ASTRONOMY

Eclipsing Star

Algol, "the Demon," Once Thought to be Medusa's Eye, Is Really Twins, One Star Revolving Around the Other

By JAMES STOKLEY

THE FIGURE of Perseus, the "champion," directly above Cassiopeia, is shaped something like two large fish-hooks. One hook, which marks his foot, reaches almost to the Pleiades, in Taurus. Near this row is one of the most interesting stars in the sky, called Algol, and indicated on the maps. Like many star names, this one comes from the Arabic, a fact which is betrayed by the first two letters. "Al" is the Arabic article, or "the," and most star names starting with these letters, such as Aldebaran, Alnitak and Alcyone (which is the brightest of the Pleiades) are also Arabic.

Greek Into Arabic

The reason for this language having contributed so much to astronomical nomenclature is found in the fact that during the Dark Ages in Europe, the Arabs took many of the older Greek and Latin star names, converting them into Arabic. After the revival of learning, it was from the Arabic that they came back into European literature.

"Algol" is a corruption of "al Ghul," which means "the demon," and is rather curious, because the Arabs rarely gave uncomplimentary names to the stars. Perhaps they recognized something peculiar about it, the same thing, possibly, that led the Greeks and Romans to imagine that it marked the eye of Medusa, that terrible creature with hair of live snakes, whom Perseus killed.

An Englishman, named Goodricke, in 1783, was the first modern astronomer to recognize the peculiarity of Algol, and to give a correct explanation. For about two days eleven hours the star remains of its usual brightness, about second magnitude. In about five hours it loses about two-thirds of its brilliance, then in five more hours it returns to normal. The minimum occurs at intervals of 2 days, 20 hours, 49 minutes.

Goodricke's explanation was that Algol consists of two stars, one bright, one dark, revolving around each other once in this period. It happens that the plane in which they revolve is nearly in line with the earth, so, on every revolution of the dark body, it partially eclipses the bright one, thus reducing its light. However, the dark one is not entirely non-luminous, because modern studies have shown a slight reduction in the total light as the brighter companion passes in front of the dark one. The spectroscope, which analyzes the light of a star and permits us to tell whether they are moving towards or away from us, proves that this is the correct explanation. Just before the dark one eclipses the bright star, the latter is receding, while after eclipse it is coming towards us. The spectroscope shows this to be the case.

During February, it will be interesting to watch Algol and its changes. On February 3, 5, 11 and 28 the eclipse will occur during or close to the evening hours, and the star's brightness will be noticeably less than on other evenings. It would be a good idea to compare its brilliance with nearby stars on the various nights. A pair of opera glasses will help.

Winter Constellations

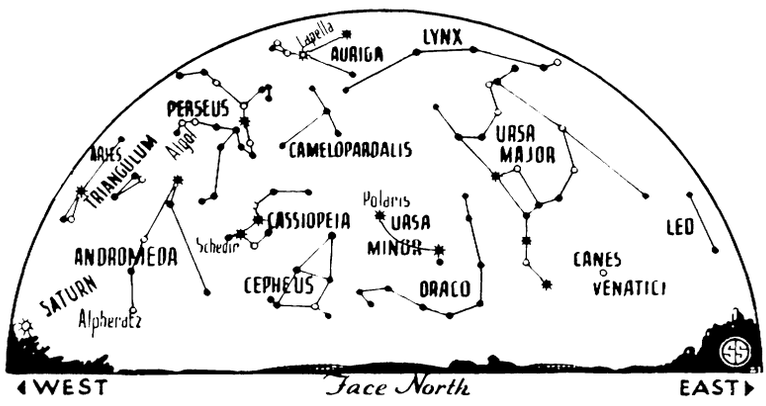
This month the magnificent winter constellations, which were so prominent during January, are still with us, and can be seen to better advantage. Directly south is Sirius, the dog-star, in Canis Major, the great dog. As Sirius, because of its relative proximity, shines more brightly than any other star visible in the night sky, it is easy to locate. But almost equally easy is the figure of Orion, the warrior, above and to the right of Sirius. Three stars in a row, called Anilam, Alnitak and Mintaka, form his belt. Above the belt is a bright star of reddish hue, Betelgeuse. This, with Bellatrix, a somewhat fainter star to the right, indicates his shoulders. On the opposite side of the belt is Rigel, which marks one of Orion's feet.

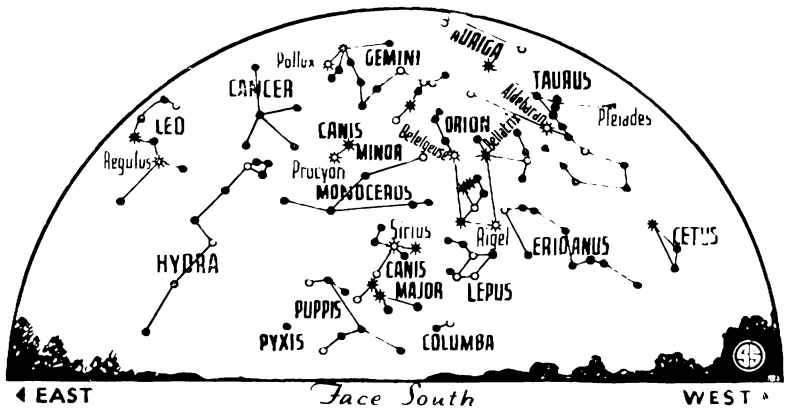
The Face of Taurus

Above Orion, and to the right, about as far from the belt as Sirius in the opposite direction, is a V-shaped group of stars called the Hyades. This outlines the face of Taurus, the bull, and the brightest star of the group, called Aldebaran, is one of his eyes. Where his shoulder would be, appear the Pleiades, a little cluster of stars often called the "seven sisters," and sometimes, though erroneously, the "little dipper." Most people have no trouble in seeing six of these stars, while unusually keen-eyed persons may see as many as ten or twelve. Many more can be seen through a good pair of binoculars, while a moderate sized telescope reveals hundreds.

Above Sirius and to the left is another dog, Canis Minor, in which is found the star Procyon. Still higher are Gemini, the twins, the most prominent stars being Castor and Pollux. Pollux, lower, is the brighter of the pair. Almost directly overhead is Capella, a star in the group called Auriga, the charioteer. But there is still another star of the first magnitude, not mentioned above. This is Regulus, in the lion, Leo, which is seen to the east. Part of this group forms the "sickle," named because it is shaped like that implement. Regulus is at the end of the handle, which is pointing to the southeastern horizon.

In the northeast, with handle down-





ward, is the great dipper, part of Ursa Major, the great bear. The two uppermost stars are the pointers, indicating the direction of the Pole Star, itself at the end of the handle of the Little Dipper, and part of the little bear, Ursa Minor. In the northwest is the figure of Cassiopeia, shaped like a W lying on one side, and above is Perseus.

Four Planets Visible

All the objects mentioned above can be found on the accompanying maps, which show the appearance of the skies at 10:00 p. m., February 1; 9:00 p. m. on the 15th, and 8:00 p. m. on the 28th.

There is also indicated, low in the west, the planet Saturn, which is yellowish in color, and brighter than most of the stars. Saturn sets about four hours after the sun, while a second planet, Jupiter, can be seen just after sunset. It disappears about an hour after the sun. Mercury is not visible at all this month, but Mars, in the constellation of Scorpio, and of the first magnitude, rises toward the southeast about an hour after midnight. Its steady red glow makes it easily recognizable. Venus, in Sagittarius, the archer, comes up about two and a half hours before the sun, and is of magnitude minus 4, far brighter than any other star or planet.

Science News Letter, January 28, 1939

Celestial Time Table

Date		*Time (E.S.T.)*	*Event*
Fri.	3	1:33 a. m.	Algol at minimum brightness.
		7:00 p. m.	Moon nearest earth, distance 221,600 miles.
Sat.	4	2:55 a. m.	Full moon.
Sun.	5	10:23 p. m.	Algol at minimum.
Fri.	10	11:12 p. m.	Moon at last quarter.
Sat.	11	4:01 p. m.	Algol at minimum.
Sun.	12	7:30 a. m.	Moon passes Mars, less than four lunar diameters to the north.
Tue.	14	9:47 p. m.	Moon passes Venus, about three lunar diameters to the north.
Thu.	16	9:00 p. m.	Moon farthest from earth, distance 252,600 miles.
Sat.	18	9:00 p. m.	Mercury in line with sun.
Sun.	19	3:28 a. m.	New moon.
Mon.	20	7:25 a. m.	Moon passes Jupiter, about eleven lunar diameters to the north.
Thu.	23	12:43 a. m.	Moon passes Saturn, about nine lunar diameters to the north.
Sun.	26	12:08 a. m.	Algol at minimum.
		10:26 p. m.	Moon at first quarter.
Tue.	28	8:57 p. m.	Algol at minimum.

Science News Letter, January 28, 1939

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast nd Geodetic Survey and the Jesuit Seismological Association resulted in the location of the following preliminary epicenter:

Friday, January 20, 5:40.3 p. m., E.S.T.

Off Pacific coast of Central America. Latitude 13 degrees north, longitude 90 degrees west, approximately.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL May 21, 1938.

PHYSICS

High-Speed Electrons Create Strange Glow

HIGH-SPEED "bullets" from the "atom gun" at the University of Notre Dame are being used to study a strange bluish-white light which is found in liquids when they are bombarded with swift-traveling electrons.

This strange light, known as Cerenkov radiation after the Russian scientist, P. A. Cerenkov, who discovered it in 1934, is produced when the electrons are traveling through a liquid with a speed greater than the speed of light in that liquid.

The original discovery was made with beta-ray electrons given off by radium. These electrons come off with all sorts of speeds. While they were useful in creating the faint blue-white light in a liquid they could not be used for a quantitative study of the phenomenon.

Controlled Electrons

Prof. George B. Collins and Victor G. Reiling of Notre Dame, therefore, took up the light's study, using electrons whose speed and energy were definitely controllable. Electrons having energies of 2,000,000 electron-volts from Notre Dame's electrostatic generator were used.

These swift electrons were shot into a vessel containing a liquid and a small sheet of mica or cellophane. The light produced was caught and analyzed by a spectograph placed at right angles. Alcohol, benzene and water were the three liquids used.

It was found that the radiation was continuous and extended from the long-wave sensitivity of the spectrum plate into the region of the ultraviolet where absorption occurs in the particular liquid used.

The intensity of the Cerenkov rays was found to be greater in the shorter wave lengths than are rays produced by a tungsten lamp in the same region.

The theory of the origin of the rays had previously been worked out by the Soviet scientists I. Frank and Ig. Tamm from Cerenkov's original work. This theory was confirmed by the Notre Dame work.

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