

ASTRONOMY

# Two Planets Join Summer Stars

## Mars and Jupiter Shine in Southern Skies; Occultation of Mars Occurs on July 17

By JAMES STOKLEY

**T**O THE STARS that shine in the summer, two planets now add their luster. Both are in the southern sky. In the southeast is brilliant Jupiter, in the constellation of Sagittarius, the archer, in which ten stars form a very good outline of a teapot, the spout to the right, the handle to the left. Jupiter is just east of the handle, and its great brilliance makes it easy to find.

Next to Sagittarius, to the right, is Scorpius, the scorpion. The tail curls around, under the spout of the teapot. A prominent red star, Antares, forms the heart, and a curved row of stars near it the claws. Still farther right is Libra, the scales. This is the present location of Mars, also red, but much brighter than Antares, the name of which, incidentally, means "rival of Mars."

### Use the Dipper

A good way to find the other bright stars in the evening sky is to start with the Great Dipper, in the north. This familiar figure, part of Ursa Major, the great bear, is shown on the accompanying maps, which depict the skies as they appear at 10:00 p. m., standard time, at the beginning of the month, 9:00 p. m. in the middle, and 8:00 p. m. at the end. It will be seen that the dipper is hanging on its handle, in the northwestern sky.

The stars at the bottom, called Dubhe and Merak, are the pointers, indicating the direction of the Pole Star. By following the curve of the handle, toward the south, one soon comes to Arcturus, in Bootes, the bear driver. Still farther south, along the same curve, is Spica, in Virgo, the virgin. This group is next to Libra.

The brightest star of the summer evening skies, though it is inferior to Jupiter and Mars, is Vega, part of Lyra, the lyre, seen quite high in the east. Below it is the figure of Cygnus, the swan, otherwise known as the northern cross. The cross is on its side, and first magnitude Deneb is toward the north. Below Cygnus is Aquila, the eagle, containing the star Altair.

Last month the most interesting as-

tronomical event was the total eclipse of the sun which was not, unfortunately, visible in the United States. Again during July we just miss seeing a phenomenon which, while not as important as a total eclipse, would be most fascinating to watch. This is an "eclipse" of the planet Mars.

### Moon Passes Planet

On July 17 the moon will pass directly in front of the planet, producing what is technically referred to, not as an eclipse, but as an occultation. It will be visible from an area covering most of the north Atlantic Ocean and western Europe and Africa, as well as Labrador and Newfoundland. The moon will then be in a gibbous phase, about two days past the first quarter. Since it moves through the sky from west to east, it will be the dark, eastern edge which will first cover the planet, so a person watching it would find the planet vanishing most mysteriously.

As much as two hours later, at some locations, it will reappear, now from behind the moon's sunlit edge. By the time the moon is high enough to see, even in the eastern part of the United States, the occultation will be over. It will then still be daylight anyhow, and Mars will not be visible, but after dark that evening Americans will be able to

### Phases of the Moon

		E. S. T.	
Last Quarter	.....July 1	8:03 a. m.	
New Moon	..... 7	11:12 p. m.	
First Quarter	..... 15	4:36 a. m.	
Full Moon	..... 23	7:46 a. m.	

notice how close Mars is to the moon.

A few days later, on the 22d, at 3:59 p. m., eastern standard time, the moon will pass Jupiter, but well to the north. On that evening, the full moon, with the brilliant planet near it, will again form an interesting spectacle in the southern sky.

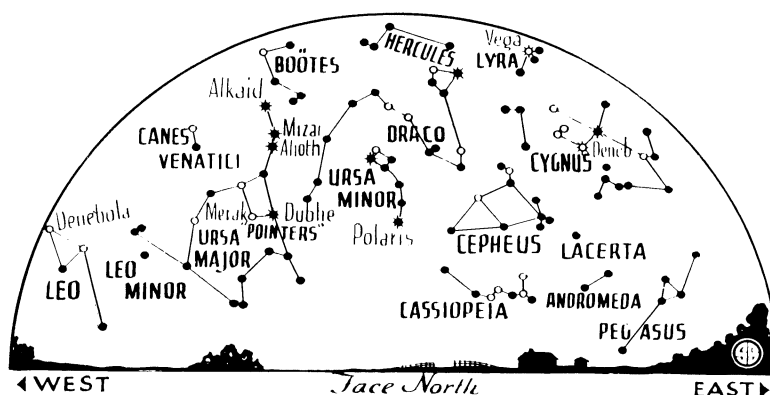
On July 4, at about 10:00 p. m., eastern standard time, the distance from the center of the earth to the center of the sun will be 94,454,200 miles. On New Year's Day we were closest, or at perihelion, with the distance only 91,337,700 miles.

### January Heat

This brings out a curious paradox. Naturally, with the sun the sole source of the light and heat of the earth, one would think that we would be warmest when we are closest, and that January should accordingly be our hottest month, with July the coldest. In fact, the earth, as a whole, does get more heat from the sun in January than in July, but there are other factors which counteract this, as far as the northern hemisphere is concerned.

In winter the sun is far to the south,

☉ \* ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



BETWEEN LYRE AND CROWN

*Hercules, near the peak of the heavens, followed by the Swan.*

it rises well south of the east point and sets well south of the west point. For us it is above the horizon much less than half of the twenty-four hours. Even at noon it does not rise very high. But in the summer, conditions are just the opposite. The sun rises in the northeast, sets in the northwest, is above the horizon for considerably more than half the day, and climbs to a great height at noon. Because it is in the sky so long, it has much more time to heat the earth. But even more important is the greater height. Its rays, on this account, fall on the ground almost vertically, and are thus more concentrated than when it is low.

*Science News Letter, June 26, 1937*

#### MEDICINE

### Medical Association Ends Birth Control Opposition

THE American Medical Association, after years of refusing officially to countenance birth control, adopted a committee report recommending investigation of methods and materials for contraception and the teaching of birth control procedure in medical schools.

All contraceptive advice, it was recommended, should be given at legally licensed clinics under medical control.

This seems to be in the nature of a triumph for the supporters of birth control movement. It means that physicians need no longer hesitate to give such advice to their patients when in their opinion bearing children would threaten the life or health of the mother or her children.

Only restriction on physicians now in this matter is such as may be imposed by the laws of their particular state.

*Science News Letter, June 26, 1937*

Insects living in dark cave recesses in Lehman Caves National Monument, Nevada, apparently are insensible to light but are highly sensitive to vibrations.

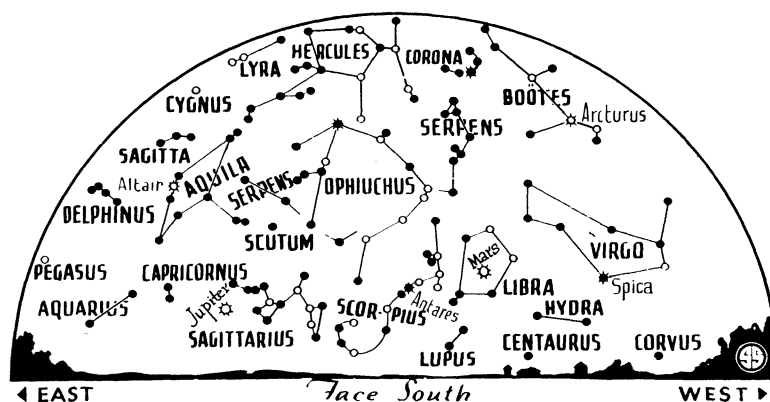
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#### RED PLANET, RED STAR

*Antares is not Mars' equal in brilliance and ruddy color.*

#### PHYSICS

## "Pencil and Paper" Team Set Pace For Cosmic Ray Research

THE mathematical genius of two University of California scientists is now guiding much of the cosmic ray research throughout the world. The "paper and pencil" team of Prof. J. F. Carlson and Prof. J. R. Oppenheimer has developed a new brain child in a theory of how the piercing cosmic rays are absorbed when they hit the upper atmosphere and eventually find their way into the recording instruments of the earth-bound investigators.

A majority of the cosmic ray researches reported at the recent meeting of the American Physical Society in Washington, for example, listed the work of Profs. Carlson and Oppenheimer as references.

The passage of a cosmic ray through the earth's atmosphere is like the return to earth of a 4th-of-July star-burst, according to the picture which physicists now have in mind. The path of the original ray branches out again and again into an ever-increasing number of new rays, called secondaries.

The task of Drs. Carlson and Oppenheimer was to calculate how often this branching-out takes place, how many times it can occur before the energy of the original ray (like the gunpowder in the 4th-of-July bomb) is all used up. Physicists want to know this in order that their observations near the earth's surface may tell them how many rays are coming into the atmosphere from outside.

The branching-out occurs when the cosmic ray particle comes very close to the nucleus of an atom in the air, according to the process which these physicists have calculated. In the intense electric field of the nucleus the cosmic ray particle (electron) generates a powerful kind of X-ray (photon) which in turn, when it comes close to another nucleus, is transformed back into a pair of electrons, charged positive and negative, respectively. The process repeats itself until the energy of the original ray is exhausted.

Another but less frequent kind of branching which Drs. Carlson and Oppenheimer mention in their paper involves the actual destruction of the atom with whose nucleus the cosmic ray collides. This results in a spray of atomic debris and is of the same nature as the transmutations which physicists accomplish with their high voltage atom-splitting machines and cyclotrons.

A current point of discussion among physicists is whether calculations like those made by the California physicists are valid for the tremendously high cosmic ray energies. The question might be, "Do the high-speed electrons from outer space obey the same laws as the electrons in radio tubes?" The tide seems to be turning in favor of the answer "Yes," according to recent reports.

*Science News Letter, June 26, 1937*