

ASTRONOMY

Vega Shines Brightest

Planets are not well placed, but Mars, Jupiter and Venus are visible. Sept. 23 is the centenary of the first observation of Neptune and begins autumn.

By JAMES STOKLEY

➤ ALTHOUGH the planet Venus reaches its greatest distance east of the sun on Sept. 8, it will not then occupy the position high in the western sky that it normally does under such circumstances. However, it can easily be seen low in the southwest at dusk, with magnitude of minus four, much more brilliant than any other star or planet. The poor position of Venus comes from the fact that it is far south. Thus, its great distance from the sun merely takes it along the horizon, and not up into the sky.

Because it sets so soon after the sun, Venus does not appear on the accompanying maps, which indicate the sky's appearance for 10:00 p. m., standard time on Sept. 1, and an hour earlier in the middle of the month.

Brightest star shown on these maps is Vega, in Lyra, which is high in the west, almost overhead. Directly overhead is the figure of Cygnus, the swan, with first magnitude Deneb. Altair, in Aquila, the eagle, is a little to the south.

In addition there are three other stars shown which are of the first magnitude but all are down near the horizon, where the atmosphere through which their light has to travel on the way to us causes a diminution in their brilliance. Low in the southeast is Piscis Austrinus, the southern fish, with Fomalhaut. To the northwest is Arcturus, in Bootes, the bear-driver. Capella, in Auriga, the charioteer, is in the northeast, reappearing after several months' absence from our night time skies. During the winter it will come into greater prominence.

Mars and Jupiter Visible

Mars and Jupiter also are in the sky in September, and in the figure of Virga, the same as Venus. However, they are even closer to the sun than Venus. For that reason and because they are fainter they are still harder to see. On Sept. 3 Venus passes Jupiter, so that they will help locate it. Mars passes Jupiter on the 24th. Jupiter is of magnitude minus 1.3 which

exceeds any of the stars but Mars is fainter, even, than any of the six stars mentioned above, with magnitude plus 1.8.

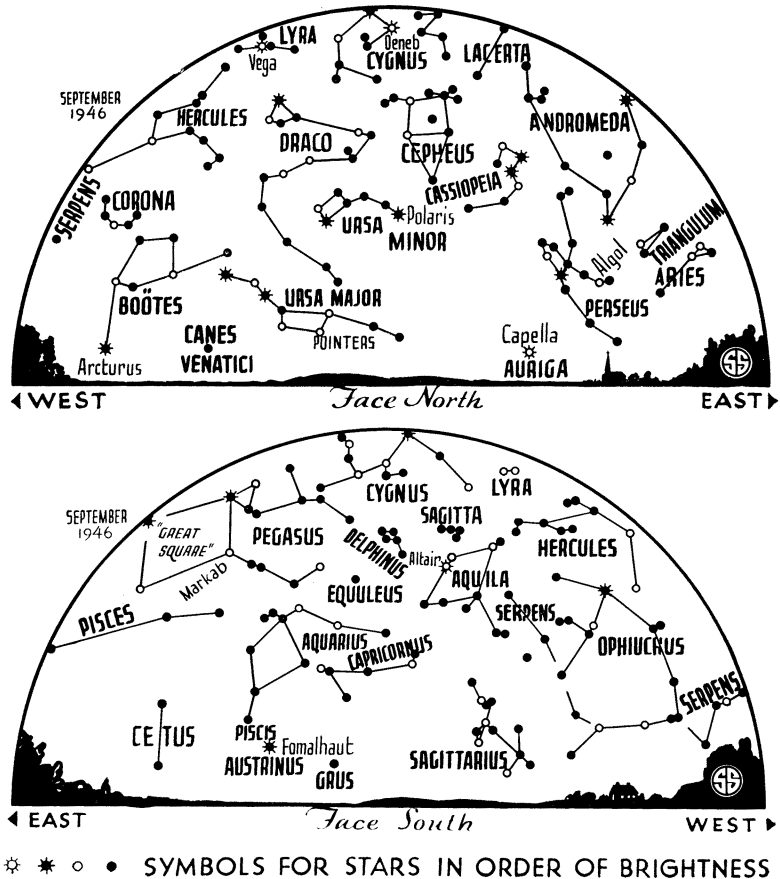
Though nothing happens in the sky on that date, Sept. 23 is important in the history of astronomy, especially this year, since it is the centenary of one of the greatest discoveries in science—and one that involved quite dramatic circumstances. It was on Sept. 23, 1846, that the planet Neptune was first observed, after its presence and position had been predicted by unprecedented mathematical techniques.

The theory of gravitation, which was published by Isaac Newton in 1687, had shown that this force acts throughout the universe and that each of the planets exerts an attraction on all the others. Thus, in calculating the orbits of the

planets, the movements of the others had to be considered, but this was done with great success.

In 1781, using a small telescope which he had made himself, William Herschel, in England, discovered the planet Uranus. This was actually the first planet to be "discovered," since all the others are visible to the naked eye and had been known from antiquity. After Uranus had been observed for several years astronomers calculated its orbit and found that it revolves around the sun once in 84 years, at an average distance of 1,800,000,000 miles.

However, early in the nineteenth century, it was found that there were some discrepancies in its motion. Even allowing for the attraction of the other known planets it did not go quite where it was expected to travel. This kept getting worse and worse, until by 1845 it was about two minutes of arc out of place. This is only about a fifteenth of the moon's apparent diameter, but an amount that is astronomically intolerable.



It was about this time that two astronomers, a 26-year-old Englishman named John Couch Adams, and a Frenchman, Urbain Jean Joseph Leverrier (aged 34 years), independently came to the conclusion that this was caused by a still more distant, and undiscovered, planet, of which the gravitational pull had not been considered.

Unprecedented Problem

Knowing where a planet was, astronomers had worked out the technique of ascertaining its perturbations on other planets, but the idea now was to do the reverse and, from the perturbations, to figure out the place of the planet that caused it. This was an exceedingly difficult and unprecedented problem, but in September, 1845, Adams finished some preliminary results and sent them to Prof. Challis, at Cambridge. A month later he had his final results, which gave the supposed position of the unknown planet, and sent these to Sir George Airy, the Astronomer Royal, at Greenwich.

Ignorant of this work, Leverrier in November, 1845, gave a preliminary paper in which he showed that the effects of the then known planets were not sufficient to explain the curious movement of Uranus. On June 1, 1846, he followed this with a second paper, giving for the disturbing planet a position that was within a degree—about two moon diameters—of the place where Adams had placed it.

On Sept. 3 Adams sent Airy a third paper, giving revised results, but still nothing was done about it. At first, apparently, the English astronomers had not a very high opinion of Adams' work. Also, there was the difficulty of locating the faint and moving planet among a horde of fixed stars. This was before the modern days of photography, when two plates, exposed on succeeding nights, would quickly reveal the wandering object.

A few weeks before this Leverrier, likewise, had issued a third paper, but this did not reach England until the end of September. When it did, and the English astronomers noticed the similarity to Adams' figures, they evidently had more respect for them and began to make observations with a view to locating the wanderer. But it was too late. A copy of the Leverrier paper reached J. G. Galle, at the University of Berlin, on Sept. 23.

Fortunately, he happened to have a new star map covering the region of Aquarius, where the planet was supposed

to be, and showing the permanent residents of that constellation. This would make it easy to find the stranger. The night was clear, he turned his telescope towards Aquarius, and there it was!

Discoverers Share Honors

Naturally, there was great controversy between England and France as to who had discovered the planet, but now history's version is that both Adams and Leverrier share the honors—along with Sir Isaac Newton, whose genius, as Alfred Noyes has said, "found the law that was a lantern to their feet."

In September Neptune is in the constellation of Virgo, and too close to the sun to be observed, even with a telescope. Its magnitude is about 7.7 well below the limit of naked eye visibility. It travels once around the sun in 165 years, at a distance of 2,793,000,000 miles. Its diameter is 31,000 miles, and it is equipped with one satellite, probably bigger than our moon.

Celestial Time Table for September

Sept.	EST	
3	9:49 a. m.	Moon in first quarter
	2:00 p. m.	Moon farthest; distance 251,100 miles
8	10:00 p. m.	Venus passes Jupiter
	10:00 a. m.	Venus farthest east of sun
11	4:59 a. m.	Full moon
16	5:00 a. m.	Moon nearest; distance 229,400 miles
18	1:44 a. m.	Moon in last quarter
20	10:36 p. m.	Moon passes Saturn
23	10:41 a. m.	Autumn commences
24	11:00 p. m.	Mars passes Jupiter
25	3:45 a. m.	New moon
27	8:13 a. m.	Moon passes Jupiter
28	10:35 a. m.	Moon passes Mars
	7:26 p. m.	Moon passes Venus

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 31, 1946

RADIO

New Insect Repellent Is CBS Radio Feature

➤ A NEW double-action repellent called 448 that both repels and kills insects will be described on the Science Service radio program, "Adventures in Science," over many of the stations of the Columbia Broadcasting System next Saturday, Sept. 7.

Lieut. Comdr. Michael Pijoan of the Naval Medical Research Institute will be the guest of Watson Davis, director of Science Service, on the program.

The program will be heard at 1:45 p. m. EST., 2:45 p. m. EDST.

Science News Letter, August 31, 1946

MEDICINE

Insulin Aids in Treatment of Alcoholics

➤ ACUTE alcoholics, treated with insulin, can be lured away from drink twice as fast and with greater ease and comfort than by the usual method of gradually withdrawing alcohol from the diet, Dr. Etem G. Vassaf and Dr. Volta R. Hall, of the Ring Sanatorium and Hospital, Arlington, Mass., have found.

Small doses of insulin were given two or three times daily before meals to 43 patients whose "lost weekends" varied from two days to three months. The patients, 29 of whom were men and 14 women, were forced to drink plenty of fruit juices, in a diet of high-calorie and high-vitamin foods. Those who showed signs of tremors, excessive sweating, confusion, or disorientation, were also given injections of vitamin B₁.

Of the patients, 44% required no alcohol after receiving insulin, while in a group of 564 patients who were not given insulin, only 14% could give up whisky at once. The average withdrawal period for the insulin patients was one day, slightly less than half the 2.2 days required by the average alcoholic receiving no insulin.

Nursing and medical staffs agreed that the patients receiving insulin were more contented and cooperative, less restless and fault-finding, and less insistent in their demands for alcohol than were the control patients.

Scientists have long known that the burning of alcohol and its consequent disappearance from the body may be speeded by the catalytic action of simultaneous oxidation or burning of sugar. Drunks, completely "out" in a serious alcoholic coma, have been sobered up in two hours or less and able to walk alone within four hours by injection of both sugar and insulin.

Insulin, administered alone, will speed up the oxidation of blood sugar, otherwise dormant when alcohol is present, and this, in turn, speeds up the elimination of the alcohol itself.

Drs. Vassaf and Hall, reporting their studies to the *New England Journal of Medicine* (Aug. 8), suggest greater future use of insulin in treatment of acute alcoholism.

Science News Letter, August 31, 1946

Ascarids, internal parasitic worms, may be 90% destroyed without injury to swine, by sodium fluoride in their food.