

ASTRONOMY

Watch Venus and the Perseids

Beautiful Planet Reaches Maximum Brightness on August 2; Meteors Expected on August 11 or 12

By JAMES STOKLEY

SINCE the last day of June, Venus has been drawing between earth and sun, and setting sooner and sooner after the sun has dipped below the horizon. Because it appears only by reflected sunlight, the illuminated hemisphere of Venus has been turning away from us, and through a telescope it's now a crescent, like the moon a few days after new. At the end of June the planet was at the distance of the sun, 93,000,000 miles. On the first of August it has approached to 42,415,000 miles, and on the 31st of the month it will be only 27,499,000 miles away. On September 8 it will come between us and the sun, when it will be closest, a distance of only 26,428,000 miles, nearer than any other planet can ever approach. But this close visit does not do us much good, because Venus cannot be seen in the sun's glare. At very rare intervals it comes directly between the sun and earth and is seen while in transit across the solar disc. The last transit of Venus was in 1882, the next will be in 2004, but even then it will just be a black spot, and no detail can be seen on the planet.

Earth Bright to Venusians

If there were any astronomers on Venus, however, and they could penetrate the layer of clouds that seem perpetually and completely to cover its surface, they would now have an excellent view of earth, better than we ever have of any other planet. To them earth would appear about six times as bright as Venus appears to us at the beginning of this month, when most brilliant. They would also see the moon, as bright as Jupiter to us, swinging every month to one and the other side of earth, so that the two would look like a double planet, the most striking object in the Venusian skies.

The accompanying diagram shows the way Venus changes its phase. Last winter, when beyond the sun, we could see its entire bright hemisphere, and it appeared as a complete circle, as shown in the first figure. On June 30 it looked as in the second, and as it had then come over 60,000,000 miles closer to us, it ap-

peared much larger. Because it was increasing in size more rapidly than the bright half was turning away from us, it was waxing in brilliance. During July it became still brighter, and on August 2 will reach its maximum, when, through the telescope, it will appear as in the third figure. Towards the end of August, when closer yet, it will look like the fourth, but by that time the crescent will be so narrow that it will be much fainter than at the beginning of the month. Also, it will be so nearly in line with the sun that it will be out of view. By early October, however, it will have moved to the western side of the sun, when it will rise before the sun, as a morning star, and will go through the same changes in reverse order.

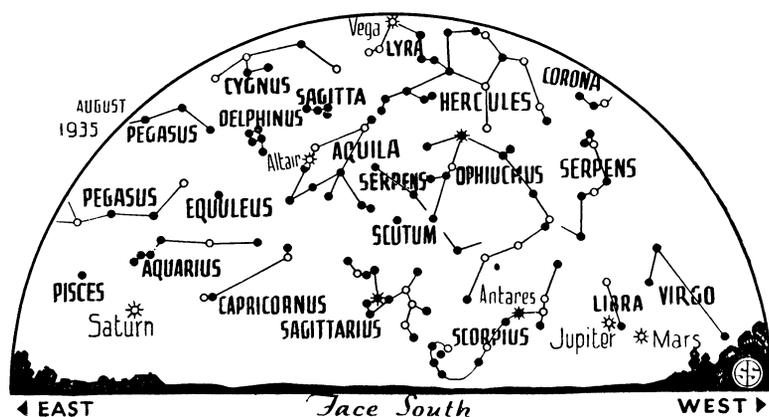
Though Venus disappears from view during August, still there will be three planets visible at once after dark, for Saturn has now appeared in the east, to take the place of his departing sister. Low in the southwest appear Jupiter and Mars close together, the former easily identified because it is the brightest star or planet seen after Venus has set. It is a very short distance above the star Zuben Elgenubi, in the constellation of Libra, the scales. The accompanying maps, which show the appearance of the heav-

ens at 10:00 p. m., standard time, on the first, 9:00 p. m. on the fifteenth and 8:00 p. m. on the 31st, give the relative positions of these two planets at the middle of the month, when Mars is still to the west. On August 27 Mars, moving easterly through the sky, will pass directly south of Jupiter, about four and a half times the moon's diameter away from his brighter brother.

While Venus is so close to the earth, the other planets in the evening sky are much more distant. Mars has receded to 120,510,000 miles, on the 15th, while at that same time Jupiter will be 501,630,000 miles away and Saturn 814,080,000 miles. Mercury will be behind the sun on August 9, and not visible. Its distance will be 126,260,000 miles.

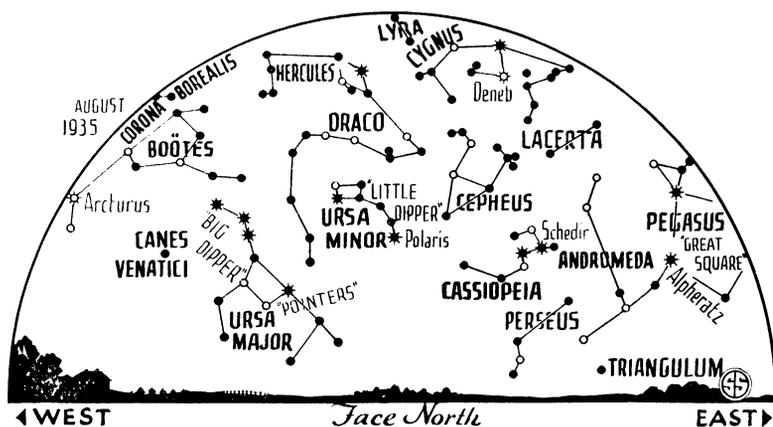
The moon and the planets move about the sky in similar paths, and once a month it passes each of them, making a striking sight when they are close together. During this month it passes Venus on the second, a little over three times its own diameter to the south and in a crescent phase, three and a half days past new. The two will be in conjunction when closest, at 7:41 p. m., eastern standard time. The moon passes Mars on the 6th, Jupiter on the 7th and Saturn on the 15th, but in each case a distance of at least eight times the lunar diameter will separate them. The moon's distance changes during the month. On August 2 it will be at apogee, farthest away, at 252,250 miles, then it approaches to

* * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



THREE PLANETS

Low in the west this month you may see bright Jupiter and ruddy Mars both shining in the single constellation of Libra, while in the southeast Saturn makes its appearance.



WHERE TO LOOK FOR METEORS

From the constellation of Perseus in the northeast just below the W-shaped Cassiopeia, the Perseid meteors appear to radiate, falling at the rate of nearly one a minute.

223,100 miles on the 15th, or perigee. On the 29th it will again be at apogee, 500 miles more distant than on the second.

The moon will be at first quarter on August 7 at 8:30 a. m., eastern standard time, will be full on August 14 at 7:44 a. m., at last quarter on August 20 at 10:17 p. m. and new again on August 28 at 8 p. m.

Libra, ordinarily a rather inconspicuous constellation, can be found easily this month, with two planets, Mars and Jupiter, in it. Ages ago, however, this was not a separate star group, but part of Scorpius, the scorpion, next-door to the east. In fact, the curious names of the two brightest stars in Libra recall this fact. In addition to Zuben Elgenubi, we have Zuben Eschemali, which are Arabic words meaning, respectively, the southern claw and the northern claw. Even though in Roman times the scorpion's claws were shortened to make another constellation, the old star names continue.

Easily Recognized

The scorpion itself is very easily recognized as he shines above the southern horizon on these August evenings. The curved row of stars to the right now represents his claws, and the hook-shaped line of stars to the left form the tail. Following him is Sagittarius, the archer, which resembles a tea-pot, the spout nearest the scorpion's tail. Next to the archer is Capricornus, the sea-goat, not very prominent, and he is followed by Aquarius, the water bearer, in which Saturn shines at about the same brilliance as Mars.

The brightest star now seen in the evening is Vega, in the lyre, Lyra, shining directly overhead. To the northeast is Cygnus, the swan, also called the north-

ern cross, while to the southeast of Vega, Altair appears, in Aquila, the eagle. If you are away from city lights, you can see, running through this same part of the sky, the Milky Way. It is the broad pathway of light consisting of the combined illumination of myriads of stars in the same direction, each too distant to be seen separately. In the west is Boötes, with bright Arcturus, and near the horizon to the right of Mars is Spica, in Virgo, the virgin.

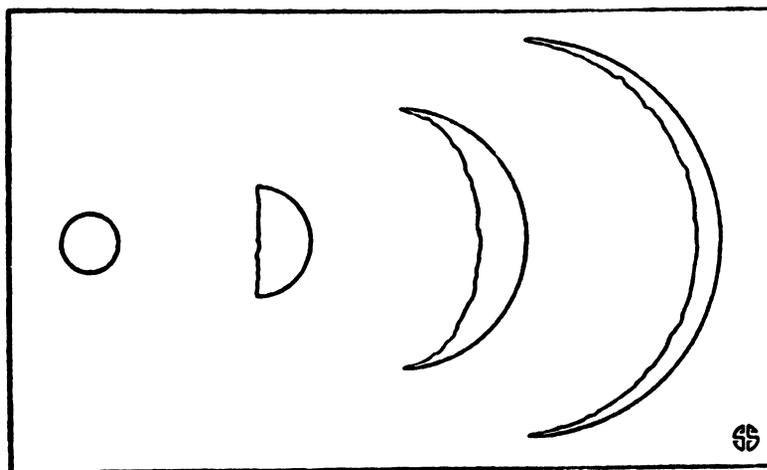
Just above Arcturus is the pretty little semicircle of stars forming Corona Borealis, the northern crown, which some of the American Indians pictured as a council of chiefs seated around a campfire. Hercules, the great strong man of mythology, can be seen between Corona

and Lyra. To his south is Ophiuchus, the serpent carrier.

The great dipper, part of Ursa Major, the great bear, is in the northwest, while Cassiopeia, queen of Ethiopia, seated on her throne, is in the northeast. Directly east, resting on one corner, is the "great square of Pegasus," three of the stars of which are in this constellation, the winged horse. The fourth, to the left, is part of the neighboring constellation of Andromeda, the lady chained to the rock.

On any clear night of the year, if you watch the sky long enough, you will see a few shooting stars, or meteors, but at certain times they are much more numerous. One of these times of a meteor shower occurs this month, particularly August 11 and 12. More meteors can always be seen after midnight than before, so if one stays up rather late on these nights and watches the northeastern sky, he may be rewarded by seeing meteors at the rate of nearly one a minute. Unfortunately, the moon will be full on the 14th, and at the time of the shower will be in the sky most of the time. Its glare will hide the fainter meteors, but a great many should be seen despite it. If their paths are plotted, they will all seem to emerge from the constellation of Perseus, which is seen in the northeast about midnight, and for this reason the ones appearing in August are called the Perseid meteors.

The Perseids do not really radiate from this part of the sky, but are moving in a great swarm around the sun in parallel paths. Every August we cross this path, and as they enter the earth's atmosphere



VENUS HAS ITS PHASES, TOO

This diagram shows how the planet Venus changes its phases. Last winter, when farther away from the earth than is the sun, Venus appeared as a complete circle like the first figure on left. On June 30 Venus was 60,000,000 miles nearer the earth and appeared much larger, as does the second figure from left. On August 2 it reaches maximum brightness and appears through a telescope like the third figure. Toward the end of August it is even closer to the earth, but by that time its crescent is so narrow (fourth figure) that the planet is much fainter than it was at the beginning of the month.

and are arrested in their progress by friction with the air, they are heated, and disappear in a flash of light. The effect of radiating from one point is one of perspective. Their paths seem to converge in the distance like the parallel tracks of a railroad.

That the Perseid meteors are associated with Tuttle's comet, which was last seen in 1862, was the discovery of a distinguished Italian astronomer the centenary of whose birth was commemorated earlier this year. Giovanni Schiaparelli was born March 14, 1835, and died in Milan on July 4, 1910. In 1866 he showed that the path of the Perseid meteors corre-

sponds exactly with that of Tuttle's comet, so there now seems no doubt that the meteors are the remains of the comet. Since that time the relation has also been shown for other comets and meteor showers. Schiaparelli is also known for his discovery of the peculiar straight markings on Mars, which he called "canali," meaning "channels," but which have always been mistranslated into English as "canals," thus implying an artificial origin, though this is seriously questioned. His name is well known today, though in a very different field from astronomy. His niece has achieved fame as a dress designer in Paris.

Science News Letter, July 27, 1935

PSYCHOLOGY

General Scientific Ability Believed Non-Existent

IS THERE a scientific type of mind? Does the great chemist who studies the building matter of the world share with the astronomer who searches out nebulae beyond our galaxy some special talent setting them apart from their fellow men?

A British psychologist has weighed this problem and gives the encouraging answer "No."

"No child should be denied the right to receive a scientific education," declares Gordon A. Jahans (*Discovery*, June). "Every child is capable, within the limits of his general intelligence, of performing the mental processes involved in scientific thinking."

Intelligence Mr. Jahans likens to a boiler which gives energy to all the different sorts of mental activity that must be engaged in by the scientific man. But beyond this common source of power no "general scientific ability" exists to be shared by physicist and chemist, by botanist and physician.

Novel tests were prepared by Mr. Jahans to reveal an individual's ability to do scientific thinking. Mathematical ability and language ability, which are known or thought to be special talents, were left out of these tests by the expedient of using no words or number problems but only colored patches and forms of various sorts. Two of the problems were concerned with the classification of the forms according to given schemes.

In one set the task was comparable to that of the botanist who must sort out a group of leaves according to whether

they are simple or compound, smooth-margined or toothed.

In the other set the task was more like that of the physician who must look for a certain set of signs or symptoms and note how many and which are present in a given set.

These tests were given to a number of children. After allowance had been made mathematically for their general intelligence, no relationship was found between ability on one of these tests and ability on the other.

The human mind evidently holds no special department equipped for the solution of scientific problems. If your son is a bright boy and he wants to be a scientist, the field is his.

That is the conclusion of Mr. Jahans. Another interpretation of his results seems possible, however. It may be that the great botanist achieves his distinction because he possesses individual qualities differing not only from the mental traits of the unscientific, but also from those of the physician and all other scientific men.

Perhaps every child does have a special "bent." If he has within him the making of a chemist, it may be that training could never make of him an astronomer great enough to equal his potentialities in his own field.

Science News Letter, July 27, 1935

The earliest astronomer, physicist, and clockmaker in the history of science, says Dr. J. H. Breasted of the Oriental Institute, was Amenemhet, who lived about 1550 B.C. in Egypt and left his autobiography on his tomb-chapel wall.

ENGINEERING

Clean Disposal of Waste Provided by Food Grinder

ELIMINATION of the garbage can, with its unpleasant accompaniments of flies, ants, odors and stray pieces of decaying food, is foreshadowed by the invention of an electrical device disposing of waste food by way of the kitchen sink.

Driven by a small electric motor taking current from the house circuit, the device, developed by the General Electric Company, reduces waste foods to a fine pulp which washes down the drain into the sewer without clogging. Everything from watermelon rind to soup bones can be shredded and macerated, the only exceptions being bottles and tin cans. Tests trying out the device over the period of a year in a number of ordinary homes, including that of Morris Cohn, sanitation engineer of Schenectady, failed to discover any weaknesses. All kinds of food were handled with ease, and no drawbacks developed. The extra amount of water used in flushing was negligible, amounting to but one per cent. From the standpoint of use of electricity, the average cost of operation per month is about half that of an electric clock. Grease and oily substances coagulate and pass through the pipes without clogging or coating, it is claimed.

The grinding unit weighs about 75 pounds, and the grinding knives are made of carbolay, an alloy metal of extreme hardness. Operation is very simple, requiring not more than five minutes a day.

Disposal of garbage by grinding it and washing it down the drain is not quite as simple as it sounds, according to Public Health officials and sewage disposal experts in Washington. There would be no Federal or state objection to such a method, which has many advantages, but its success would depend upon two important local factors. The first is the ability of local sewer pipes to handle the added solid material without "sludging up" and second the capacity of the local sewage plant in regard to disposal of solid matter. In localities where the sewage is dumped into the river without treatment there might be problems caused by settling sediment in tripled amounts.

Providing these objections can be overcome, the consensus seems to be that the plan might have possibilities, although all stressed that it is entirely a local matter for consideration individually by each town or municipality.

Science News Letter, July 27, 1935