ASTRONOMY

Five Planets Shine

Three Are in Evening Skies, Two Are Morning Stars; Winter Star Groups Will Brighten February Heavens

By JAMES STOKLEY

AGAIN, the two planets, Jupiter and Saturn which, in recent months, have been dancing together in a complicated step, form a conspicuous pair in the evening sky. They are to the west, in the constellation of Aries, the ram. At the beginning of February, Jupiter is lower, but it passes Saturn on the 20th. However, Jupiter is considerably brighter, which makes him easy to identify.

During the day, on February 3, the crescent moon will pass these planets. The previous evening it will appear below them, and that evening just above.

Sirius, the dog star, directly south, is the brightest star at night. Though it does not equal Jupiter, it does exceed Saturn. It is part of Canis Major, the big dog. Above this group is Canis Minor, the little dog, with the star Procyon.

Magnificent Orion, the warrior, now dominates the southern sky. To find him, look for the three stars in a row, that mark his belt. Betelgeuse is above, Rigel below.

A line from Sirius, through the belt stars, and about an equal distance the other side, will bring you to a V-shaped cluster, the Hyades, in which is the first-magnitude Aldebaran, red in color. This is part of Taurus, the bull, marking the animal's eye according to the old maps.

Still higher is Auriga, the charioteer, with Capella, and nearby, between this group and Canis Major, one views the twins, Gemini. Pollux is the more brilliant of the pair, to the south. The other is Castor.

Still another object of the brightest class can now be found in the evening, Regulus, in the figure of Leo, the lion, high in the east. This star marks the handle of a smaller group called the sickle.

To the north, the Great Dipper, in Ursa Major, the big bear, is swinging into a better position than it has had for months. The handle hangs down; the pointers, two stars at its top, indicate the pole star to the left. On the other side of Polaris is Cassiopeia, like a W turned on its side.

All these are shown on the accompanying maps, where the heavens appear at 10:00 p.m. in the beginning, 9:00 p.m. at the middle, and 8:00 p.m. in the closing days of February.

The other three naked eye planets will also appear during the month. On the tenth Mercury will be farthest east of the sun, and may be glimpsed low in the west as dusk is gathering. Mars, red in hue, is in Sagittarius, the archer, and rises about 3:30 a.m. Venus, more brilliant even than Jupiter, is in Capricornus, the sea goat, and comes above the southeastern horizon soon after 6:00 a.m.

February sees the concluding stage in a very rare heavenly event. When Jupiter passes Saturn on February 20, it will be for the third time since last summer. The astronomer refers to such a passing of one planet by another as a "conjunction." The first of the present series took place on August 15, the second on October 11.

Such a series, within less than a year, is called a "triple conjunction." It happened last in 1682-1683. Before that, it happened in 1425. It also occurred in 6 B.C., and may have been one of the celestial events to attract the attention of the Wise Men.

Apparently no one has yet bothered to calculate when it will occur again, but it will be a couple of centuries at least, for triple conjunctions come, on the average, about four times in a thousand years.

The reason that we have had these three successive passings may be found in the movement of the earth. The nearer a planet to the sun, the faster it travels. The earth's speed is 18.5 miles a second; Jupiter moves at 8 miles per second and Saturn at 6 miles per second.

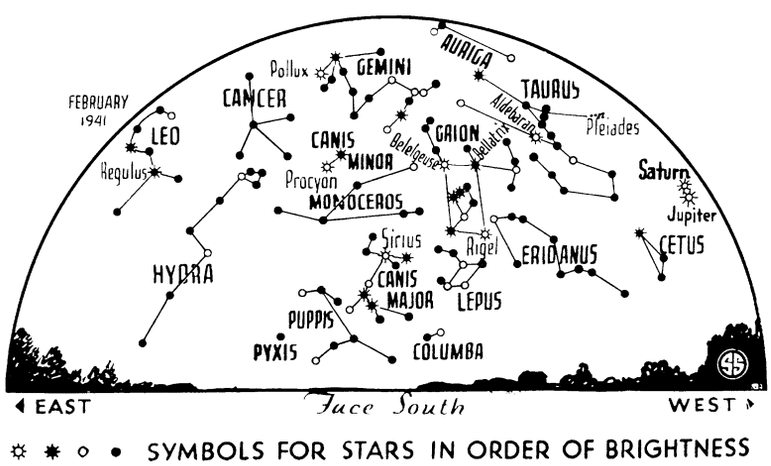
They all travel about the sun the same way but, of course, when the speedy earth overtakes our plodding neighbors, they seem to retreat. Normally their movement is from west to east—then it becomes "retrograde," from east to west. Every year we overtake these planets, and they show such a retrograde movement.

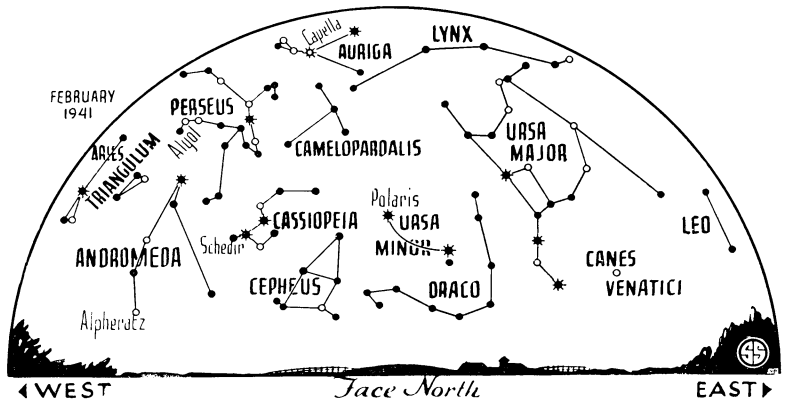
Jupiter goes around the sun in 12 years. Saturn in 29.5; the former catches up to the latter and there is a conjunction of the two about every 19 years. It so happened that the conjunction in August came just before the retrograde movement began. Therefore, after Jupiter passed his brother planet the first time, both started backwards, and there was a second conjunction.

Early in January they ceased their backward movement and started forward again, making ready for the third passing on February 20. About 1959 they will once more be in conjunction, but this will not be timed the way these have been. When, after that, Jupiter starts to back, he will not quite reach Saturn.

Almost directly overhead on these evenings it is possible to see a demon!

To us now, it looks like another star, but the Arabs used to call it "Ras al





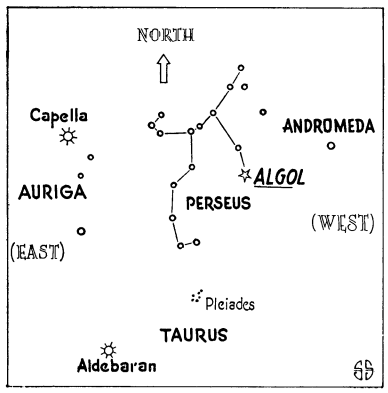
Ghul," which means "the head of the demon." Why they gave it such a name is something of a puzzle, because most of the Arabic star names, many of which we still use in slightly modified form, are more complimentary.

However, they might well have called it a demon if they had recognized what astronomers have learned about it, for this star, which we call "Algol," is one of the most famous of all variables, stars that change regularly in brightness, and it might easily bring to mind the blinking eye of some baleful creature as it goes through its cycle. Aside from the name, there is no indication that Arabs noticed this variability, but it has been suggested that they did.

The small map shows how to find Algol at this time of year.

Perseus, in which Algol is found, is just west of Capella. In shape it resembles two great fish-hooks, one of which, Perseus' foot, is immediately north of the Pleiades. Algol is near this hook. Ordinarily Algol is of the second magnitude in brilliance, a little brighter than the pole star, to the north. But late on the evening of Feb. fifth, and earlier on the eighth, eleventh and fourteenth, it will appear only about a third as bright.

Reason for this variation is that Algol



HOLD OVERHEAD

really is two stars, revolving around the common center of gravity. Many such "binary" systems are known in the sky, but two features make Algol notable. First, the plane in which they revolve is almost in line with the earth; second, one of the stars is bright, the other very much darker. This means that on every revolution, which takes 2 days, 20 hours, 49 minutes to complete, the dark one comes in front of the bright star, and there is a partial eclipse. From the time the dark body starts coming in front of the other until the eclipse is greatest takes about five hours, then five hours more and Algol shines with its full vigor.

No telescope is powerful enough to show the separate stars in the system, but their presence is revealed by analyses of the light made with the spectroscope. The lines that are formed in this spectrum swing back and forth regularly in the same period in which the light changes. This proves that the brighter star is alternately approaching, then receding, as its dance goes on, and that there must be another star there, even though we cannot see it, to be its partner and hold it by gravitational pull.

Celestial Time Table for February

Sunday, Feb. 2, 9:00 p.m., Moon farthest —251,300 miles away. **Monday, Feb. 3,** 1:59 p.m., Moon passes Jupiter; 4:28 p.m., Moon passes Saturn. **Tuesday, Feb. 4,** 6:42 a.m., Moon in first quarter. **Thursday, Feb. 6,** 2:22 a.m., Algol at minimum. **Saturday, Feb. 8,** 11:11 p.m., Algol at minimum. **Monday, Feb. 10,** 7:00 p.m., Mercury farthest east of sun, visible low in west after sunset. **Tuesday, Feb. 11,** 7:26 p.m., Full moon; 8:01 p.m., Algol at minimum. **Friday, Feb. 14,** 3:00 p.m., Moon nearest, 227,000 miles away, 4:50 p.m., Algol at minimum. **Tuesday, Feb. 18,** 1:07 p.m., Moon in last quarter. **Thursday, Feb. 20,** 2:00 p.m., Jupiter passes Saturn; 9:52 p.m., Moon passes Mars. **Monday, Feb. 24,** 9:15 p.m., Moon passes Venus. **Tuesday, Feb. 25,** 10:02 p.m., New moon.

Eastern Standard Time throughout.

PSYCHOLOGY

Find Individual Differences Even Among Paramecia

DESPITE the present tendency toward regimentation, individual differences do exist even among the paramecia, those little microscopic creatures that dart about in pond water.

They differ in ability to "taste," or at least in what would more accurately be called chemical sensitivity. Some can take more salt on their food than others, and are likely to persist in this over a period of time. This was discovered by Dr. John W. French, Princeton psychologist, when he watched the behavior of paramecia from the same colony when dinner was served. His results are reported in the *Journal of Comparative Psychology.* (December, 1940)

The little water creatures also differ in what might almost be called "social habits," Dr. French found. When bacterial food was placed with a dropper in the exact center of their miniature laboratory pond, practically all the paramecia swam into the food area and once there refused to leave. Within a few minutes only a few stragglers remained away from the feast. Then, in a short time, the animals within the food area formed many groups, motionless and in contact with one another. Others, "solitary drinkers," swam about outside any group.

By an ingenious method, Dr. French "counted" those within the groups and also the free-swimming animals. When an electric cathode was dipped in, it attracted almost all the free swimmers. These were removed with a dropper and placed in one dish. The grouped animals were then put in a separate dish. Repetitions of the experiment showed that more of the previously grouped animals again formed into groups than in the case of those who had previously remained free.