

ASTRONOMY

# Mercury Appears Briefly

Seldom-seen innermost planet will be visible for a short time in April. Discrepancy in its movement can now be explained by the relativity theory.

By JAMES STOKLEY

➤ MERCURY, the innermost of the planets, and one that a great majority of people have never seen, will make one of its brief appearances in April. If you would be a member of the lodge of those who have viewed this little world, look toward the western sky just after the sun has set on April 12. As the sky darkens you may see the planet, looking like a star of the zero magnitude, just a little north of the west point. It will be near the horizon. Even at sunset on the 12th it will only be about 16 degrees high, and that is roughly the angular distance from the tip of your thumb to the tip of your little finger, when they are spread as far apart as possible and held at arm's length. By the time the sky is dark enough to show Mercury, it will have descended lower, due to the rotation of the earth. And about an hour and three-quarters after sunset Mercury will also be below the horizon.

This means that if you want to see Mercury, you have to have a clear sky toward the west. However, its visibility will not be confined only to the 12th, as it should be nearly as well seen for a few days before and after that date.

Mercury is not shown on the accompanying maps, as it sets before the times for which they are prepared. This is 11:00 p. m., your own war time, on April 1, and 10:00 p. m. on the 15th. On them are indicated three other planets which are visible to you, in case you miss Mercury.

## Brightest Body

Brightest of them all—brightest body, in fact, in the night-time sky with the exception of the moon—is Jupiter, high in the south and just to the right of the "sickle," part of Leo, the lion, and of which the bright star Regulus is a component. The star is of magnitude 1.3, so it ranks as first, but the present magnitude of Jupiter is about minus 1.8, which means that the planet is 17 times as bright as the star.

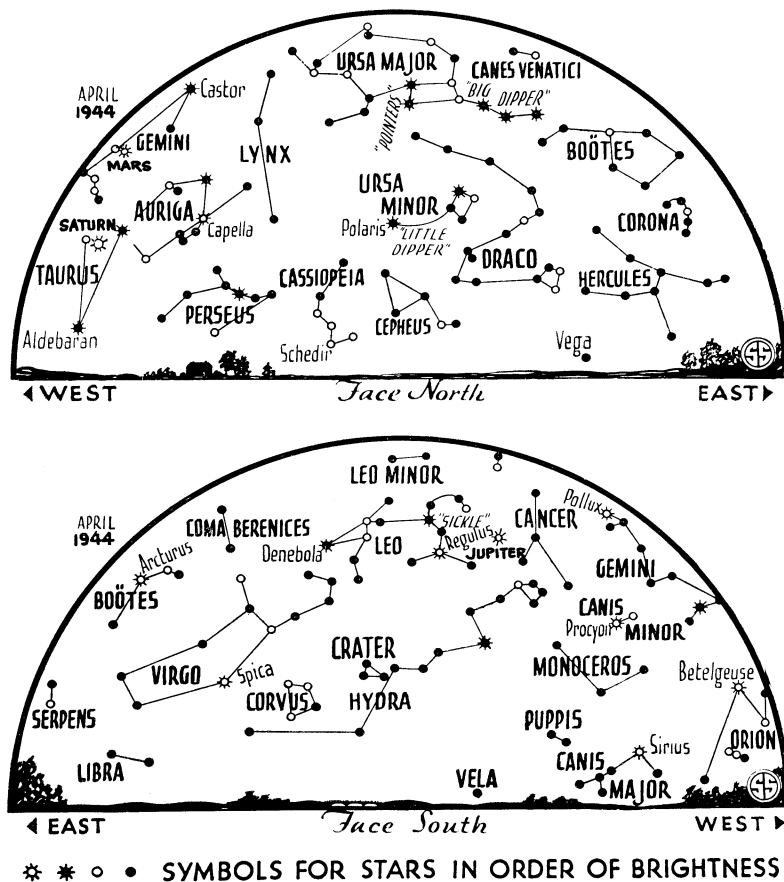
Saturn is shown to the west, in the

figure of Taurus, the bull, and just above the first magnitude star Aldebaran, which looks fainter because it is so low in the sky. Its magnitude is plus 0.3, so even it is some two and a half times the brightness of Regulus. It does not, however, equal Sirius, toward the southwest. The third planet is Mars, in Gemini, the twins, which is directly above Taurus. Mars is approximately the same brightness as Regulus (1.4) although it is rather difficult to compare the stars and planets in brilliance. The latter shine with a steady glow, while the former, mere points of light, often show the familiar effect of twinkling.

In addition to Sirius and Regulus there are several other stars of the first magnitude on view. The great winter-time constellation of Orion, the warrior,

is disappearing from view in the west, but Betelgeuse still remains in sight, above the three stars of Orion's belt. Vega, in Lyra, the lyre, is seen low in the northeast, and later at night, when it rises higher, shines more brightly. The big dipper, part of Ursa Major, the great bear, is high in the north, and while it contains no stars of magnitude one, it can be used to find two that have that distinction. Follow the curve of the dipper's handle to the east, and you come to Arcturus, in Bootes, and still farther along the same curve, you reach Spica, in Virgo, the virgin. Then also there is Procyon, in the lesser dog, Canis Minor, which is about halfway between Jupiter and Betelgeuse, toward the southwest. Above Canis Minor is Gemini, the twins, in which Mars appears, and of which the star Pollux is also first magnitude.

Although Mercury is the innermost of the planets (revolving at a mean distance of 36,000,000 miles from the sun, instead of the earth's 93,000,000)



there was a time when astronomers, or some of them at least, thought there was another still nearer. Some books on astronomy published in the 1860's and 70's record Vulcan, revolving around the sun once in about 18 days (Mercury goes around it in 88 days) at a distance of 13,000,000 miles. Such a planet would be much harder to see than Mercury, and would never get far enough away from the sun to be seen even in twilight. It would be observable only in two ways. One would be at a total eclipse, when the moon covered the sun and hid its glare, and the other would be at a time of transit, that is, when the planet went directly in front of the sun. Because of its proximity to the sun, such transits could be considerably more frequent than those of Mercury and Venus.

### Discovery of Neptune

The discovery of Neptune in 1845 had paved the way for this supposed discovery of Vulcan. Uranus had been discovered by Herschel in 1781, but it did not move quite the way that astronomers calculated it would. By 1845 two astronomers, J. C. Adams, in England, and U. J. J. Leverrier in France, had decided that the reason was the pull of another, and then unknown planet. They independently calculated where the new planet would be, and when astronomers looked they found it there—and named it Neptune.

Then Leverrier also investigated the movement of Mercury, found a discrepancy there, and announced in 1859 that either the mass of Venus was about 10% greater than had been supposed, or that there was another planet or planets, moving around the sun inside the orbit of Mercury.

### Observed Strange Object

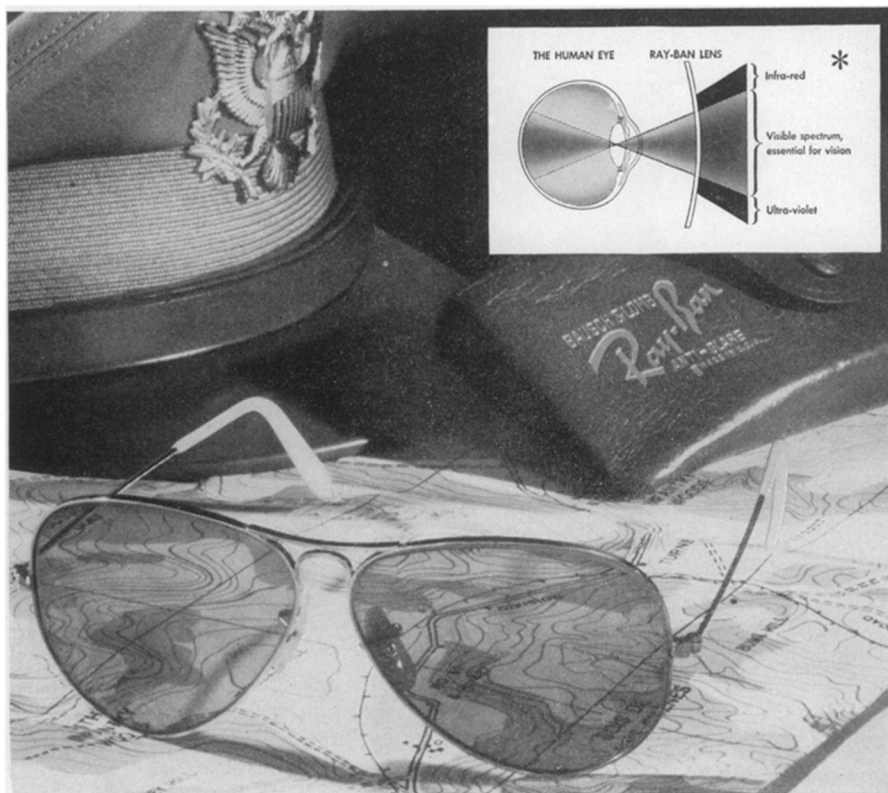
This announcement led a French physician, M. Lescarbault, to announce that on March 26, 1859, some months earlier, he had observed a strange object cross the face of the sun, that he thought it was a planet but had hesitated to announce it until he was sure. As a result, Leverrier went to see the doctor, very skeptical at first but came away satisfied that a new planet had been found.

When astronomers looked for it on later occasions, however, they could not locate it. For a number of years special photographs were made at solar eclipses to find such an object, but always in vain, until now we know that there is no such planet brighter than the

eighth magnitude, nor bigger than 30 miles in diameter. The discrepancy in the movement of Mercury has been explained on the basis of the relativity theory. So far it has not been definitely explained what Lescarbault, and others, too, actually watched when they supposed they were watching a planet. Some may have seen sunspots of a curious kind, though this would not explain all the observations. But deceived in some way they must have been.

But what about Mercury itself, which

is by no means imaginary? It is a large edition of the moon, and probably has a similar surface, although it cannot be seen well enough to tell whether there are craters like the lunar ones. It has no atmosphere, mainly because of its small mass. If you fired a bullet on Mercury at a speed of more than 2.3 miles per second it would leave the planet, never to return, as this would overcome its gravitational field. If it had an atmosphere, being so close to the sun, the molecules would move faster than this, and (*Turn to next page*)



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## Do You Know?

Oil was extracted from shale in Scotland as early as 1694.

The peel of *apples* is five times as rich in vitamin C as the flesh.

In 1942, a total of 2,808,996 *births* and 1,385,187 *deaths* were registered in the United States.

Applications for *air routes* from the United States to the other Americas have been filed by 25 companies.

*Battlescrap*, salvaged from battlefields and elsewhere, is becoming an important source of raw materials, particularly of metals.

Two species of *Sequoia* are all that remain today of some 45 species described from fossil beds in the Northern Hemisphere.

*Butter* is a mixture of milk fat, water, casein, salt, lactic acid, and coloring; federal standards call for at least 82.5% butter fat and not over 16% water.

"*WASPS*," civilian flyers of the Women's Airforce Service Pilots, have averaged 3,000,000 flying miles per fatal accident; they are now flying approximately 5,000,000 miles a month.

The fight against *tuberculosis* in the United States is making rapid progress; the mortality rate was cut in half during the first 20 years of the present century and halved again by 1940.

*Radio telephone* service is now open between the United States and Trinidad, the most southerly island of the West Indies; it is handled through short-wave telephone facilities at Miami, Fla.

*Carnauba wax* from Brazilian palms, formerly used in lipsticks, phonograph records, furniture polishes and for other purposes, is now used as a waterproofing and protective coating on war materials.

*Muskrats* are able to swing their lower jaws forward to sharpen the lower teeth against the upper, and the upper against the lower; the teeth are curved and grow continuously and must be kept worn away and sharpened.

## From Page 203

they, too, would leave forever. We on earth are more fortunate. The velocity of escape—the speed at which a bullet would have to be fired to leave our planet—is 7.5 miles per second, considerably higher than the average speed of our air molecules, so that is why our atmosphere stays with us.

Just as the moon always keeps the same half toward the earth, so Mercury always has the same hemisphere facing the sun. The result is that this part is hotter than any other planet, or about 770 degrees Fahrenheit, as measured by Drs. Edison Pettit and Seth B. Nicholson at the Mt. Wilson Observatory. Lead and tin both melt at this temperature. On the other hand, the dark side is exceedingly cold, close to the absolute zero of space, since there is no circulating atmosphere to warm it. And so Mercury has the unique distinction of having both the maximum and minimum temperatures among the planets.

As it did earlier this year, on Jan. 13, the moon will pass in front of Jupiter and "occult" it on April 30, but unfortunately it will take place between the hours, approximately, of 4:00 and 5:00 p. m., EWT, which is

during daylight. Thus, it will hardly be visible to the unaided eye (as it will be in Europe, where it occurs at night), but a small telescope will show the moon approaching the planet, and Jupiter's reappearance as the occultation ends. That evening, of course, the two bodies will still be close together. The moon will be about at first quarter. As it moves toward the east, the planet will be hidden by the dark edge. All over the United States and Canada the occultation will be observable, except that along the west coast the hiding of Jupiter will take place before the moon rises.

## Celestial Time Table for April

April	EWT	
3	9:39 a.m.	Moon passes Jupiter.
4	2:00 p.m.	Moon farthest: distance 252,000 miles.
8	1:22 p.m.	Full moon.
12	6:00 a.m.	Mercury farthest east of sun.
13	3:00 a.m.	Jupiter changes from westward to eastward motion.
16	1:59 a.m.	Moon in last quarter.
20	10:00 a.m.	Moon nearest: distance 225,900 miles.
21	early a.m.	Meteors of Lyrid shower visible.
	7:18 a.m.	Moon passes Venus.
22	4:43 p.m.	New moon.
26	8:24 a.m.	Moon passes Saturn.
28	4:33 a.m.	Moon passes Mars.
30	2:06 a.m.	Moon in first quarter.
	4:30 p.m.	Moon occults Jupiter.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, March 25, 1944

## METEOROLOGY

# Maps of World Climates

➤ SUPPOSE your regiment has been ordered to Timbuktu or Kamchatka or some other outlandish place you've hardly ever heard of. How can your supply officer be sure you and your buddies will be dressed and outfitted to be comfortable in the climate they will meet there?

A glance at the series of new monthly climatic maps of the world prepared by the Army Map Service will go far toward solving the problem. These maps show what kind of weather may be expected, on the average, each month in the year over all six of the world's continents. Each kind of climate is shown by a distinctive color, so all you need to do is find a matching color on the map of North America or other familiar region, and plan accordingly.

Thus, Timbuktu in June is colored up like western Texas in July. You'll find the same color around Darwin, in northern Australia, right now—it's still high summer in the southern hemisphere.

By matching colors on these new

maps, the supply officer will learn that Tokyo weather is virtually identical with that of Washington, D. C.; that the terrific Russian winters are about like normal winters in northern Minnesota, North Dakota or Maine; that the city of Duluth is climatically about on a par with Leningrad; and that Bismarck, N. Dak., has a climate similar to that of Moscow.

This newly developed monthly breakdown replaces the very general system of dividing the world into yearly regional climates. Presenting complete information on the rainfall, temperature and humidity, the maps are an invaluable aid in the determination of types of clothing and equipment for our fighting forces stationed at distant and heretofore relatively unknown and uncharted regions.

Looking into the future, Major W. F. Heald of the Climatological Unit of the Quartermaster Corps predicts a very practical peacetime use of these maps when pleasure travel is again in order.

Science News Letter, March 25, 1944