

ASTRONOMY

# Mars Comes Close

## Brighter Than Any Other Object in the Sky Save Only Venus, This Ruddy Planet Shines All Through Evening

By JAMES STOKLEY

**B**RIGHTER and more prominent than they were a month ago are the four bright planets of our evening sky. These, with the bright stars now beginning to appear as heralds of the brilliant skies of winter, make October evenings particularly beautiful.

The first planet you will see is Venus, in the west, setting about two hours after the sun. This is the brightest of all stars or planets now seen—of magnitude minus 3.7 in the astronomer's scale. (Because the accompanying maps are drawn for 10 o'clock on the evening of Oct. 1 and 9 o'clock on the 15th, by which times Venus has set, they do not show this planet.) There is no difficulty in finding it, because of its splendor.

Just about the time that Venus is setting, Saturn is rising in the east. It is in the constellation of Taurus, the bull, and is indicated on the maps. Of magnitude zero, it is the faintest of our four planets, though it surpasses any star now visible.

Throughout the night we can see Mars, in Pisces, the fishes, second only to Venus in brightness, with magnitude minus 2.4. Directly opposite the sun on Oct. 10, it rises at sunset and sets at sunrise. During October (on the third) it is unusually close to earth, which makes it so bright.

About three hours after sunset, Jupiter appears, like Saturn, in the figure of Taurus, to the east. Its magnitude is minus 2.2, only slightly fainter than Mars. It is not shown on the maps.

### Distance Dims Stars

Though the stars, actually distant glowing suns, are really many times brighter than the planets, which shine by reflected sunlight, they are so far away that they appear considerably fainter. Vega, in Lyra, the lyre, is the brightest now on view, high in the west. Above it is Deneb, of Cygnus, the swan. To the left of Vega is Aquila, the eagle, with Altair.

Shining in the east, in Taurus, just below Saturn, is Aldebaran, while next to this group, to the left, is Auriga, the charioteer, in which Capella is found. And the last of the six first magnitude

stars shown on the maps is Fomalhaut, in Piscis Austrinus, low in the south.

At this time many astronomers are turning their telescopes on Mars, because of the neighborly visit it is making to our part of the solar system. On Oct. 3 it is closest, the distance 38,100,000 miles.

If this seems far, just remember that the nearest Mars can possibly come to the earth is 34,600,000 miles, so this is really very good. Also, when it is closer, as it was in fact, in 1937 and 1939, it is farther south in the sky.

That means that for people in the southern hemisphere it is beautifully seen, high in the sky, but for us, in the northern parts of the earth, it is quite low. Now it reaches a quite respectable altitude, and this, for northern observatories, counteracts the slightly greater distance.

### Lowell, Chief Center

Chief center of Martian study is the Lowell Observatory, in Flagstaff, Arizona. This was founded by Dr. Percival Lowell, a wealthy amateur astronomer who made great contributions to the science. He was particularly interested in the planets, in Mars especially, and after his death in 1916, his successors have carried on these studies. Earl C. Slipher, brother of Dr. V. M. Slipher, present director of the observatory, is the principal Martian observer.

Mention Mars and most people think of canals. It was in 1877, when Mars made another close approach, that the Italian astronomer, Giovanni Schiaparelli, discovered on its surface some pe-

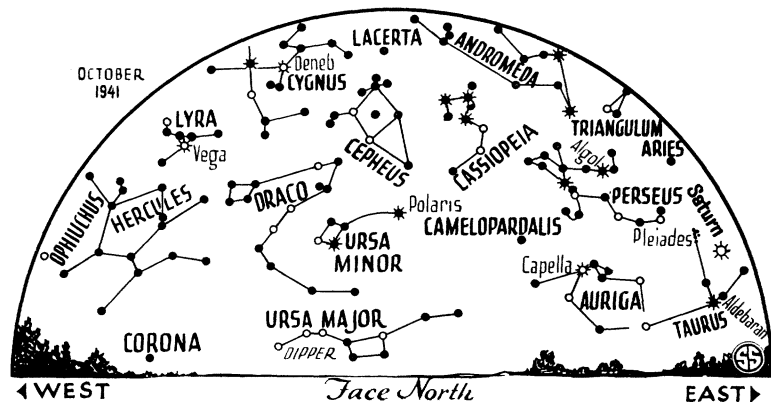
culiar straight lines that he called "canali." The word should really be translated into English as "channels," but somebody rendered it as "canals" and this name has been applied to them ever since.

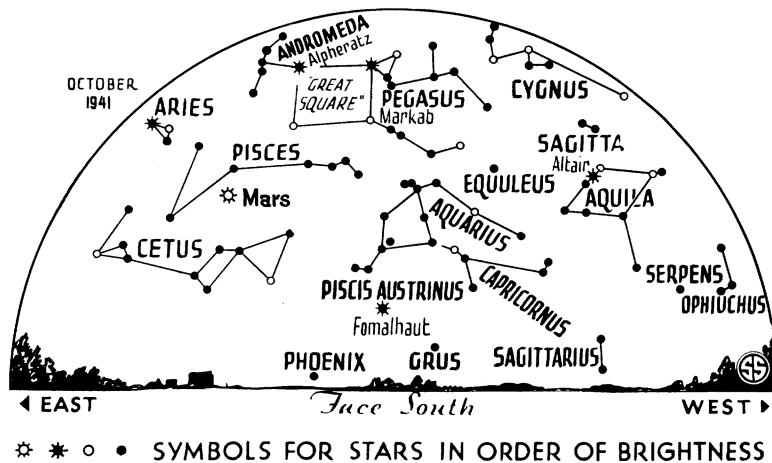
Since this word suggests an artificial waterway, in contrast to a natural "channel," it helped popularize the idea of inhabitants of Mars. However, this theory had good scientific backing for Prof. Lowell himself held to it. He thought that the network of lines, going so straight across the surface of the planet, could only have been placed there by some intelligent beings. He then concluded that they really were canals, used to augment a Martian scarcity of water by carrying the liquid from the melting snows at the poles.

Though they do not have any very good explanation for the "canals," very few astronomers today hold to the Lowell theory. In any event, the possibility of life on Mars seems ruled out by the apparent lack of essential oxygen in its atmosphere. At the Mt. Wilson Observatory, comparisons have been made between the light from Mars and that of the sun. When sunlight passes through the earth's atmosphere, certain colors are removed by the oxygen, producing dark lines when the light is analyzed into a spectrum band of color.

### No Oxygen Revealed

The sunlight which falls on Mars and is reflected to make the planet visible to us, also shows these lines, because it too has to pass through our atmosphere. But it also passes through the Martian atmosphere twice—on its way to the surface and on its way out again. Thus,





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## Second Neujmin Comet Proves To Be Old One

A SECOND COMET announced by the Soviet astronomer, Neujmin, a little more than a month after his independent discovery of the du Toit-Neujmin comet (See SNL, Sept. 20), proves to be an old one, the Schwassmann-Wachmann (1), 1925II, which was picked up on Harvard plates in South Africa in August. The identification was made by Mr. L. E. Cunningham of Harvard College Observatory.

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if there were oxygen above Mars, the effect would be enhanced in the spectrum of light from that planet.

As nearly as we can tell, however, the lines are exactly the same. It is estimated that if Mars had an atmosphere with one-thousandth the amount of oxygen that we have, some difference could be detected.

Now that Mars is close once more, these and other matters are again being studied. After the planet draws away from its visit, we may know a little bit more about some of its secrets.

### Celestial Time Table for October

**Friday, Oct. 3,** Mercury farthest east of sun, sets about  $\frac{3}{4}$  hour after sunset; 2:00 a.m. Mars nearest earth, distance 38,130,000 miles. **Sunday, Oct. 5,** 3:32 a.m., Full moon; 5:34 p.m., Moon passes Mars. **Wednesday, Oct. 8,** 10:53 p.m., Moon passes Saturn. **Thursday, Oct. 9,** 1:00 a.m., Moon farthest; distance 252,100 miles. **Friday, Oct. 10,** 3:00 a.m., Jupiter stationary, then starts apparent westward movement among stars; 8:00 a.m., Mars opposite to sun; 11:09 p.m., Moon passes Jupiter. **Monday, Oct. 13,** 7:52 a.m., Moon in last quarter. **Monday, Oct. 20,** 9:20 a.m., New moon. **Tuesday, Oct. 21,** 9:00 a.m., Moon nearest, distance 222,900 miles. **Wednesday, Oct. 22,** Early morning, Meteors seen of shower which seems to radiate from constellation of Orion. **Thursday, Oct. 23,** 12:13 p.m., Moon passes Venus. **Monday, Oct. 27,** 12:04 a.m., Moon in first quarter.

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## ● RADIO

**Thursday, October 2, 3:45 p.m., EST**

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. William H. Martin, director of the New Jersey Agricultural Experiment Station, will describe vitamin research studies with pigs.

Listen in each Thursday.

**Monday, October 6, 9:30 p.m., EST**

Science Clubs of America program over WRUL, Boston, on 6.03 and 11.73 megacycles.

First in a series of regular periods over this short wave station to serve science clubs, particularly in high schools, throughout the Americas. Dr. Harlow Shapley, Chairman of Science Service executive committee, director of Harvard College Observatory, will speak. Have your science group listen in at this time.

## PHYSICS

# Squeaks of Dry Ice Pick Out Precious Stones from Fakes

## Carbon Dioxide, Changing From Solid to Gas Causes Heat Conducting Substances To Vibrate; Glass Will Not

DIAMONDS and pearls can be distinguished from the counterfeits by touching them with a piece of dry ice. The real article emits a squeak or rattle; imitations do not. Quartz can be distinguished from common glass, and in general semi-conductors of heat from non-conductors.

These and other useful applications of the squeak caused by solid carbon dioxide or dry ice were pointed out by Miss Mary D. Waller of the London School of Medicine for Women in the British journal *Nature*. (Aug. 16.)

The mechanism of the squeak, she explains, is this: Solid carbon dioxide when heated passes directly from the solid to the gaseous state, skipping the liquid state. This property, shared by a number of other substances, like iodine, sulphur, carbon, is called sublimation. When a pointed piece of the dry ice is presented to a conductor of heat such as a metal plate, heat is conducted by the plate to the ice and turns some of the latter to gas. A powerful stream of gas issues from the point, as from a nozzle, and pushes away part of the plate immediately in front of it. As soon as this happens, the passage of heat to the dry ice stops, the gas stream stops, and the plate by virtue of its elasticity returns to contact. The whole thing is repeated over and over from 1000 to 4000 times a second. The plate is thus set into vi-

bration emitting high pitched notes from two to four octaves above middle C.

If a piece of glass or other non-conductor of heat is touched with the dry ice, no sound is emitted.

By careful manipulation, the usual squeak can be converted into a very pure musical note. This can be accomplished by lightly touching a high-pitched tuning fork with a well-pointed piece of the dry ice. Much depends on the skill of the operator in sensing the onset of the vibrations and then maintaining just the proper touch to sustain them. Similarly, metal plates may be made to vibrate and emit their overtones, thus producing the well-known Chladni figures. These are beautifully regular geometric figures, some of which have been used for decorative designs. Want of uniformity or flaws in plates may be discovered by distortions in the normal figures.

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In the frequently bombed port of Hamburg, German *camouflage* experts tried to confuse British fliers by covering a lake near the railroad with dummy buildings on floating rafts.

Describing one of America's most popular *wild ducks*, a government biologist says: "When hunted persistently, the mallard becomes extremely wary and develops nocturnal habits."