

ASTRONOMY

Mercury in Evening Sky

Mercury, Venus, Jupiter and Saturn are all visible at once at the end of March, but this will require very clear skies down to the horizon.

By JAMES STOKLEY

► IN THE FALL of 1939 we had the privilege of seeing all five naked-eye planets—Mercury, Venus, Mars, Jupiter and Saturn—lined up in a row in the western evening sky. Such a display will not come again for a long time, but at the end of March four of these planets, that is, all except Mars, will be in the sky at the same time. Mercury is the most rarely seen of all these five, since it never appears except low in the east just before sunrise or low in the west just after sunset. On March 26 it reaches the latter position, called “greatest eastern elongation.” Then it will be in the constellation of Pisces, the fishes, and will set nearly two hours after the sun. Thus, as the twilight is gathering around the 26th you may look to the west, and if you see a bright “star” it will be Mercury, for no other object in that direction is likely to be mistaken for it.

Since the accompanying maps are prepared for somewhat later in the evening—11:00 p. m. March 1, 10:00 p. m. on the 15th and 9:00 p. m., war time, on the 31st, Mercury is not indicated on them, for Pisces will have set. However, there are three other planets which are shown. There is Venus, brightest of all, at its greatest brilliance, toward which it has been brightening for many months. It is in the west in the constellation of Aries, the ram, and on March 10, when it attains maximum brightness, will be of magnitude minus 4.3 on the astronomical scale.

Saturn Is Next

Swinging toward the south the next planet we come to is Saturn, which is in Gemini, the twins, close to the stars that mark the foot of Castor, one of these boys. Its magnitude is 0.2, which makes it brighter than any star except Sirius, the dog star, which is below it.

Toward the east is Jupiter, in the figure of Leo, the lion, near the star marking the beast's hind foot. On March 13 Jupiter is at opposition which means that it is directly opposite the sun, so it rises as the sun sets. Therefore, when Mercury

makes its appearance around the 26th, it will be possible, though perhaps not easy, to see Jupiter before Mercury has disappeared, and this will put four naked eye planets into the sky at once. This will, however, require very clear skies down to the horizon both in the east and west, and that condition may be hard to find.

When Jupiter is in opposition, as in March, the earth is on the same side of the sun as the planet, so that we are closest, and that planet is brightest. Jupiter's magnitude is minus 2, brighter than any other except Venus. Its distance on the 13th is 412,200,000 miles.

Mars Is Not Visible

Mars, the remaining planet, is not visible these evenings. It is very close to the sun and rises a short time before sunrise. Because it is now far on the other side of the sun, it is very faint, and hard to see. But there is another planet in the evening sky, one that this month is also at opposition and at the greatest brightness; not enough, however, to make it visible to the naked eye. This is Neptune, which is in Virgo, below Jupiter. Opposition is on March 25 when the distance is 2,720,000,000 miles.

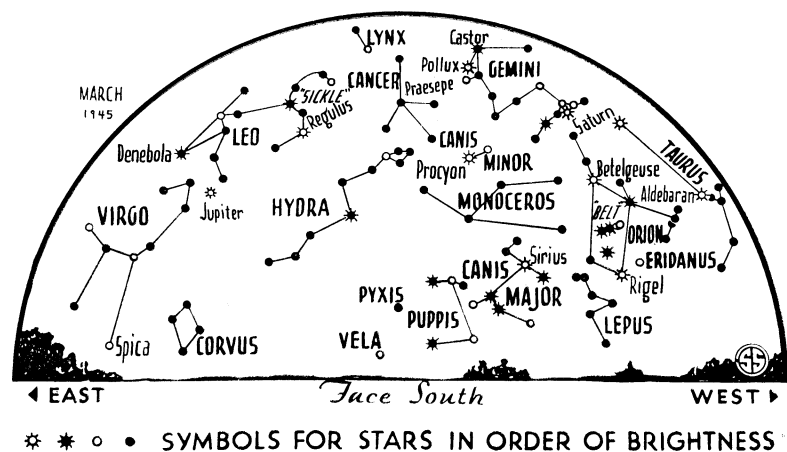
The chief stars to look for this month are those in the southwest in and around the constellation of Orion. In Orion itself are two first magnitude stars—Betelgeuse, above, and Rigel, below. Above Orion are Gemini, the twins, in

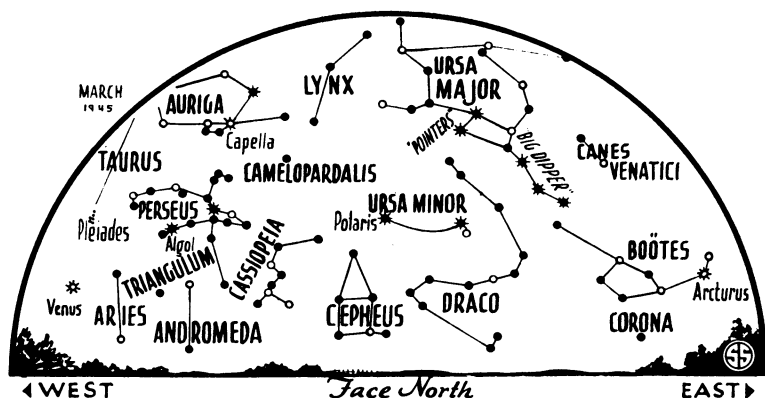
which Saturn stands, and with first magnitude Pollux. Below Pollux is Procyon, in Canis Minor, the lesser dog. Still nearer the horizon is the great dog, Canis Major, with Sirius. Taurus, the bull, is in the west, with brilliant Aldebaran. Next to Taurus is Auriga, the charioteer, with Capella, another of the first magnitude.

Coming up in the east are some other first magnitude stars. There is Regulus, in Leo, the lion. Below is Spica, in Virgo, the virgin, though this star is so low that it does not appear at full brilliance. A little farther north is Arcturus, in Bootes, the bear-driver.

Mercury, which makes its most favorable appearance of the year in March, is the closest of the planets to the sun. Instead of the 93,000,000 miles separating the sun from us, Mercury is only 36,000,000 miles from the center of the solar system, and thus it gets far more heat in the form of radiation from the sun. Its diameter is only 3,010 miles, and it turns on its axis once in 88 days, the time that it requires to revolve around the sun. That means that it always keeps practically the same hemisphere toward the sun, just as the moon does toward the earth. One half of Mercury, therefore, is probably very hot, with the temperature high enough to melt lead, while the opposite half, where the sun never shines, is very cold.

On Mercury there seems little possibility of any atmosphere which might ameliorate this condition to some extent. For every planet there is a speed, called the velocity of escape, at which an object can be projected to overcome completely the gravitational attraction. At





the surface of the earth it is about seven miles per second, but for Mercury, it is only 2.2 miles per second.

Now this speed applies to any object, whether it is as big as a house—or a rocket ship—or a single tiny molecule. Our atmosphere consists of molecules of nitrogen and oxygen, which are in constant movement, but the average velocity is considerably less than seven miles per second. Only occasionally will an air molecule at the top of the atmosphere move fast enough to leave the earth completely, and join the stray molecules moving around in space.

On Mercury, however, the speed of movement of such molecules would be greater, because of the higher temperature. Thus, if Mercury were by some miracle to be suddenly endowed with an

atmosphere like ours, it would soon lose it. In view of this, Mercury seems quite unsuitable as the possible abode of life.

Celestial Time Table for March

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|--------|------------|--|
| Mar. 2 | 3:00 a.m. | Moon farthest, 252,200 miles. |
| 7 | 12:30 a.m. | Moon in last quarter. |
| 10 | 4:00 a.m. | Venus greatest brilliance. |
| 13 | 8:00 a.m. | Jupiter nearest, distance 412,200,000 mi. |
| | 11:51 p.m. | New moon. |
| 14 | 5:00 p.m. | Moon nearest 222,300 miles. |
| 16 | 6:30 a.m. | Moon passes Venus. |
| 20 | 3:11 p.m. | Moon in first quarter. |
| | 7:38 p.m. | Spring commences. |
| | 10:54 p.m. | Moon passes Saturn. |
| 25 | 10: p.m. | Neptune nearest, distance 2,720,000,000 miles. |
| 26 | 5:00 a.m. | Mercury farthest east of sun. |
| 27 | 1:13 a.m. | Moon passes Jupiter. |
| 28 | 1:44 p.m. | Full moon. |
| 29 | 8:00 a.m. | Moon farthest, 252,600 miles. |

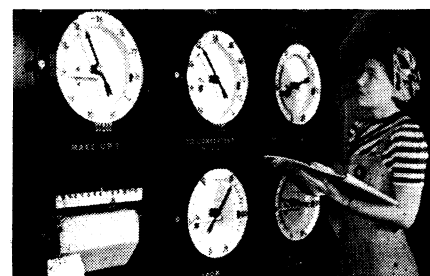
Subtract one hour for CWT, two hours for MWT, and three for PWT.
Science News Letter, February 24, 1945

states that the use of the walk-around oxygen equipment does not eliminate the need for wearing life vests.

The primary job of the walk-around oxygen equipment is to give airmen freedom to move about their bomber at high altitudes, without risking their lives through the removal of their oxygen masks. Pilots and air crewmen need oxygen at high altitudes because without it they have faulty judgment, poor coordination, and short memory.

Atmospheric pressure, which under normal conditions near sea level forces oxygen into the blood stream through the lungs, falls off at high altitudes so that less oxygen actually gets into the blood, unless an oxygen mask is used.

The walk-around oxygen unit consists of a low-pressure oxygen cylinder with a harness, and a regulator which dilutes oxygen with air whenever it is safe to do so, and supplies more oxygen on demand. The same mask that is used with a regular oxygen station can be used with the walk-around assembly. In addition to allowing airmen to move around the plane away from their oxygen stations, walk-around bottles can be used to retrieve a crew-mem- (Turn to Page 127)



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INVENTION-PHYSIOLOGY

Walk-Around Oxygen Unit

Helps save the lives of airmen by enabling them to breathe under water as well as by supplying oxygen at high altitudes.

► WALK-AROUND oxygen units help save the lives of airmen by enabling them to breathe under water while trying to escape from their downed bomber planes, as well as by supplying vitally-needed oxygen at the high altitudes at which modern bombers fly.

Many men, uninjured when their shot-up planes crashed into the sea, have lost their lives by drowning because they were unable to breathe under water while trying to escape through hatches and windows. The walk-around equipment enables them to breathe while finding a way out of the plane, bob up to the surface of the water, and float for a time as

though buoyed up by life vests.

The new equipment was developed by Capt. W. C. Kulesz, of the Aero Medical Laboratory at the Air Technical Service Command. Length of functional time depends upon water pressure as well as on the pressure in the oxygen bottle or cylinder. Approximate durations obtained during tests were six minutes at a depth of 10 feet, five minutes at 20 and 25 feet and 3.5 minutes at 50 feet.

Instructions to flyers in doomed bombers direct the men to don their portable oxygen equipment immediately after bracing themselves in ditching position for the impending impact. Capt. Kulesz