of spring occurs when the sun enters the sign of Aries.

Jupiter is the only planet that can be seen this month in the evening. It is a little south of the east point, and low in the sky about 9:00 p. m. It is brighter than any star. Spica, which marks Virgo, is just below. In the early morning hours just before sunrise Venus comes into view, also in the east, and during this month it is about as brilliant as it was in the western evening sky in the early winter, even exceeding Jupiter in magnitude. In fact, it is so bright that it can easily be seen in the daytime sky, if you know just where to look.

Saturn and Mercury are between Venus and the sun, but, being much fainter, they are very difficult to see. Mars passes directly in line with the sun this month and cannot be seen at all. During the coming months, however, he will come more and more into the night sky.

"By Jiminy"

Almost overhead can be seen the very interesting constellation of Gemini, the twins. Castor and Pollux are their names, with the latter, which is the brighter, to the south. They represented favorite deities of the Romans, especially the soldiers, who thought that these twins led them on to victory. They used to swear by them, and this oath still survives, in the slightly modified form, "by jiminy." This constellation also has the distinction of having had two new major planets discovered within its borders. In March of 1781, William Herschel, then organist of the Octagon Chapel at Bath, England, and an amateur astronomer, turned his little homemade telescope towards Gemini and discovered the body which later came to be called Uranus, one of the family of planets which revolves around the sun and includes our earth. Then in January, 1930, astronomers at the Lowell Observatory, Arizona, took a photograph of this part of the sky and on one of their plates found Pluto, the most newly discovered planet.

Castor is a beautiful sight through a moderately large telescope. Instead of the single star, which it appears to the naked eye, it is then shown to be a binary, that is, a star consisting of two separate orbs which revolve around each other. Such couples are not rare, for recent studies indicate that one star in every four is so constituted. The two bodies forming Castor take about 300 years to make a complete revolution and they are so close to the earth that their light takes only 43 years to reach us. Thus they are fairly close neighbors.

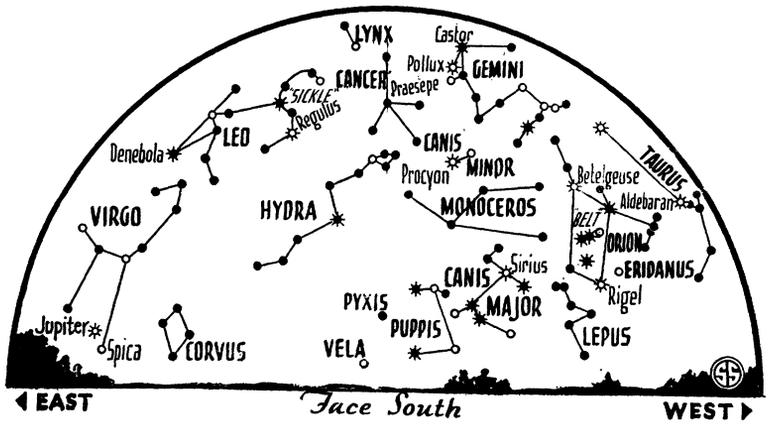
Castor has another claim to interest. It was in 1750 that the English astronomer, Bradley, discovered that Castor was a double star. Modern observations have revealed a third member of the group, a very faint star which goes around much more slowly, perhaps taking as long as 10,000 years. Even this is not the whole story, because the spectroscope, with which so many great astronomical discoveries have been made, shows that each of these three stars consists of a pair of stars, so close together that no telescope is powerful enough to show them as two distinct bodies. Thus the star which appears single to the naked eye really consists of at least six separate orbs.

Phases of Moon

During March the moon is full on the first, at last quarter on the 8th, new on the 15th and at first quarter on the 22d. Thus, there will be moonlit evenings during the first few days of the month, and from about the 20th to the end of the month. On the fourth the moon passes near to Jupiter, with the planet to the north.

Science News Letter, March 3, 1934

☼ ✷ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



PHYSICS

Shortest Radio Waves Measure Molecules

TWO University of Michigan scientists are using the shortest radio waves ever produced by radio tubes. These radio waves are less than a half inch long, as compared to the previous low of well over an inch and to the commonly used radio waves of about 1500 feet.

The waves are produced by electrical oscillations inside a tiny vacuum tube. The anodes or positive plates of the tube are made from graphite cylinders only three-tenths of an inch in diameter. The wave-length of the radio waves produced by the tube depends upon the time it takes the electrons to travel from the filament located in the center of the inner walls of the cylinder.

The whole vacuum tube is placed in a strong magnetic field, which also influences the wave-length of the waves produced. The stronger the magnetic field, the shorter the waves.

The Michigan physicists, Drs. C. E. Cleeton and N. H. Williams, measured the wave-lengths of these ultra-short radio waves by reflecting them from two brass mirrors three feet in diameter to concentrate the energy and spreading them out in a spectrum by means of a grating or set of finely ruled lines on a polished surface. The waves, after being focussed by the second mirror, fell on a crystal detector that amplified their electrical energy.

Perhaps the most striking thing about this experiment is the partial closing of the gap between the far infrared rays and the shortest radio waves. This gap has so far been the most difficult for the experimenter to close and this advance has decreased the radio waves by at least two octaves.

The production of these ultra-short waves, a feat in itself, was but a part of the accomplishment of the two physicists. The waves were passed through a rubberized cloth bag full of ammonia gas which absorbed a certain wavelength of the band of waves to an abnormal degree. From their measurements on this absorbed wave-length the scientists were able to show that the ammonia molecule has an apparent diameter of about 3½ hundred-millionths of an inch (0.000000035 inches). That is, 100,000,000 ammonia molecules in a chain would be only 3½ inches long.

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