ASTRONOMY

Pegasus High in South

The Winged Horse constellation is prominent on October evenings. The horse which is inverted can be located easily by first finding the "Great Square."

By JAMES STOKLEY

➤ HIGH in the southern sky on October evenings can be seen a group of stars that form the well-known constellation of Pegasus, the winged horse. Although the stars are not extremely bright, their arrangement makes them easy to locate, serving as a useful guide for the location of other constellations.

It is a good idea to look first for the four stars that outline the "Great Square." This is shown on one of the accompanying maps, depicting the southern skies, as seen from a latitude approximately 40 degrees north. These maps were drawn to give the appearance of the skies at about 10:00 p. m., your own kind of standard time, at the first of October.

At any particular hour the stars and constellations seem to slip around the sky from east to west from one night to the next. Thus in the course of the year many different parts of the celestial sphere come into our view. For this reason, the arrangement shown is seen at about 9:00 p. m. in the middle of the month and about 8:00 p. m. at the beginning of November.

Outline of Pegasus

Actually, only three of the stars that mark the corners of the square are in Pegasus. Alpheratz, the one at the upper left, is in the neighboring constellation of Andromeda. The star in the opposite corner, Markab, is in the shoulder of the horse. The angular line of stars extending to the southwest from Markab is supposed to form the neck and head, for the horse is shown inverted! Enif marks his nose. The assemblage of stars going to the right from Scheat in the upper right corner forms the forelegs. The animal's hind quarters are not shown on the old star maps which used to show the imaginary figures about the stars. Algenib, the star in the lower left corner of the square, is in the wing.

Just below and also to the left of the square, are the stars marking Pisces, the fishes. Below the stars of the head of Pegasus we can see the figure of Aquarius, the water-carrier, where the only planet now easily visible is located. The planet is Jupiter, which is in the southeast at sunset and which remains conspicuous until early morning hours.

Vega in Lyra, the lyre, the brightest star visible these evenings, is seen high in the west. Directly above it is Cygnus, the swan, which contains the first magnitude star Deneb. The two top stars of the square of Pegasus, followed to the right, serve as pointers to the swan. To the left of Lyra is Aquila, the eagle, with another bright star, Altair.

Low in the south we can see Fomalhaut in Piscis Austrinus, the southern fish, another star of the first magnitude, though its lowness causes a diminution in the apparent brightness. This also is true of Aldebaran in Taurus, the bull, shown rising just a little north of the east point. Next to it toward the left we find Auriga, the charioteer, with brilliant Capella.

Four Planets Visible

In addition to Jupiter, hree other planets are visible for short periods. Mars, in the constellation of Scorpius, sets about 2½ hours after the sun, a little too soon to get into the maps. On Oct. 2 Mercury is farthest west of the sun, so for about a week around this time it is visible low in the east as dawn is breaking. Saturn, considerably fainter, is in the same part of the sky, and Mercury passes close by it at 4:00 a. m., EST, on Oct. 6.

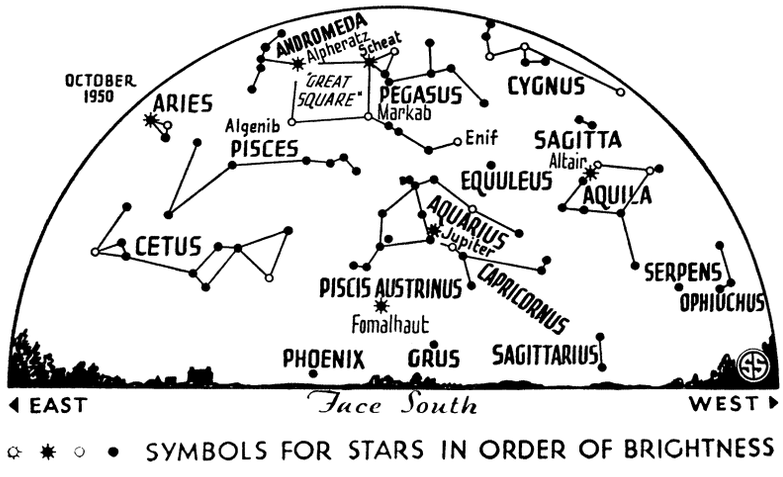
At the beginning of the year when Jupiter was visible in the western sky at twilight, it was not where we see it now, but in the constellation of Capricornus, the sea-goat, next-door to the right from Jupiter's present home. Until about the middle of March the planet was too close to the sun's direction to be seen with ease. Then it appeared as a morning star, seen in the east before sunrise. With the change of the skies month after month it appeared earlier and earlier until midsummer, when it began to be prominent during the evening as it is now.

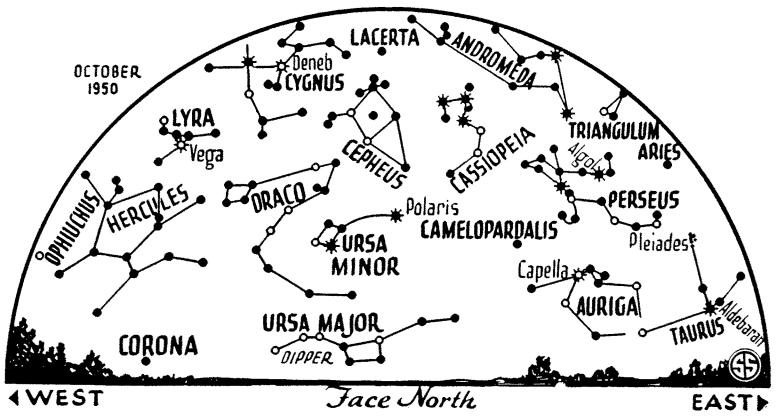
Until the end of June Jupiter's movement among the stars had been from west to east, taking it from Capricornus into Aquarius. But on June 27 it seemed to stand still and then to start back towards Capricornus again. On Oct. 24 it almost reaches the border of that constellation, but again it is stationary. One can see this during the month by noting its position with respect to the star in Aquarius shown just below the planet. After Oct. 24, its movement is again toward the east.

Movements of the Planets

Such movements of the planets were most puzzling to the ancient astronomers, who thought the earth to be fixed, with all the heavenly bodies revolving around it. That meant, if true, that when a planet seemed to go backwards for a time, it could really reverse its movement. One explanation that held sway for many centuries was the Ptolemaic theory. It was first proposed by a Greek astronomer, named Hipparchus, who lived on the island of Rhodes around 130 B. C.

Since a circle was considered the only "perfect" figure, it was supposed that the heavenly bodies had to move in circles. Hipparchus proposed that they moved in a series of circles. Jupiter, for example, revolved once every 399 days in a small circle called an epicycle. The center of this epicycle moved once in 12 years around a larger circle called the deferent, which had the earth at its center. Thus, the general progression was toward the east, though sometimes the movement in the small circle made it go westward for a time. The other planets moved on similar deferents and epicycles. As the planetary movements were further studied, it was occasionally found that a single epicycle would not explain





the observations, so others were added, one on top of another. Finally this became so complex that, as one famous astronomer remarked, "the music of the spheres became lost in a whir of machinery!"

Theory of Copernicus

The theory of the Polish astronomer Copernicus, first published in 1543 and developed by others, brought a great simplification of this by having the earth itself as one of the planets, all of which revolve about the sun. According to these ideas, now known to be correct, the movements we observe in the skies are combinations of those of the object itself and this moving earth from which we make the observations.

As one travels in an express train and overtakes a freight on the next track, it may appear that the slower train is actually going backwards, though one knows they both are moving the same way. The nearer a planet is to the sun, the faster in miles per second is its speed. Consequently when we are in the same direction from the sun as Jupiter we overtake it. As we view it against the background of distant stars, it seems to be moving backwards for a time.

Time Table for October

Oct.	EST	
1	12:28 a. m.	Algol (variable star in Perseus) at minimum brightness
2	8:00 p. m.	Mercury farthest west of sun, visible for a few days low in east at dawn
3	9:16 p. m.	Algol at minimum
4	2:53 a. m.	Moon in last quarter
6	4:00 a. m.	Mercury passes Saturn
	6:05 p. m.	Algol at minimum
9	9:28 p. m.	Moon passes Saturn
10	7:32 a. m.	Moon passes Mercury
11	8:33 a. m.	New moon
12	11:00 p. m.	Moon nearest, distance 224,300 miles
15	4:00 a. m.	Moon passes Mars
17	11:18 p. m.	Moon in first quarter
20	10:27 a. m.	Moon passes Jupiter
21	2:09 a. m.	Algol at minimum
22	early a. m.	Meteors visible from constellation of Orion
23	10:57 p. m.	Algol at minimum
24	9:00 a. m.	Jupiter stationary (has been moving west since end of June but now resumes easterly motion)
25	3:46 p. m.	Full moon
26	7:46 p. m.	Algol at minimum
28	3:00 p. m.	Moon farthest, distance 252,400 miles

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

Science News Letter, September 23, 1950

TEXTILE ENGINEERING

"Funginert" Materials Not Hurt by Fungi

➤ "TO SPOT the stuff that mold can't hurt
A new word's coined—say funginert."

And it is a word that means better, longer-lasting equipment of all kinds for the GI's in Korea. Soldiers have found that the ever-present fungi can cause severe damage to electrical equipment as well as many clothing materials. New materials, the funginerts, designed to have the property of not supporting fungus growth are replacing the older, more vulnerable ones.

The word was coined by Dr. Walter N. Ezekiel of the Navy Department's Bureau of Ordnance. Also suggested by him are parallel words, such as "bacterinert" and "microbinert." These would spot cases in which it is desired to describe materials inert to bacteria or to microorganisms in general, he states in the journal, SCIENCE (Sept. 1).

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VETERINARY MEDICINE

Accurate, Fast Test for Foot-and-Mouth Disease

➤ A FAST new test for one of the most dreaded viruses in the cattle world has come in Mexico's battle against foot-and-mouth disease.

This is the plague which closed the Rio Grande to all livestock shipments more than three years ago. The new technique of the U.S.-Mexican Aftosa Commission in pinning the disease down was reported at the meeting of the American Veterinary Medical Association by Drs. Fernando Camargo, Ervin A. Eichhorn, Jacob M. Levine and Alfredo T. Giron, all of Mexico City.

The new test has an error of less than one percent. It can tell the foot-and-mouth virus from a similar infection called *vesicular stomatitis,* and can correctly identify different strains of these diseases. It can cut to a few hours the time required to spot foot-and-mouth disease in specimens sent to the laboratory, and hence speed up the isolation of infected animals.

Veterinarians revealed these other new tricks:

Cortisone, the anti-arthritis wonder drug, is now being used successfully to treat cattle with ketosis, a disease marked by changes in the pituitary gland and adrenal cortex. The work was reported by Drs. J. C. Shaw, B. C. Hatziolos and E. C. Leffel of the University of Maryland.

Dr. Myron Thom of Pasadena, Calif., said X-rays and radium can be used to treat lame race horses. Radiation helps the animal's system to flush away bacteria and debris in injured tissues, reducing pain and swelling and speeding natural repair processes.

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