ASTRONOMY

Brightest Star Now Visible; Regulus Occulted Dec. 18

Winter Constellations Developing Fullest Splendor, With Orion and Taurus Holding Center of Stage

By JAMES STOKLEY

THE planets that have been a feature of the evening sky during the past year have now almost completely vanished, but in their place some of the most glorious of the starry groups have come.

The brightest star in the sky, Sirius, the dog-star, shines now in the southeast. Almost directly east and only slightly inferior in brightness, is Procyon. These stars mark the greater and lesser dogs, Canis Major and Canis Minor, that accompany the hunter Orion, the constellation seen directly above Sirius. The most characteristic feature of this famous group is the row of three stars that form the warrior's belt, now in a vertical position. To the south of the belt is a brilliant star, Rigel, above it is Bellatrix and to the north is Betelgeuse.

Above Orion is a bright reddish star. This is Aldebaran, and it marks Taurus, the bull, the star representing the animal's baleful eye. Old star maps with their picturesque mythological figures revealed Orion with upraised club about to strike the charging bull. The row of stars running northwards from Betelgeuse is the arm with the club, and the stars between Bellatrix and Aldebaran account for the other arm.

Another constellation with two well-known stars is just north of Orion. This is Gemini, the twins, and the stars are Castor and Pollux. As the group is seen these December evenings in the eastern sky, the two are a little to the north of the east point, one above the other. Pollux, brighter of the two, is the lower.

Above Gemini is Auriga, the charioteer, with Capella, third most brilliant of the stars now visible. Perseus is still higher, now almost at the zenith. While it does not contain any first magnitude stars, it is a conspicuous constellation, with a curved row of stars, starting towards the northwest and turning around as it approaches Capella. This is called the "segment in Perseus." This also forms the eastern side of a letter A, the top of the A being at the northwestern end of the segment. Next to Perseus to the northwest is Cassiopeia, with its well-known stars in the shape of a W.

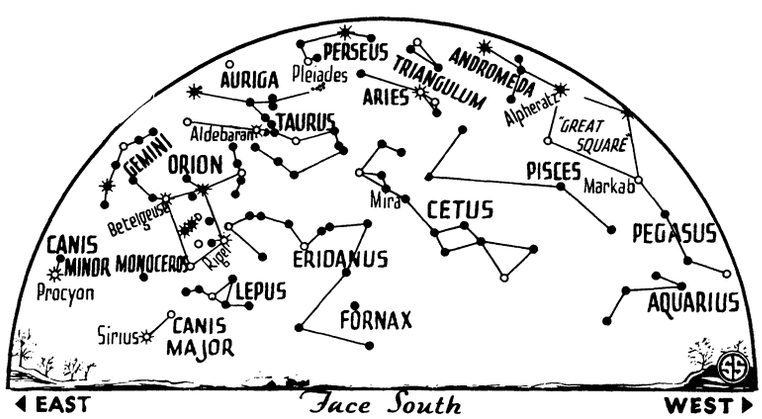
High in the west and now standing on one corner is the square of Pegasus, made of four stars of approximately equal brightness, one of which (the upper one) is in the neighboring group of Andromeda. Low in the northwest standing upright is the northern cross, with the first magnitude star Deneb at the top. The cross forms part of Cygnus, the swan, which is now getting ready to dive behind the horizon and disappear from the evening sky until next summer.

Lyra, the lyre, is nearby, still lower and farther to the north. The bright Vega remains visible, but, though it is the second brightest of the stars now seen in the evening sky, it is so low and its light is so much reduced by its passage through the atmosphere of the earth, that it is far inferior in brilliance to Capella.

In the southwest in the early part of the evening the planet Saturn can be seen near the horizon. However, it sets about three hours after the sun and is not included on the maps, which represent the sky as seen about 9:00 p. m., in the middle of the month, an hour later at the beginning or an hour earlier at the end of December.

If you stay up late enough you can see some other planets. Mars and Jupiter both rise about midnight and can be seen in the east in the early morning hours. Jupiter is the lower and brighter of the two. Mars can also be distinguished by its red light. Both are easily recognized as planets because of their steady glow, so different from the scintillations of the stars. Later in the morning, about two and a half hours before sunrise, Venus arises and shines with a brilliant light. Mercury, nearest of all the planets to the sun, comes into view on the twenty-third and then can be seen for an hour or so before sunrise. Thus, just before Christmas, the morning sky before sunrise will afford an extraordinary display of planets. Mercury, Venus, Mars and Jupiter will be visible simultaneously.

Another interesting constellation in the December evening sky, though it contains no especially bright stars, is Cetus, the whale, which can be seen in the southwest in the position indicated on the maps. The most interesting body in this group, and, indeed, one of the most interesting in the sky, is the star Mira, the first variable star ever to be discovered. This was first noticed on August 13, 1596 by David Fabricius, a European amateur astronomer. Then it disappeared from his view, but he saw it again on February 15, 1609. In 1638 a Dutch astronomer, Phocylides Holwarda, gave the true explanation of its strange disappearances and returns. He showed that it was a variable star which more or less regularly diminishes and increases in brilliance. Many variable stars have been found since then, and



THE HUNTER AND THE BULL

Magnificent in the southeast, this classic drama of the heavens again becomes prominent with the coming of winter.

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one whole branch of astronomy is devoted to their study; but Mira still remains perhaps the most interesting.

While many variable stars are perfectly regular, Mira is very uncertain. On the average, it takes about 330 days for it to go through a complete cycle, but sometimes the period is reduced to as little as 300 days while at other times it is as much as 360 days. When brightest, it is sometimes of the first magnitude. In 1779 Sir William Herschel found that it was nearly as bright as Aldebaran, but at other times, even though it was at the maximum of a cycle, it was scarcely bright enough to be seen with the naked eye. Its brightness at minimum does not have quite so large a range, the variation being from eighth to tenth magnitudes.

At present a telescope is required to see Mira, so that the position indicated by it in the maps is now vacant to the unaided eye. It is increasing in brightness and will probably reach its maximum next spring, but then the sun will be close to it, and it will not be visible. In a few more years the cycle of its variation will get out of step with the year and then, perhaps it will be seen once more.

The cause of the variability of Mira is still a mystery, but apparently it is due to some sort of pulsation, or oscillation, inside the star. Dr. J. H. Joy, astronomer at the Mt. Wilson Observatory, has found by studies of its spectrum that it sometimes approaches us and sometimes recedes, which can be explained by such a pulsation; as the side towards us, from which the light comes with which we observe it, would do that very thing. His colleague, F. G. Pease, has measured its diameter with the interferometer and has found it to be about 304,000,000 miles, more than three times the distance of the sun from the earth. Its volume is about 44,000,000 times that of the sun. If it really is pulsating, its diameter probably changes about 30,000,000 miles, but the methods of measuring the diameter are not quite precise enough to detect this.

Incidentally, the study of variable stars is one branch of astronomy in which small telescopes can do valuable work, and there is a large organization of amateur astronomers devoted to their study. This is the American Association of Variable Star Observers, generally known as the AAVSO, with headquarters at the Harvard College Observatory in Cambridge, Mass.

During December the moon is at first quarter on the fourth. On the 12th it is full, on the 20th it is at last quarter, and it is new again on the 27th. Thus the first half of the month will be provided with moonlit evenings.

On the 18th an interesting phenomenon will be visible in the eastern part of the country. The moon, then in a gibbous phase, will occult, or "eclipse," the bright star Regulus, in the constellation of Leo. Regulus rises a little later in the evening than the time for which the maps are intended.

At about 9:50, eastern standard time, the star, which is one of the brightest that can ever be so occulted, passes behind the edge of the moon's disc for a few minutes. In the middle and western parts of the country, this event is already over when the moon rises.

Occultations are of scientific interest because they can be used to check the predictions of the moon's motion in the sky. The positions of the stars are accurately known, the exact moment at which a star passes behind the moon, or reappears afterwards, can be determined, and so the position of the moon at that moment can be found. Some occultations occur every night, but seldom does it happen to so bright a star as Regulus.

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BACTERIOLOGY

Hamburg Steak Has Fewer Germs When "Frosted"

HAMBURG steak that has been frosted has fewer germs than the non-frosted variety. The frosting, in this case, bears no relation to the kind Grandmother used to put on cakes, but is a process of quick freezing and subsequent storage at zero Fahrenheit.

Ten packages of frosted hamburg steak purchased from retail stores gave a count of between 700,000 and 3,200,000 germs to the gram, with an average of 2,000,000 per gram. It takes more than 450 grams to equal a pound of hamburger. Hamburg steak of highest quality purchased from high grade meat markets gave bacterial counts of from 6,000,000 to 43,000,000 bacteria per gram, it was found by Laurence P. Geer of Massachusetts Institute of Technology, and William T. Murray and Ernest Smith of Birdseye Laboratories, Gloucester, Mass.

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BOTANY

Arabs Use Red Squill To Kill Vermin

RED SQUILL, recommended by Occidental biologists as an efficient yet safe rat poison, is used by the Arabs of Palestine and other parts of the Near East against a considerable variety of vermin. They poison mice with it, they rub it on the walls of their houses to drive out insect pests, and they apply it to worm-infested sores on their donkeys to clear them up. These Arab uses of the plant, established by long tradition, have been listed by Dr. Ephraim Ha-Reubeni of the Hebrew University in Jerusalem.

Red squill, known also as sea onion, is related to both onions and lilies. It grows wild in the Near East, so that it is easy to obtain. In many places it is a weed, and field laborers clearing it out of cultivated areas often suffer severely from the effects of its irritating juice on their hands.

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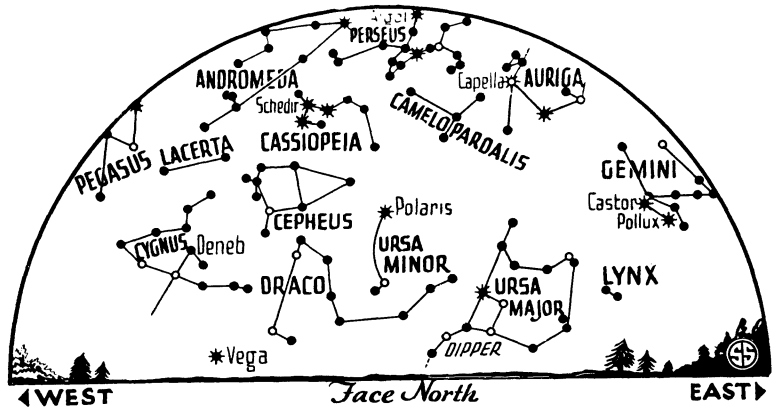

THE QUEEN AND THE BEAR

Cassiopeia, the proud queen, is throned high in the northern sky, while the Great Bear swings low near the horizon.