ASTRONOMY

Stories in October Skies

How Perseus Rescued Andromeda from the Sea Monster And how Orpheus Charmed Eurydice and Became a Swan

By JAMES STOKLEY

SIX brilliant stars, all of the first magnitude, and the planet Saturn, equally bright, are to be seen in the evening sky in October. Most brilliant of the stars now visible is Vega, in the constellation of Lyra, the lyre with which Orpheus charmed the nymph Eurydice, according to the mythological story. High in the western sky, its bluish-white light leaves no doubt of its identity. Indeed, of all the stars in the sky, that are visible from these latitudes, only two exceed Vega in brightness. One, of course, is our own sun, which is a star just like those that shine in the evening sky, except that it is far closer. The other is Sirius, the dog-star, visible during the winter.

Directly above Vega is the constellation of Cygnus, in which is the star Deneb, white in color, and considerably fainter than its neighbor. Frequently Cygnus is called "the Northern Cross," and this figure is now easily seen, for the cross is upright in the sky, with Deneb at the top. Though not as bright as its counterpart, the Southern Cross, which can only be seen from southern countries, the northern one is a more perfect cross. The Southern Cross consists only of four bright stars, marking the cross' extremities, but the one that we can see this month has an additional star at the intersection.

Legends Vary

The name Cygnus, however, really means "the swan," and the legends about it vary. One story has it that this is Orpheus himself, who was changed to a swan at his death and was appropriately placed in the sky near his beloved harp. But another legend makes it the swan into which Jupiter changed himself when he visited Leda, queen of Sparta. It is more easy to recognize the swan than some of the other constellation figures. Deneb marks the tail, and the arms of the cross the open wings. The foot of the cross is the swan's long neck, outstretched as he flies through the air. The star at the swan's head is called Albireo, but though it is bright, it is not quite of the first magnitude.

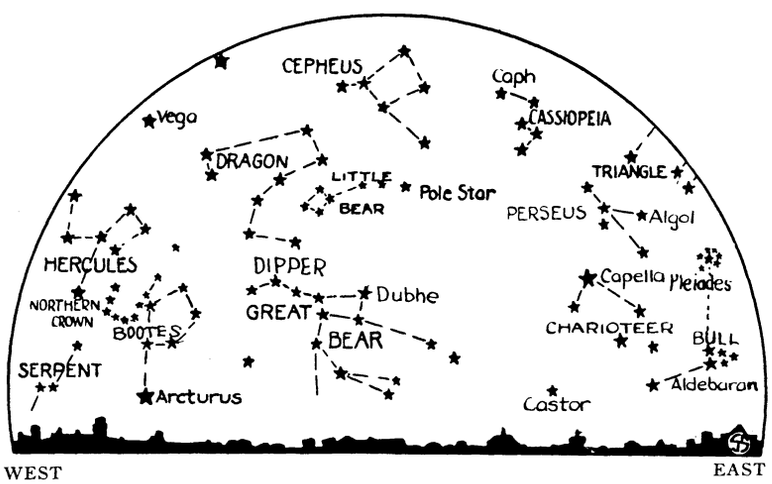
A little to the south of Lyra, and about as high above the horizon, can be seen another brilliant star, Altair, which marks the constellation of Aquila, the eagle. In this case it is rather hard to see any resemblance between the bird and the group of stars. With Vega and Deneb, Altair forms an isosceles triangle, a convenient guide from which to locate other stars. Mythologically, Aquila represents the eagle that bore aloft to the sky Ganymede, the cupbearer of the gods.

Turning to the southern sky, we can see another figure which, while not made of first magnitude stars, is also a useful guide for constellation study. This is the great square in Pegasus, high in the south, the stars marking the corners being of nearly similar brightness. As a matter of fact, only three of the stars are in the constellation of Pegasus, which also includes the stars to the right of the square. These represent, inverted, the head and forefeet of the famous winged horse that sprang from the blood of the Medusa, after she had been decapitated by Perseus. The star in the northeastern corner of the square is called Alpheratz, and is in the constellation of Andromeda, the lady who was chained to the rock to be devoured by a sea monster. This was done as a punishment to her mother, Queen Cassiopeia, who had boasted that she was more beautiful than the sea nypmhs, thus greatly angering Neptune. Her father was Cepheus, king of Ethiopia. Fortunately, she was rescued by Perseus, who arrived in time on the back of Pegasus and bearing the frightful head of the Medusa. He showed this to the monster, the beast was turned to stone, and Andromeda was released. Practically all the characters of this story are represented in the sky. Cassiopeia is just to the north of Andromeda, and is represented by the familiar W-shaped group of stars. To the west of Cassiopeia is her husband, Cepheus, and to the east the hero, Perseus. The sea monster is represented by the constellation Cetus, below Andromeda near the horizon.

The Southern Fish

The other first magnitude stars of the month are also near the horizon. Low in the south can be seen a bright star, Fomalhaut, that marks the southern fish, Piscis Austrinus. A little above the eastern horizon can be seen a star of a distinctly ruddy color. This is Aldebaran, the eye of the bull, Taurus. A little higher, and farther north, just below Perseus, is Auriga, the charioteer, which contains the brilliant Capella, next to Vega in order of brightness among the stars that we can see.

Saturn, the only naked-eye planet to be seen in the evening sky this month, is low in the southwest, in the constellation of Sagittarius, the archer. It is below Altair, and its steady yellowish



THE NORTHERN HEAVENS

This month contain Vega, the brightest star now visible in the evening. Close to the horizon can be seen the Great Dipper, of the constellation Ursa Major, and above it the familiar Little Bear.

light makes it easily located. In brightness it is inferior to Vega and Capella, but brighter than Altair, Aldebaran, Fomalhaut or Deneb. However, it is so low in the sky that it is somewhat dimmed, because its light has to pass through a greater amount of the earth's atmosphere before it reaches our eyes.

If you get where you have a clear view to the north, you will see the Great Dipper in Ursa Major, the great bear, just above the horizon. This constellation is now at its lowest point in the evening, for it is one of the so-called "circumpolar" groups. Most of the constellations, like Aquila or Orion, rise over the eastern horizon, cross the sky, and set behind the western horizon. But the circumpolar constellations never set. They swing around the north pole of the skies, around which all of the stars seem to turn. Actually, this point is simply the part of the sky directly above the north pole of the earth, which itself is turning. At the north pole, all of the constellations that can be seen are circumpolar, and there, during the long six months' night, no star would rise or set, but each would make a complete swing around the observer, every 24 hours, always at the same height above the horizon. As no man has ever been at the north pole during the Arctic night, no one has ever seen this effect in reality, but it can be duplicated with the marvelous Zeiss planetaria, which will soon be in operation in several American cities, the first having opened last year in Chicago.

At the equator of the earth, there are no circumpolar constellations. There, the north pole of the heavens is directly on the northern horizon, and the south pole is similarly on the horizon due south. Consequently, all the constellations set and rise during each 24-hour period.

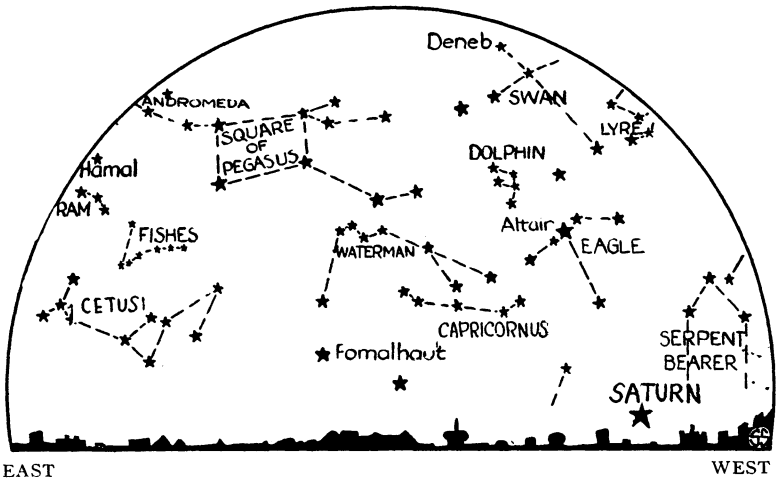
Constellations that Never Set

At a point in middle latitudes, like that of the United States, about 40 degrees north, you can imagine a circle drawn in the sky, with the polar star at the center, and the lower edge just touching the northern horizon. This circle includes all the constellations that never set. For 40 degrees north latitude they are Ursa Minor, the lesser bear, in which is located the pole star, Polaris; Draco, the dragon, which partially encircles the pole; Cepheus; Cassiopeia; most of Ursa Major, the great bear Camelopardalis, the giraffe, and a part of Lyncis, the lynx, two minor constellations containing no bright stars.

Anyone with a camera can make a simple experiment to show how the stars seem to revolve around the north pole. All you have to do is take your camera some dark clear night and set it so that it points to the northern sky. It had better be away from any city lights. Open the shutter, as you would for a time exposure, and leave it, firmly supported, for several hours, or all night if you wish. It should be closed before the break of day, however. When the film is developed, the stars will show as arcs of concentric circles, with the pole at the center. Near the center you will see a very small arc. This is the pole star itself, which is thus shown to be not exactly at the pole. Actually, it is about a degree and a quarter, or two and a half times the width of the full moon, away from that point. Photographs through large telescopes have revealed several hundred stars still closer to the pole, but all very faint.

In addition to the rotating around the pole every day, the stars turn around another point at the same time. This is a point in the constellation of Draco, known as the pole of the ecliptic. But instead of taking 24 hours for one rotation, this takes 25,600 years. As a result, our pole star is only the temporary occupant of that place of honor. About 3000 B. C., the star which we call Thuban, in the constellation of Draco, was the pole star, and it will be again about the year 23,000 A. D. But before that time, in the year 14,000, Vega, which is now so conspicuous in the western evening sky, will mark the pole.

Besides the stars already mentioned, October brings an eclipse of the sun. But though it is the largest of any of the three solar eclipses this year, it is not total, and so is scientifically unimportant. It will be seen only from a remote part of the world, including the south pole and the southern tip of South America, so it will attract little attention. It occurs on October 11.



SATURN

The only naked eye planet to be seen shines low in the southwest and its steady yellow light makes it easily located. Fomalhaut, not far bove the house tops, is one of the six first magnitude stars visible in October evenings.

Slice Bitten Out

At that time the moon will cover about nine-tenths of the sun's diameter, so, where it is visible, a goodly slice will seem to be bitten out of the sun's disc. But the remaining tenth is more than enough to prevent any of the observations for which astronomers frequently travel around the earth to observe a total eclipse of the sun.

An eclipse of the sun, whether total or partial, always occurs at new moon, so this phase is on the eleventh also. Last quarter comes on the fourth, first quarter on the 18th and full moon on the 26th. Thus, from about the 15th to the 28th, moonlight evenings will be available for any use to which they may be put.

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Fish have been added to the livestock which farmers may raise for profit; at least, 15 Nebraska land owners have taken to raising game fish to be sold for restocking of ponds.

According to health officials, drinking fountains should have the water flowing out at an angle rather than vertically, because the vertical bubble allows water to flow back into the fountain, thus introducing germs.