ASTRONOMY

Mercury Makes Bow

Innermost planet, seldom seen, comes into view around April 5. Best chance of year to view Mercury, farthest east from sun on that day, comes just at twilight.

By JAMES STOKLEY

➤ IN ADDITION to Venus and Saturn, which are now conspicuous in the evening sky, the seldom-seen planet Mercury will come into view for a few evenings before and after the fifth of April. This will be the best chance of the year to see it.

On the fifth, Mercury is farthest east of the sun, and remains visible for the longest time after sunset. The planet sets about one hour and a half after the sun, just as twilight is ending, so it will not be seen in a fully dark sky. However, if you look toward the west, near the horizon as dusk is gathering, it should be visible perhaps as late as the twelfth. Do not confuse it with Venus, which will be considerably higher and brighter. But after you have found Venus, look for Mercury, along a line extending from Venus to the brightest part of the horizon. It will not be difficult to find.

Because Mercury sets so early in the evening, it is not shown on the accompanying maps, as these depict the sky as it looks about 10:00 p. m. at the beginning of April, an hour earlier at the middle and two hours earlier at the end of the month.

The third planet of our April evenings is Saturn, which is shown in the constellation of Virgo, the virgin, high in the southeast. It is as bright as a first magnitude star and about half as bright as Mercury. Venus, with minus 3.5 magnitude, exceeds Saturn in brilliance by some 60 times.

Moon Passes

You will find it interesting to watch the moon pass these planets. It overtakes Mercury on the evening of the seventh. The moon then is a narrow crescent, less than two days past new. It passes Venus in the morning hours of the ninth, when both objects are below our horizon. However, the now larger crescent will be seen below the planet on the evening of April 8, and above it on the ninth. Not until the morning of the 19th does the moon, nearly full, pass Saturn.

On April evenings the bright stars of winter are still with us, though with but a fraction of their earlier glory. For instead of shining high in the south, they are seen low in the west, getting ready to disappear from the evening sky until next winter. Directly west is Orion, recognizable as usual by the three stars in a row that form the warrior's belt. Betelgeuse is the star above the belt, while Rigel (not shown on the maps) is below. To the left of the belt stars is Canis Major, the great dog, with Sirius, the dog-star. To the right, near Venus, is Aldebaran in Taurus, the bull.

Above Taurus is Auriga, the charioteer, with first-magnitude Capella. Still higher, directly over Orion, we see Gemini, the twins, with Pollux the brightest star. Above Canis Major is Canis Minor, the lesser dog, with the star Procyon.

Leo in the Spring

High in the south is a constellation that is characteristic of spring evenings—Leo, the lion. The six stars in the western part of this group form the "sickle," with Regulus at the end of the handle, pointing downwards. The blade of the sickle, which points toward the southwest, is also the head of the lion. Next to Leo, toward the east, is Virgo, in which Saturn shines. This figure also contains a first-magnitude star, called Spica.

Above the eastern end of Virgo is the star Arcturus, in the constellation of Bootes, the bear-driver. The bear that he is driving is represented by the constellation of Ursa Major, the great bear, which is high in the north. The well-known "Big Dipper" is part of this stellar grouping and makes it easy to locate. In the bowl of the dipper are the "pointers," whose direction indicates Polaris, the pole-star, lower in the sky. The latter is at the end of the handle of the little dipper, which in turn is part of Ursa Minor, the lesser bear.

Winding around the little dipper is the snake-like figure of Draco, the dragon. Just below the pointers is the star marking the end of its tail, while the quadrilateral of stars low in the northeast is the head. Just below this is shown the star Vega, in Lyra, the lyre. Though Vega is first magnitude, its low position here makes it seem much dimmer, about equal to a fourth-magnitude star. Next summer it will shine high overhead, brightest star of the evening.

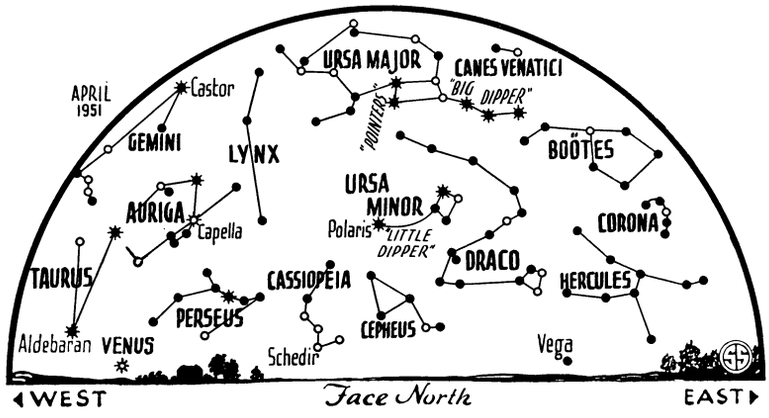
Of all the planets that can be seen with the naked eye, Mercury is by far the most difficult to observe. Mars, Jupiter and Saturn may be located so as to be visible at any time of night. Venus, though never in the sky at midnight, remains long into the evening or appears well ahead of dawn. But Mercury is seen, if at all, only in the morning or evening twilight.

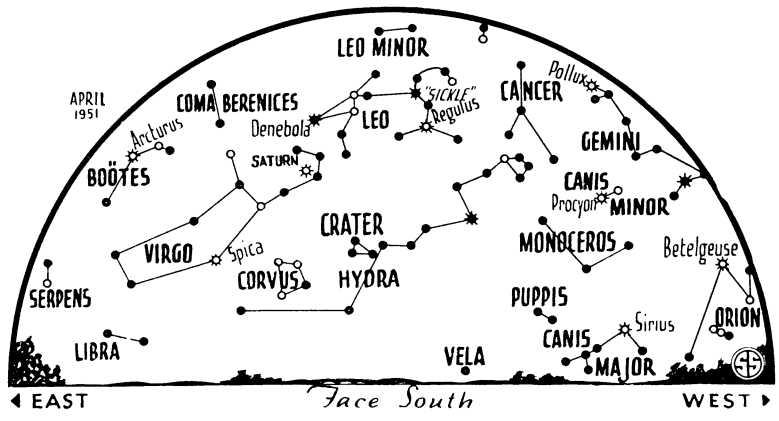
The reason for this is that Mercury, innermost of the planets, is at a mean distance of 36,000,000 miles from the sun, compared with 67,000,000 miles for Venus and 93,000,000 miles for earth. However, the orbit of Mercury is much more eccentric than that of either of the other two. It may approach the sun as closely as 28,600,000 miles, or recede as far as 43,400,000 miles.

Revolution of Mercury

Mercury goes once around the sun in 88 days, instead of the 365.256 days of earth, which means that while the former has been making one revolution, the latter has made about a quarter of a revolution, so that Mercury has to go still farther to catch up to us. It does so every 116 days. Once in this period it is on the same side of the sun as we are. Then it swings to the west and is a morning star, rising in the east before sunrise. Next it draws behind the sun and then reappears to the east of that body. When it gets farthest east, as it does on April 5, it is visible for a few days in the evening after sunset.

Greatest eastern elongation is the name given by astronomers to the time when Mercury is thus farthest east of the sun. If this happens to come at the same time that the planet is the greatest distance in miles from the sun, then, of course, it





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

remains visible for the longest time after the sun has gone down. At the elongation on April 5, however, Mercury will be only 30,800,000 miles from the sun, considerably less than average.

Mercury Above Sun

What makes this a favorable time to see Mercury is that it is in the spring. As seen from the northern hemisphere, Mercury at eastern elongation is now almost directly above the sun, and its distance away from that orb is most effective in delaying its setting. On the contrary, when a greatest eastern elongation happens in the autumn, as it will on Nov. 28 this year, it may be as far from the sun, but instead of being above it, is well to the left. Thus it descends below the horizon a relatively short time after sunset.

In its physical characteristics Mercury seems a most unpleasant place, judged by terrestrial standards. Just as the moon always keeps the same hemisphere toward earth, Mercury apparently keeps one half always towards the sun. This half therefore gets very hot, up to 660 degrees Fahrenheit, which is above the melting point of lead. This has been determined from measurements of radiation from the illuminated part of the planet.

One Side Always Dark

From the dark side, on the other hand, no radiation whatever has been detected. This leads astronomers to conclude that this area never turns sunward, otherwise some heat would be stored there. The temperature on this hemisphere is probably close to 460 degrees below zero Fahrenheit, the absolute zero of space.

One reason for the high temperature of the illuminated half of Mercury is found in its proximity to the sun. At a distance of a little more than a third that of the earth, it gets about seven times as much heat as we do. And in addition there is no atmospheric layer to afford even partial protection from the sun's heat and glare.

Celestial Time Table for April

April	EST	
5	3:00 p. m.	Mercury farthest east of sun, visible as evening star low in west after sunset for a few days around this date
6	5:52 a. m.	New moon
7	9:26 p. m.	Moon passes Mercury
8	3:00 p. m.	Neptune nearest, distance 2,722,000,000 miles
9	7:53 a. m.	Moon passes Venus
11	8:00 p. m.	Moon farthest; distance 251,600 miles
14	7:55 a. m.	Moon in first quarter
19	9:13 a. m.	Moon passes Saturn
21	4:30 p. m.	Full moon
23	6:00 p. m.	Moon nearest, distance 225,200 miles
24	11:00 p. m.	Mercury between earth and sun
28	7:17 p. m.	Moon in last quarter

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, March 31, 1951

BIOLOGY

No Fungus, No Potatoes For Dinner Tonight

➤ THE POTATOES in your dinner tonight probably would not have grown at all without the help of a fungus. This possibility was put forth by three scientists who have tried unsuccessfully to grow potato tubers—the fleshy part of the plant that we eat—without this fungus.

G. H. Rieman, D. C. Cooper and R. W. Hougas, of the University of Wisconsin, tested 16 varieties and strains of Wisconsin potatoes as well as samples from seven other states. The fungus appeared in every potato, no matter where or how it was grown.

Their finding fits in with discoveries that there are foreign micro-organisms in many plants. An orchid, for instance, cannot grow at all without first being inoculated with a fungus.

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ENGINEERING

Electronic Devices Serve as Inspectors

➤ SO-CALLED inspectors in machine shops are being replaced by mechanical and electronic devices that can sort, count and measure faster than humans, and with more accuracy, the American Society of Tool Engineers was told by A. C. Sanford, Federal Products Corp., Providence, R. I.

An important job of the inspectors is to measure the products as they come from the machines and operators to see that they conform to the particular measurements required. The mechanical or electronic devices that are now taking over the job use mechanical movement, air pressure, electrical or magnetic currents, or even radioactive carbon from an atomic pile, he stated. They are capable of millionth-inch accuracy, he said, and they relieve operators of the tedium of repetitive operations.

One new way of applying the gaging device is to attach them directly to production machines, he explained. Here, by automatically adjusting the machines so that they will produce only acceptable parts, the gages eliminate the need for inspection altogether.

Continuous abrasive belts for grinding, to replace milling machines on certain jobs, was recommended to the tool engineers by W. A. Papworth, Porter-Cable Machine Co., Syracuse, N. Y. In addition to the advantage of higher speeds on many jobs, abrasive-belt machines cost only a fraction of the machines they replace.

He cited many instances in which both production and product quality had been improved by abrasive-belt grinding. In finishing the flat surface of an aluminum die casting, a milling machine produced 37 pieces per hour, but an abrasive belt grinder produced three times as many.

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