



This month the honor is held by Vega in the easily found triangle of stars high overhead.

shorter, and the day is 20 minutes longer than the night. Not until the middle of October will the day and night be approximately equal.

At the time of the equinox, nowadays, the sun stands in the direction of the constellation of Virgo, the virgin, a group that we saw in the evening sky of early summer. But many thousands of years ago it stood at this time in the neighboring group of Libra, the scales, and it has been stated by some authorities that this figure was selected for these stars because they symbolized the supposed equality between daylight and darkness at this time of year. In very much the same way, the constellation of Leo, the lion, symbolized the power and glory of the sun, because it stood in that direction when at its highest, at the beginning of summer.

Harvest Moon

From about the 22nd, a day before the moon reaches first quarter, to the end of the month, the evenings will be moonlit. On September 3, at 4:00 a.m., the moon will be in perigee, or nearest the earth, at a distance of 224,700 miles. Its greatest distance of the month, "apogee," the astronomer calls it, will come on the 18th, at 8:00 p.m., when it will be 252,350 miles away. On September 22, the moon, just a day before first quarter and visible as a very full crescent, will pass Jupiter, about two and a half times its own diameter to the south. This will happen at 3:06 a.m., eastern standard time, when neither the moon nor Jupiter will be visible from most of the United States, but on the evening of the 21st the two bodies will be seen close together.

The full moon on September 30, is

known as the "harvest moon." On that night, at latitude 40 degrees north, it rises only 32 minutes later than the night before. In contrast, the full moon on March 8, rose nearly an hour later than it did on the 7th. This means that moonlit evenings continue for a longer period after full moon at this time of year, and this is supposed to be of help to the farmers in gathering their harvest. In latitudes farther north, the effect is much greater. At 60 degrees north, for instance, the moon rises only 10 minutes later on the 30th than on the 29th, though on March 8 it rose one hour 18 minutes later than on the 7th.

The moon will be at last quarter on Sept. 7 at 10:14 p.m., eastern standard time, new on Sept. 15 at 12:41 p.m., at first quarter on Sept. 23 at 5:12 p.m., and full on Sept. 30 at 4:01 p.m.

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SEISMOLOGY

4,000 Earthquakes a Year Is Average for Japan

FOUR thousand earthquakes a year! This is the average number of perceptible ones for all Japan. It is small wonder that that country has proved a fruitful laboratory for seismologists.

Recently the Earthquake Research Institute of the Imperial University of Tokyo, Japan, held an exhibition of instruments, apparatus, maps, diagrams, statistics, etc., commemorating the tenth year since the establishment of the Institute and the fifty-fifth year since the organized study of seismology began in Japan.

In 1880, the Seismological Society of

Japan was organized by American, English and Japanese scholars in Yokohama and Tokyo for the study of conditions preceding, accompanying, and following earthquakes. One of them, Sir James Alfred Ewing, later a principal of Edinburgh University, invented a horizontal pendulum seismograph in cooperation with Thomas Gray, who added a heavy bob suspended by a spiral spring with which to record vertical motion. The instrument which they worked out has been the model for seismographs ever since.

Dr. Mishio Ishimoto, director of the Institute, is the inventor of a number of instruments to aid in the study of earthquakes, chief among them being the tiltgraph and the accelerograph. With the tiltgraph, which has now been in use for eight years, it has been possible to prove the truth of the proposition of T. Terada, C. Tsuboi, and N. Miyabe, that the crust of the earth (at least in Japan) is composed of blocks. These blocks appear to be several miles in diameter; a general upheaval of the ground is produced by the combined motion of the blocks.

Movement Under Crust

As for the cause of an earthquake, while some scientists hold that it originates from a pair of sliding "faults," or deep crustal cracks, the findings of the Japanese scholars indicate, rather, a movement of the magma, or plastic matter, under the crust of the earth. Mr. Tanahashi of the Kobe Marine Meteorological Observatory, who is interested in the motions which initiate earthquakes, in the pushing waves and the pulling waves, has made a study of the distribution of initial motions; and he finds that a quake may start from several points at the same time, as, for example, in the deep-seated earthquake of June 2, 1931, when the source of motion was quadruple.

Inasmuch as Japan is traversed by six earthquake zones and has in the past 340 years suffered from 27 major earthquakes which took the lives of 161,822 people, it is to be expected that that country should be particularly interested in earthquake prediction. But, although statistics have proved the correlation between quakes and barometric pressure, its gradient, precipitation, tides, etc., these are only the trigger; and as the late Dr. Suyehiro remarked, "An unloaded gun cannot be fired by pulling the trigger." Part of the task ahead is to learn when the gun is loaded, and with what.

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