

ASTRONOMY

Stars of Autumn Now Shining

Planets are absent in evenings as September brings new season. Autumnal equinox occurs Sept. 23. Vega, in Lyra, the lyre, is brightest star.

By JAMES STOKLEY

➤ ALTHOUGH none of the naked eye planets is visible in September through the evening, the appearance of the star groups shows to one who knows the constellations that summer is nearing its end and autumn is about to start. Ever since last June the sun has been gradually creeping southwards. On Tuesday, Sept. 23, at 5:29 p.m., eastern daylight saving time, it will reach the half way mark, and stand right over the equator of the earth. This is the autumnal equinox—it marks the beginning of autumn, in the northern hemisphere, but in the lands south of the tropics, spring is now commencing.

As for the evening skies, we see on the accompanying maps their appearance at 11:00 p.m., daylight saving time of your own variety, on Sept. 1; 10:00 p.m. on the 15th and 9:00 p.m. daylight saving time, or 8:00 p.m. standard time (which will then be in effect) at the month's close. While no planets are visible at these hours, Jupiter, in the constellation of Libra, the scales, is visible low in the southwest at sunset, and disappears a couple of hours later. About three hours past midnight Mars appears, in the figure of Gemini, the twins. Still later, about two hours before sunrise, Saturn comes up, in the constellation of Leo, the lion, a little to the north of the east point of the horizon. Mercury and Venus this month are too close to the direction of the sun to be seen.

Vega Brightest Star

Turning to the stars, which are really distant suns, shining with their own light, Vega is the brightest shown. This is in the constellation of Lyra, the lyre, high in the west. Directly overhead is Cygnus, the swan, forming a huge cross, with the bright star Deneb at the top, toward the northeast. To the south of Cygnus flies another bird, Aquila, the eagle, in which Altair is the brightest star. Between Cygnus and Aquila are two interesting little constellations, now about at their best position of the year—

Delphinus, the dolphin, and Sagitta, the arrow.

Toward the east, resting on one corner, is the "Great Square," which forms part of Pegasus, the flying horse. And below are Pisces, the fishes. The northernmost star in the square is in the neighboring group of Andromeda, the chained princess. Below her in the northeast the A-shaped figure of Perseus is shown, while lower still Capella, part of Auriga, the charioteer, is just coming into view. This is a constellation which shines high in the south during the evenings of winter, so its first appearance is a herald of the colder weather which approaches.

Arcturus Leaving Us

Low in the northwest Arcturus, in Boötes, the bear driver, which was high in the evening sky of early summer, is bowing out of the picture, for soon it will be gone from the evening skies until next year. In the south another star of the first magnitude is shown, though its proximity to the horizon, and the greater absorption of its light on that account, causes its seeming diminution to the second magnitude. This is Fomalhaut, in Piscis Austrinus, the southern fish. Above it is Aquarius, the water carrier, which, like Capricornus, the seagoat, next to it, and Sagittarius, the archer, in the southwest, are constellations of the zodiac. This is the path in the heavens through which the sun,

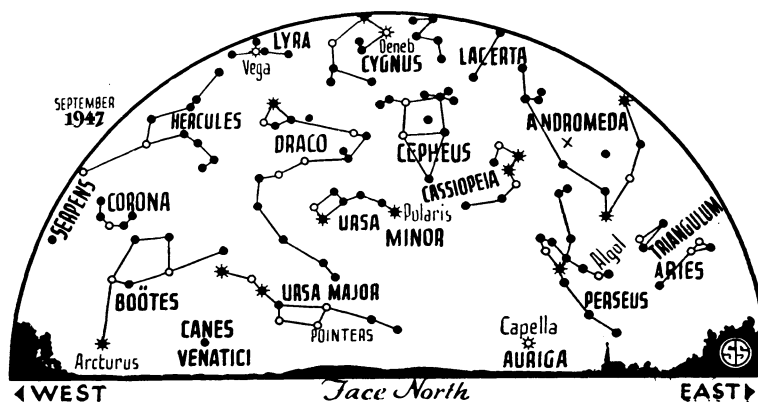
moon and planets seem to move.

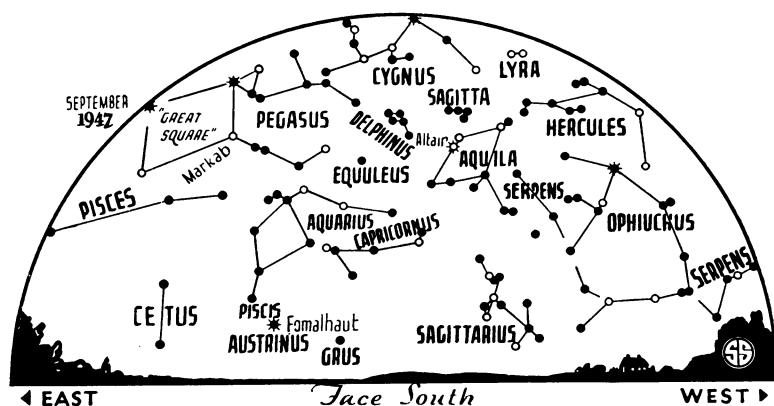
In the autumn months we have a good opportunity to see the Milky Way, for it then extends through the zenith. In competition with city lights it is hard to see, but out in the country it can be observed easily, as a luminous pathway extending from the constellation of Cassiopeia, the queen, a group in the northeast shaped like a letter W on its side. Thence we can follow it through Cygnus, and on south to Sagittarius.

Repeat Famous Discovery

With even a small telescope, or a pair of binoculars, we can make the same discovery about it that Galileo did in 1610 when he first studied the heavens with optical aid. We find that it consists of a mass of faint stars, each so distant that we cannot perceive it separately with the naked eye, but together their light combines.

It was Sir William Herschel, the 18th century English astronomer, who first offered a clear interpretation of the significance of the Milky Way in relation to the system of stars of which we are part. His studies made him realize that the reason that there are more stars in that direction is that we are there looking into a greater thickness of stars. Since the Milky Way extends completely around the sky, it means that in those directions we could travel much farther before coming to the end of the stars than if we went in other directions. In other words, our stellar system, which we call the "galaxy," has approximately the shape of a grindstone.





◊ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Our position is not at the center, which lies toward Sagittarius, but we are about 25,000 light years away from it. That is the distance that light, which travels about 11,000,000 miles a minute, would cover in a year. The brightest part of the Milky Way, therefore, is in the region of Sagittarius though because it is low in the sky this month it may not appear any brighter than the more favorably placed region above us in Cygnus.

Our galaxy is not the only system of its kind, but millions of others can be observed with telescopes outside its limits. One of these is visible to the naked eye. This is in the constellation of Andromeda, and its position is indicated on the map, by the small X under the letter R in the name of the group. This is so distant that for a long time its nature was quite a controversial matter among astronomers. Many of them thought that it and some other similar "spiral nebulae" were glowing clouds within our own system, for even the biggest telescopes failed to show any stars in their makeup. It took the 100-inch reflector at the Mt. Wilson Observatory, still the largest in the world, to break it up and reveal the separate

orbs. When the 200-inch telescope at Mt. Palomar takes the title away from the 100-inch, it will show them still better, and also will probably resolve some of the still more distant outer galaxies.

Distance of the one in Andromeda is about 800,000 light years, which means that when you observe it, the light that enters your eye has been on the way for 8,000 centuries—it began its journey before man himself had appeared on earth. Other light rays are starting from it now. What will they find when they complete their journey in this direction?

Time Table for September

Sept.	EST	
3	9:00 a. m.	Venus beyond sun
7	10:57 p. m.	Moon in last quarter
10	5:58 a. m.	Moon passes Mars
12	4:46 a. m.	Moon passes Saturn
	6:00 a. m.	Moon nearest—226,000 miles
14	2:28 p. m.	New moon
	5:33 p. m.	Moon passes Venus
15	1:31 p. m.	Moon passes Mercury
19	4:44 a. m.	Moon passes Jupiter
22	12:42 a. m.	Moon in first quarter
23	4:29 p. m.	Beginning of autumn
24	2:00 a. m.	Moon farthest—251,400 miles
30	1:41 a. m.	Full moon

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

Add one hour for the corresponding Daylight Saving Time.

Science News Letter, August 30, 1947

METALLURGY

Use Cold-Drawn Steel

► COLD-DRAWN steels are winning such an important place in many applications that standard specifications are now to be prepared by a technical committee of the Society of Automotive Engineers.

The undertaking is viewed as a step toward wider use of these basic materials in the automotive and other

industries, with a resulting saving in time and production costs. Cold-drawn steels make better parts, it is claimed, such as bolts, studs, shafts, pinions, axle tubes, frame supports and shackle pins.

The cold-drawing of steels and other metals is not a new process, but one now more widely usable because of new technics. It consists of an operation to

reduce the cross section of a rough metal bar, and to increase its length, by drawing it through a series of conical tapering holes in die plates. Each succeeding hole is a little smaller than the preceding one.

The holes may be round, square or of other shapes. The dies may be made of a number of materials ranging from industrial diamonds, tungsten carbide and steel to chilled cast iron. Metals can be formed to much closer dimensions by cold-drawing than by other ordinary processes. The method is used to produce wire, bars for bolts and other accessories, and to form tubing.

The term cold-drawing should be distinguished from cold-rolling and cold-working. Cold-working, a process used in ancient times by shaping metals by hammers, includes the other two. Cold-rolling, which consists of passing metals between a succession of heavy rollers, is used in the production of sheets, strip steels, flat wire and other products. It is used also to produce a hard, smooth, even finish for hot-rolled metals. The formation of metal for automobile tops and fenders, by pressure in a mold, is a widely-used process of cold-working.

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