ASTRONOMY

Autumnal Equinox

On September 22 or 23, the sun will reach the halfway mark in its southward journey through the sky, and fall will officially begin.

By JAMES STOKLEY

➤ AN astronomical event of September, though perhaps not a welcome one, is that which occurs this year on Sept. 23 (or late in the evening of Sept. 22 in the Central Time Zone and farther west). On this date, at 12:02 a. m., Eastern War Time, the sun reaches the halfway mark in its southward journey through the sky. This is the autumnal equinox which, in the northern hemisphere, is conventionally considered as the beginning of autumn. At that time the sun is directly over the equator. Throughout the world it then rises directly east, sets directly west. The sun shines, for half of the 24 hours, on every part of the world. The only other time when this is true is at the vernal equinox, March 20 this year, when spring begins.

Nothing occurs in the sky to mark the equinox, though it does happen this year, purely by a coincidence, that on the date in question two planets will come very close together in the eastern sky before sunrise. All the planets have now gone from the evening sky, and so none are shown on the accompanying maps, as these depict the heavens at 11:00 p. m., Sept. 1, and 10:00 p. m., Sept. 15. Saturn, however, rises in the northeast a little before midnight, and in the early morning hours is visible in the east in the constellation of Gemini, the twins. It is a little to the right of the stars Castor and Pollux, and exceeds them both in brightness.

Planets Meet

Toward the end of the month Jupiter, several times as bright as Saturn, rises about an hour and a half before the sun, so it will only be visible in the morning twilight. On Sept. 22 Mercury reaches its position farthest west of the sun, and also rises about an hour and a half before sunrise. On the 23rd, the two planets are very close together, at a distance considerably less than the diameter of the moon. Jupiter will be the easier to see, because of its superior brightness, and if you find it, you can probably locate Mercury nearby. This, however, is not a very favorable appearance of Mercury, for it can draw considerably farther away from the sun than it does at this time, and this would make it rise much higher in the sky before sunrise.

Vega Is Brilliant

As for the stars of the evening sky, Vega, high in the west in Lyra, the lyre, is the most brilliant now visible in the evening. Directly overhead is Cygnus, the swan, otherwise called the northern cross, with first magnitude Deneb. South of Cygnus is Aquila, the eagle, with Altair as the brightest star of the constellation.

There are three other first magnitude stars indicated on the maps, all of them close to the horizon. In the northwest we see Arcturus, in Bootes, a star which will soon disappear from the evening sky for a few months. But taking its place we see toward the northeast Capella, in Auriga, the charioteer, which will shine still more prominently through the autumn and winter evenings. And low in the south is Formalhaut, in Piscis Austrinus, the southern fish, a star which is so far south that only for a few months is it visible to us at all.

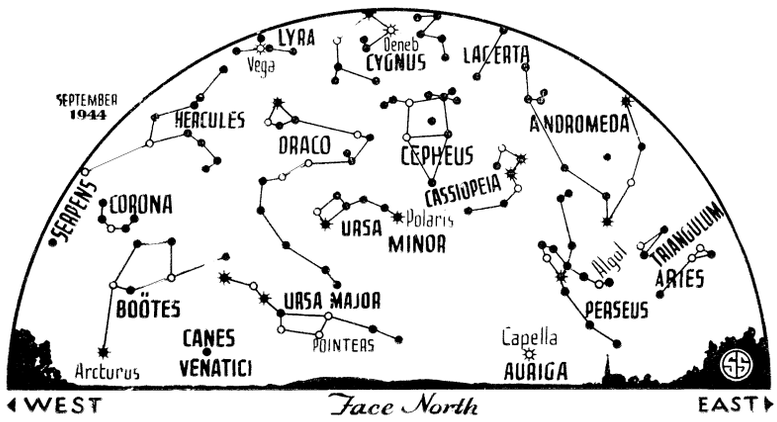
Though small, the constellation of Lyra is an interesting one. For one thing it marks approximately the direction in which we're going. The entire solar system is traveling toward this part of the sky at a speed of 12.2 miles per second. This means, of course, that the earth is going that way, too, since at the same time we are revolving around the sun, our actual path in space is not a circle, as often supposed, but a helix, like that of a man ascending a so-called "spiral" stairway.

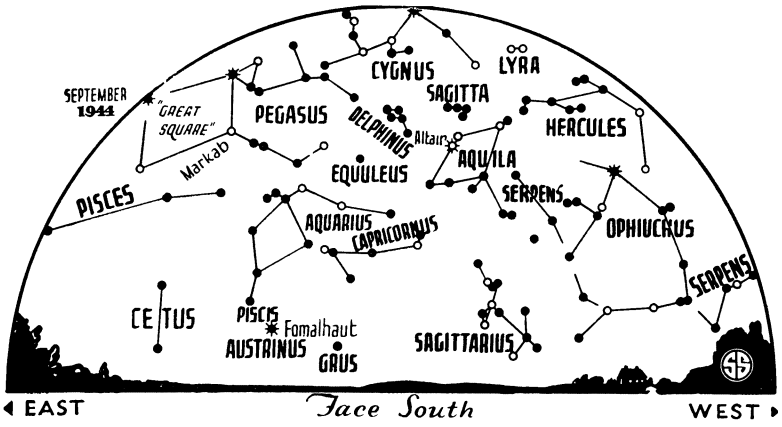
Then again, Vega, and not our present Polaris, will mark the north pole of the heavens about the year 14,000, thus resuming a post of honor which it held around 12,000 B. C. This is an effect of another movement of the earth, a "wobbling" motion called "precession" by which a number of stars serve successively as the pole star. For example, about the time the pyramids were built in Egypt, some 4,000 years ago, Thuban, in Draco, the dragon, was the pole star. The head of Draco is right below Vega, and Thuban is the third star from the end of the tail which extends down toward Ursa Major, the great bear.

Star Triangle

Several interesting objects are revealed in Lyra by the telescope. For example, if you look closely at the constellation, you will find that there are two faint stars near Vega, forming with it an equilateral triangle. The northernmost star of the triangle is epsilon Lyrae, known as the "double-double." To a keen eye, or with a pair of binoculars, this star appears as two, while a small telescope shows that each of these stars in turn is also double.

And also in the same constellation, visible only with a telescope, is the ring nebula, called M. 57 after its number in Messier's catalog. It looks like a





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

smoke ring, but it is actually a globe of gas, which is made to glow by a star at the center. It is the most familiar example of the rather rare group of planetary nebulae.

Their name comes not from the fact that they have anything to do with planets, but merely because they look something like planets with a small telescope. Some, if not all, may be the remains of "new" stars—stars which in past ages have suddenly flashed out for a brief period with many times their normal brilliance. If this is the case, most of our present planetaries will have disappeared after many thousands of years, but others will by then have taken their places.

Celestial Timetable for September

Sept.	EWT	
2	4:21 p.m.	Full moon.
3	2:00 a.m.	Moon nearest, distance 220,000 miles.
9	8:03 a.m.	Moon in last quarter.
11	2:23 a.m.	Moon passes Saturn.
17	7:00 a.m.	Moon farthest, distance 252,700 miles.
	8:37 a.m.	New moon.
19	6:54 a.m.	Moon passes Venus.
22	7:00 p.m.	Mercury farthest west of sun.
23	12:02 a.m.	Autumn commences in northern hemisphere.
	1:00 p.m.	Mercury passes Jupiter.
25	8:07 a.m.	Moon in first quarter.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, August 26, 1944

GENERAL SCIENCE

Guggenheim Fellowships

➤ SIX SCIENTISTS are included among a group of 14 Latin-American scholars to whom Guggenheim Fellowship grants have been made. They will conduct research at various laboratories in the United States. Of the six, four are from Mexico and two from Argentina.

Three of the six Fellows in science are biologists. They are: Dr. Eduardo Caballero y Caballero of the National University of Mexico, who will conduct research in helminthology. Prof. Manuel Maldonado Koerdell of the University of Nuevo Leon, Mexico; he will work at the University of Kansas, in the field of comparative anatomy. Dr. Elisa Hirschhorn of La Plata, Argentina, whose researches on plant disease fungi will be carried on at the University of Minnesota and Harvard University. Dr. Rafael Aureliano Labriola, chemist at the University of Buenos Aires, will carry on studies of quantitative micro-analysis and of the techniques of hydrogenation at normal and high temperatures at the University of Minnesota and the University of Wisconsin.

Prof. Alberto Barajas Celis of the National University of Mexico will conduct mathematical research on the theory of gravitation at Harvard University.

Guido Munch Paniagua, calculator in the National Observatory of Mexico at Tacubaya, D. F., will pursue studies in the field of theoretical astrophysics at the Yerkes Observatory of the University of Chicago, at Williams Bay, Wis.

Guggenheim Fellowships usually carry a stipend of $2,000 for a year's study, plus additional sums to defray travel expenses. The Latin-American Fellowships were established in 1929.

Science News Letter, August 26, 1944

A postwar *under-water* tunnel to connect Copenhagen, Denmark, with Malmo, Sweden, is proposed; it would be 7½ miles long and have space for a two-lane highway and a one-way electric railway.

PUBLIC HEALTH

Polio Cases This Year Are Highest Since 1927

➤ INFANTILE paralysis cases throughout the nation continued to increase during the week ending Aug. 12. Latest reports to the U. S. Public Health Service show a total for that week of 1,015, compared to 932 for the preceding week and 545 for the corresponding week in 1943, which was a big polio year.

The total number of cases so far this year, 5,009, is higher than for any year since 1927, Public Health Service records show.

Increases were reported in North Carolina, New Jersey, New York, Ohio, Illinois, Michigan and Minnesota. New York reported the largest number, 356, including 108 from New York City. Cases decreased in Kentucky, Virginia, Pennsylvania and Maryland.

Science News Letter, August 26, 1944

Game species of *migratory water-fowl* in North America have increased nearly 400% in the past nine years.