ASTRONOMY

Mars Shines in Evening

Mars is becoming quite brilliant in the evening sky as it approaches the date of closest "brush" with earth since 1924: 35,120,000 miles on Sept. 7.

By JAMES STOKLEY

➤ APPEARING low in the southeastern sky about two hours after the sun sets, at the beginning of August, the red planet Mars is a brilliant object during the later hours of the evening.

By the end of the month, it will rise soon after sunset and be visible the rest of the night.

The great brilliance of Mars, minus 2 on the astronomer's magnitude scale, is due to the fact that it is approaching close to the earth. At the beginning of August it is more than 43,200,000 miles away but, as the month ends, it will have drawn still closer to only 35,500,000 miles.

This seems a long distance, but is almost next door, astronomically speaking. On Sept. 7 Mars will be closest, at 35,120,000 miles, nearer than it has been since 1924.

Mars is in the constellation of Aquarius, the water-carrier, which appears in the southeastern evening sky in the position shown on the accompanying maps. These give the appearance of the heavens at about 10:00 p.m., your own kind of standard time, on Aug. 1; 9:00 p.m. on the 15th, and 8:00 p.m. as the month comes to a close. (Add one hour for daylight saving time.)

Saturn Also Visible

Another planet also is indicated. This is Saturn in the constellation of Libra, the scales, in the southwest. It is close to Scorpius, the scorpion, in which appears the first-magnitude star Antares. The star name means "rival of Mars," applied because of its ruddy color.

With Mars also in the sky it is easy to compare them. At present the planet is nearly 16 times as bright as the star.

However, Antares is not the brightest star visible these evenings. That distinction belongs to Vega, in Lyra, the lyre, which stands directly overhead at the times for which the maps are prepared. Vega is about twice as bright as Antares, although the ratio seems more than that, since Vega is so high, and its light suffers relatively little absorption by the earth's atmosphere.

Second star in brightness is Arcturus, in Bootes, the bear-driver, toward the west. Antares is third, then comes Deneb, in Cygnus, the swan, which is high in the northeast, just below Lyra.

High in the south is Aquila, the eagle, where we find Altair, fifth and last of the first-magnitude stars to be seen on August evenings.

Venus, the planet which was so brilliant in the western evening sky during the spring, has now swung to the eastern side of the sun, so it is now a morning star. It shines in the east, before sunrise, as brightly as it did in the evening a couple of months ago.

Although Mercury on Aug. 31 reaches its position farthest east of the sun, which sometimes brings it into view in the evening sky, this is not a favorable time for seeing it.

Jupiter, also, which has been conspicuous in the southwestern evening sky in recent months, has now drawn close to the sun, following it below the horizon so closely that it cannot be seen either.

Venus Comes Even Closer

Although the close approach of Mars this summer is causing astronomers in many parts of the world to turn their telescopes toward it, there is another planet that comes even closer. This is Venus, which was less than 27,000,000 miles away on June 22, although no one got excited about it. The reason is that when Venus is closest it is invisible, for it is between earth and sun. When Mars is nearest, the earth is between it and the sun, so we can view it during the night.

Mars is considerably smaller than the earth. The diameter of our planet is 7,918 miles, while that of Mars is about 4,200 miles.

Furthermore, the red planet is less dense than the earth. While our average density is about five and one-half times that of water, that of Mars is only about four on the same scale. These two factors—smaller size and lower density—give Mars a total mass only about a tenth of the earth's.

With smaller mass, the attraction of gravity on the Martian surface is only a little more than a third of what we experience.

That is, a man weighing 200 pounds on earth would weigh only 74 pounds there. Of course, this would have to be measured with a spring balance. One using weights would give the usual reading, because the weights themselves would weigh less.

A curious feature of Mars is its two little moons, which were discovered by an American astronomer, Dr. Asaph Hall of the U. S. Naval Observatory, when the planet made a close approach in 1877. Knowing his Iliad, he named them Phobos (panic) and Deimos (fear) after the mythological attendants of Mars, the god of war.

Estimate Satellite's Size

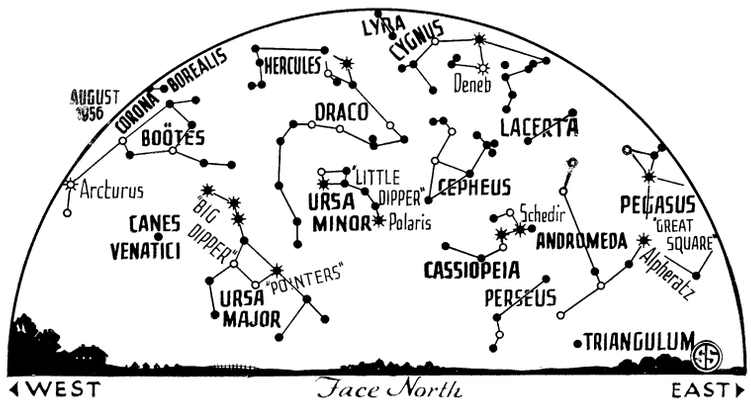
Phobos is larger, about ten miles in diameter, although this cannot be measured very precisely. Even through a large telescope it appears only as a point of light—there is no disc to measure. However, by measuring the amount of sunlight it reflects to us, and comparing that with the light from Mars, its size has been estimated.

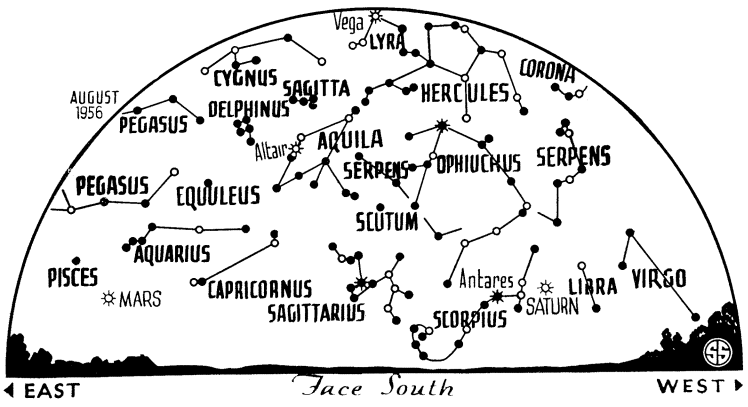
Another peculiarity is its closeness to the planet. Our moon, for example, is about 59 times as far from the earth's center as the surface on which we live. The radius of Mars, the distance from center to surface, is about 2,100 miles, while Phobos is less than twice that figure—about 3,730 miles—above the surface.

It revolves around Mars in 7 hours and 39 minutes, about three times as fast as Mars itself turns. It moves in an easterly direction, so to a Martian observer it would seem to rise in the west and set in the east, thus traveling the opposite direction from the stars and planets. On Mars these go from east to west each day, as they do on earth.

Deimos, which is about five miles in diameter, is farther out, about 14,600 miles from the center of the planet.

It rises in the east, but because its period of revolution is some 30 hours 18 minutes,





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

only about six hours more than Mars' rotation period of 24 hours 37 minutes, its easterly motion causes it to lag behind the stars and planets as they move westward during the night.

In fact, seen from one position on Mars, Deimos would rise only once in five and one-half days.

That is, if you were on Mars, you might see it come up this evening, but at sunrise tomorrow morning it would not yet have set. After dark tomorrow evening it would still be in the sky!

AERONAUTICS

Lifting System for Planes Passes Trials

➤ A CARRIER-BASED AIRPLANE that helps blow itself into the air has successfully passed its first trials.

The new system is called "flap-blowing." Its object is to give more lift power to the wings. If this can be accomplished, problems such as the limits of landing space, speed of a moving carrier, stopping power of arresting gear and the launching capabilities of catapults might be solved.

In "flap-blowing," a jet of air is blown out from the airplane's engine and directed along the wing's rear edge where the flap bends from the wing. Without the jet of air, turbulence starts behind this line, but with the jet air, lift is "significantly increased," because the air flows smoothly over the top surface of the flap.

The system was tested in 110 trials on a modified de Havilland Sea Venom Mark 21. It decreased stalling speed by 15 knots.

The power plant was a standard gas turbine, the Ghost 104, modified to give the required air supply at the wing-flap juncture. The engine was equipped with a governor to prevent overheating.

The aircraft's wings were fitted with dropped leading edges, which also increase lifting power.

"Flap-blowing" to get planes into the air in less space would not have to be restricted to carrier-based planes. It could also be used to get land-based aircraft off the ground from shorter runways. Added weight is still a problem that British engineers are now trying to overcome.

Science News Letter, July 28, 1956

Celestial Time Table for August

AUG.	EST	
3	7:40 a.m.	Moon passes Venus.
5	4:00 p.m.	Moon nearest, distance 222,400 miles.
12	early a.m.	Meteors of Perseid shower, which seem to radiate from constellation of Perseus, visible, especially after midnight.
13	3:45 a.m.	Moon in first quarter.
	4:05 p.m.	Moon passes Saturn.
18	11:00 a.m.	Moon farthest, distance 252,200 miles.
21	7:38 a.m.	Full moon.
23	4:05 p.m.	Moon passes Mars.
28	11:13 p.m.	Moon in last quarter.
30	12:00 midnight	Mercury farthest east of sun.
31	1:00 p.m.	Venus farthest west of sun.

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

Science News Letter, July 28, 1956

AERONAUTICS

Tanker Can Refuel Three Fighters At Once in Flight

See Front Cover

➤ BORROWING FROM nature, aircraft planners are now using a mother ship to suckle smaller aircraft in mid-air to keep them in trim and alive. Being able to refuel smaller craft in mid-air has become an all-important factor in our nation's air defense.

A flying filling station is shown in the official U. S. Navy photograph on the cover of this week's SCIENCE NEWS LETTER. The Convair Tradewinds R3Y tanker is simultaneously refueling three McDonnell Banshee F2H jet planes in flight.

Science News Letter, July 28, 1956

ENTOMOLOGY

Wasps Given Formal Names

➤ WASPS are being classified for the first time in a joint project sponsored by the University of Michigan and the Dow Chemical Company.

Two-thirds of the 7,500 species of *Ichneumonidae* in the United States have not been named, and only a few sting people.

Most of these parasitic wasps probably do more good than harm. They kill such destructive insects as gypsy moths, alfalfa weevils, spruce budworms, and a variety of fruit pests.

The wasps are being classified by Dr. Henry Townes of the University and Robert R. Dreisbach of Dow.

Science News Letter, July 28, 1956