowness in the sky. And to the left is Procyon, in Canis Minor, the lesser dog.

Looking toward the east we find some of the stars that will shine brightly in summer

evenings just making their debut. In the southeast there is Scorpius, the scorpion, with the stars Antares coming into view. Farther north is Cygnus, the swan, with Deneb, while above this bird is Lyra, the lyre, with brilliant Vega, brightest star of summer evenings.

As for the other planets, Mars set so soon after the sun that it is not easily visible. Jupiter is directly beyond the sun on May 24, and being so nearly in line with that body cannot now be seen. Mercury also is too near the sun for us to see, but Venus now shines brilliantly in the morning sky, visible low in the east before sunrise. On May 19, it is at greatest brilliance, as conspicuous before dawn as it was in the western evening sky in early March.

Most Familiar Constellation

Of all the stars in the sky, probably none are more familiar than the seven shining in the northern sky that form the Great Dipper. To the astronomer these are designated by the system introduced more than three centuries ago by a German astronomer named Bayer.

In his famous star atlas he used Greek letters for the stars in a constellation, usually in order of brightness. Thus the brightest would be alpha, the next beta, and so on. But he made some exceptions to this rule and one involved the Great Dipper. Doubtless because of the familiarity of this group, he started with the pointers, calling them alpha and beta and extending around the bowl and to the end of the handle.

According to this system, the pointer nearer the pole is alpha Ursae Majoris, the Greek letter being followed by the Latin name of the constellation (in the genitive

case). Beta Ursae Majoris is the other pointer, and so on through gamma, delta, epsilon and zeta to eta, the last.

But, in addition, these stars have other names which are not often used. Few people, even few astronomers, know these without looking them up, but starting with alpha they are: Dubhe, Merak, Phad, Megrez, Alioth, Mizar and Benetnasch. Close to Mizar there is a fainter star, which can be seen with the naked eye without great difficulty, which also has a proper name—Alcor. All of these names, like many of the star designations, are derived from the Arabic.

Star Groupings Accidental

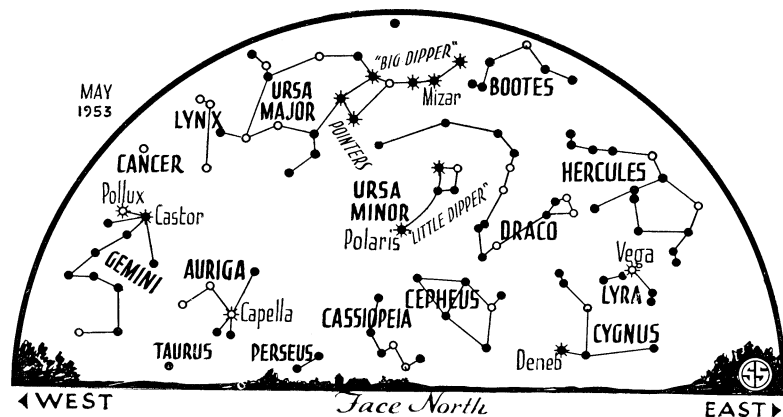
It is seldom realized that the star groupings are quite accidental, depending on the direction from which we look at them. That is, two stars which we see as very close in the sky may actually be a vast distance apart, but lined up so that from this part of the universe we see them together.

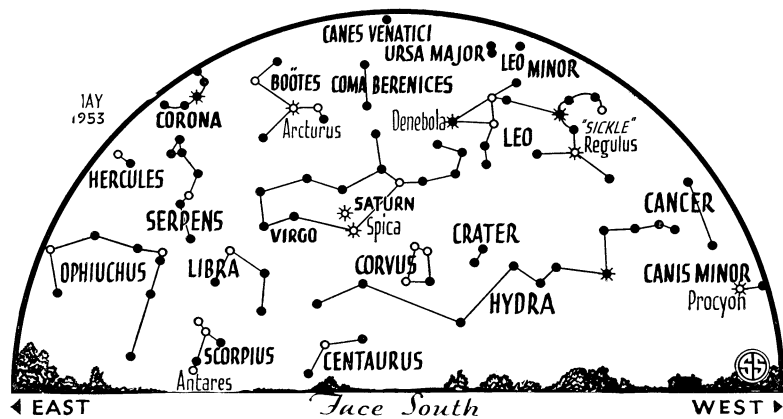
From a planet moving around some distant star, the star groupings would be entirely different from those which we observe.

In the dipper it happens that Dubhe and Phad are at roughly the same distance from us. The former is 91 light years away (a light year being the distance, about 6,000,000,000,000 miles, that light travels in a year), while Phad's distance is 93 light years. Benetnasch is more than twice as far, at 217 light years, while Alioth is only 49 light years distant. The remaining three, Megrez, Merak and Mizar, are, respectively, at distances of 65, 72 and 78 light years.

But even from our part of the universe this star figure, like the others, is not permanent, for the stars are moving. Astronomers resolve such star motions into two components.

One called "proper motion" is that at right angles to a line from the star to the earth, and it is this that changes the place





◊ * ○ ○ SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

of a star in the sky. The other component is called "radical velocity," and that measures the movement of a star toward or away from us. It happens that the radical velocities of all the dipper stars are not very different. They are all moving toward us, at speeds varying from 5.3 miles per second for Dubhe to 7.5 miles per second for Megrez.

However, their proper motions are quite different. Dubhe and Benetnasch, the stars at both ends of the grouping are moving westward, while the others are going eastward together. Thus it just happens that they are passing the other two at the present to give the dipper figure. Fifty thousand years from now, just as that many years ago, the group will look very different from its present appearance.

Story of Mythology

The stars themselves also vary considerably. Alioth, the brightest, is nearly five times as brilliant as Megrez, the faintest.

The spectroscope, which analyzes a star's light, shows that Dubhe belongs to spectral class G, of which our sun is a member. These are stars of rather yellow color. Benetnasch is type B, like Spica, in Virgo, and the stars seen in the wintertime in the belt of Orion. These are blue stars, with large amounts of helium and hydrogen in their atmospheres.

The other five—which are moving along together—are all of type A, like Sirius. Hydrogen is prominent in their atmospheres, and they are blue in color.

Such is some of the scientific information which astronomers have learned about these stars, but mythology also has a story about them. Greek legend relates that the beautiful nymph Callisto, daughter of Lycaon, the king of Arcadia, made Juno jealous of her. Jupiter therefore turned Callisto into a bear, thinking that it would protect her from injury. But Juno found out what had been done and persuaded Diana, the famous huntress, to slay the bear.

Then Jupiter placed her in the sky, as the constellation of Ursa Major, where she has been safe ever since. Later, the legend

continues, Callisto's son, Arcas, was also placed in the sky, as the constellation of Ursa Minor. But even this did not satisfy Juno, so she induced Tehtys and Oceanus to prevent the bears from ever descending into the ocean, like the other stars.

Therefore they are among the circumpolar constellations, those that are so close to the north celestial pole, the center around which all the stars turn daily, that from these latitudes they never go below the horizon.

Celestial Time Table for May

May EST	
9 12:00 mnt.	Moon nearest, distance 227,200 miles.
10 2:14 p.m.	Moon passes Venus.
13 12:06 a.m.	New moon.
14 6:13 a.m.	Moon passes Mars.
19 1:00 a.m.	Venus at greatest brilliancy.
20 1:20 p.m.	Moon in first quarter.
21 9:00 p.m.	Moon farthest, distance 251,200 miles.
24 11:00 p.m.	Jupiter beyond sun.
25 3:32 a.m.	Moon passes Saturn.
28 12:03 p.m.	Full moon.

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

Science News Letter, April 25, 1953

MEDICINE

Electricity on Chest Starts Hearts Beating

➤ HEARTS THAT stop can be made to beat again by an electric current across the chest.

Success with this electric stimulation method in one case, with the electric impulse acting as the sole "pacemaker" of the heart for five days when it resumed beating on its own, was reported at the meeting of the American Heart Association in Atlantic City, N. J.

Besides this life-saving role, the electric stimulation experiments are expected to give doctors new knowledge about disturbances in heart rhythm. The experiments were reported by Drs. Paul M. Zoll, Leona R. Norman and Arthur J. Linenthal of Boston.

Science News Letter, April 25, 1953

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