

ASTRONOMY

# Mars, Saturn Still Visible

**Brightest of stars to be seen during July is Vega, high in the eastern sky. Twenty-one stars in 88 constellations are rated of the first magnitude.**

By JAMES STOKLEY

► FROM ITS close approach to the earth in early May, when it was less than 52,000,000 miles away, by the middle of July the planet Mars will have receded to about 77,000,000 miles.

Even though it is gradually dimming as its distance increases, Mars still shines brightly in the southwestern evening sky. Its position is shown on the accompanying maps, which indicate the appearance of the heavens at about 10:00 p.m. on July 1, and an hour earlier around the 15th (add one hour if you are on daylight time).

Mars is near the border between the constellations of Libra, the scales, and Virgo, the virgin, and its red color along with its brightness makes it easy to locate.

Also in Virgo, a little to the west, is the other planet visible these evenings, Saturn. Its brightness is less than a third that of Mars, though it still equals a typical first-magnitude star. At mid-July its distance will be some 755,000,000 miles, nearly ten times as far as Mars.

## Spot Brightest Vega

Brightest of the stars to be seen these evenings is Vega, in Lyra, the lyre, high in the eastern sky. Underneath it is the figure of Cygnus, the swan, with Deneb as the most brilliant star.

In Cygnus is the group known as the northern cross, which is now horizontal, with Deneb at the northern end. This is divided between the maps for the northern and southern halves of the sky.

Just under the star marking the southern end of the cross is another bird, Aquila, the eagle, and in it shines Altair. This star is third in brightness among those shown.

The second brightest is high in the west, Arcturus, in Bootes, the bear driver. One good way of locating it is to look for the familiar "great dipper" in the northwest.

As nearly everyone knows, the two stars Dubhe and Merak, in the bowl of the dipper, which is now at the bottom, are the pointers which show the direction (now toward the right) of Polaris, the pole star.

The dipper may also be used to find Arcturus. All one has to do is to follow the curve of the handle and Arcturus is the first bright star.

Continuing the curve still farther toward the south brings you to Virgo. Besides Mars and Saturn, which are temporary

visitors to it, this group has the star Spica as a permanent resident.

Directly south, just above the horizon, stands Scorpius, the scorpion. The brightest star is Antares, the name of which means "rival of Mars," given because of its red color. With the planet also visible a short distance to the right, it is now easy to compare them to see whether the ancients were justified when they named Antares.

## Jupiter Brighter Than Mars

After midnight, the planet Jupiter rises in the east in the constellation of Aries, the ram. Its magnitude about July 15 is minus 1.9, which makes it nearly five times as bright as Mars.

On July 15 the innermost planet, Mercury, is farthest east of the sun and will remain in the sky a little while after sunset. Though this is not the time of the year for it to be seen best, one may be able to get a glimpse of Mercury as twilight is falling. A clear view to the west is essential to find this planet.

Venus, which passed behind the sun late in June, is also in the evening sky just after sunset, but has not yet drawn far enough away from the sun to be seen. By August, however, one should be able to glimpse it.

It would be interesting to watch the evening sky carefully around the end of July and early August to see when Venus may first be discerned.

For quite obvious reasons the constellations containing the brightest stars get most attention. Yet there are 88 constellations and only 21 stars of the first magnitude. Since three constellations (Orion, the south-

ern cross and the centaur) contain two each, that means only 18 constellations can boast of a star of this brightness. Among the remaining 70 there are many important groups and even the least conspicuous have many points of interest.

For example, on the southern map, to the right of the lower part of Aquila, is a single star marked Scutum. In this group there are some 28 stars as bright as the sixth magnitude, which is generally considered the faintest that can be seen with the naked eye under the very best conditions. The brightest of these, of the fourth magnitude, is the only one of sufficient brilliance to be indicated on these maps.

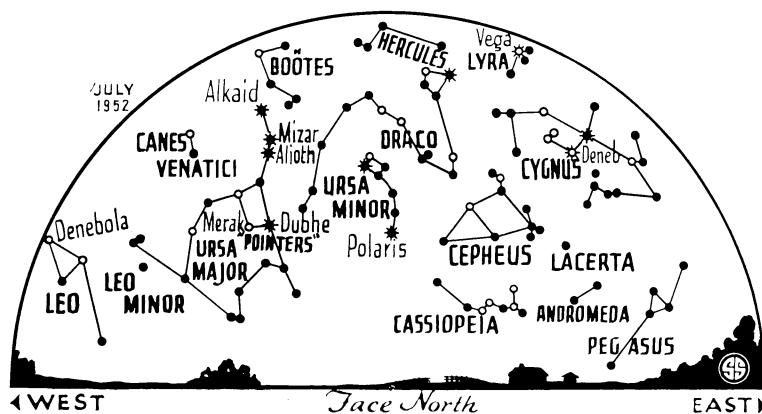
The constellation of Scutum is one of a number that were introduced by the Polish astronomer Hevelius in his maps of the skies published in 1690. He called it Scutum Sobiescianum, or Sobieski's shield, and with it he paid honor to the king of Poland, John Sobieski.

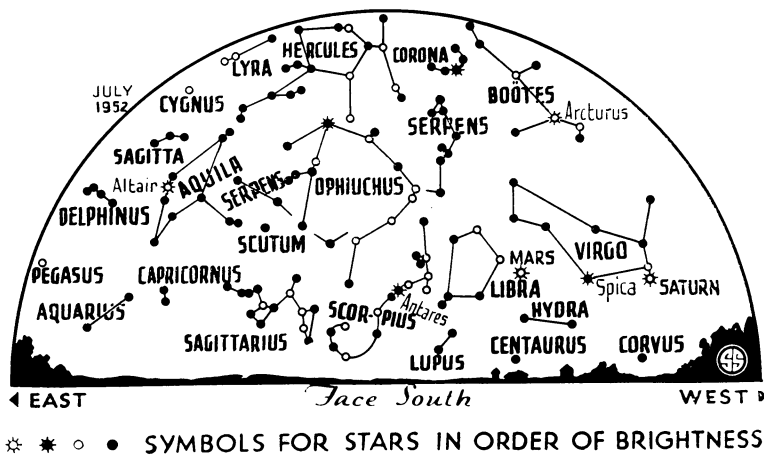
This great hero, commander of the Polish army, fought against the Turks and after defeating them at the battle of Hohn was elected king in 1674. He defeated them again in 1683 as they were besieging Vienna, and this brought him his greatest fame. This, added to the fact that he was a patron of science and literature, makes it readily understandable why Hevelius placed his coat of arms in the sky, on his shield.

## Scutum in Milky Way

Astronomically, Scutum, as it is now generally called, is in the brightest part of the Milky Way, which consists of vast swarms of stars. Many years ago Sir William Herschel estimated that within the boundaries of this little group as many as 331,000 stars could be detected. With modern instruments the number that could be spotted would be even greater.

Then there is Corona Borealis, the northern crown, which is shown high in the





west, just above Boötes. This has a star of the second magnitude, as well as four of the fourth, so five are indicated. Thirty-four are shown on a map that goes down to the sixth magnitude.

The arrangement of the brighter stars makes readily apparent why the ancients termed this first a wreath and later, a crown. Mythologically this was identified with the crown that Bacchus presented to Ariadne, daughter of Minos, second king of Crete.

**Legend of the Crown**

According to the legend, Theseus, King of Athens about 1200 B.C., was shut up in the famous labyrinth at Crete, where dwelt the ferocious Minotaur. It was this animal's habit to feed on the young men and women that the Athenians furnished each year as a tribute.

Theseus killed the Minotaur and, with the aid of a thread that Ariadne had furnished him, was able to find his way out of the labyrinth. He married Ariadne and took her away to the island of Naxos, though later he ungratefully deserted her!

According to Plutarch, she lived for many years after this and was loved by Bacchus, who gave her a crown of seven stars. After her death, this was placed in the sky.

To some tribes of American Indians, this group was a council of chiefs around a campfire. In the center of the circle there is a faint star, and they said that this was a servant, standing over the fire, and cooking the meal.

**Zodiac Constellation**

Though it is one of the 12 constellations of the zodiac through which the sun, moon and planets appear to move, and can hardly be called a constellation that is not well-known, the group of Libra, the scales, contains no stars brighter than third magnitude. It stands in the southwest between Virgo and Scorpius, and Mars is within its boundaries for the early part of the month.

Originally, Libra was part of the scorpion and represented that creature's claws. In fact, the two brightest stars in Libra have names that recall this connection. The one to the north is called Zubeneshamali and the other Zubenelgenubi. These mean, respectively, "the northern claw" and "the southern claw," which hardly makes sense in a pair of scales.

Perhaps the change came in the time of Julius Caesar, for the Romans are said to have placed him in the sky, holding a pair of scales. Later, according to this theory, the figure of Caesar was dropped and only the scales remained.

However, there is evidence that much earlier these stars were also considered as a pair of scales, so perhaps the Romans merely revived an older concept.

**Celestial Timetable for July**

July	EST	
2	10:32 a. m.	Moon passes Mars
	9:00 p. m.	Earth farthest from sun, distance 94,451,000 miles
7	7:33 a. m.	Full moon
8	6:00 a. m.	Moon nearest, distance 222,800 miles
13	10:42 p. m.	Moon in last quarter
15	4:00 p. m.	Mercury farthest east of sun
	11:19 p. m.	Moon passes Jupiter
21	6:30 p. m.	New moon
22	11:26 a. m.	Moon passes Venus
23	3:00 a. m.	Moon farthest, distance 252,500 miles
	11:28 p. m.	Moon passes Mercury
27	11:03 p. m.	Moon passes Saturn
28	early a. m.	Meteors visible radiating from constellation Aquarius
29	8:51 p. m.	Moon in first quarter
30	1:32 p. m.	Moon passes Mars

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

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The octopus may change color when startled, frightened or otherwise emotionally aroused.

To save paint on indoor wood, seal the wood surface with a thin coat of fresh, white shellac and allow to dry before painting.

**BIOCHEMISTRY**

**Chemical Supplies Cancers With More Blood and Food**

➤ A CHEMICAL from cancers that brings increased blood and nourishment to the malignant growth has been discovered by Dr. Kenneth G. Scott and associates at the University of California, San Francisco.

The chemical was extracted from cancers. Its chemical nature is still not completely known, but it is part of a protein molecule and resembles the adrenal gland hormone, adrenalin, or epinephrine.

Blood vessels supplying tumors are enlarged by this chemical and the clotting time of the blood is increased from four minutes to more than half an hour. Both these changes make it possible for growing tumors, or cancers, to rob normal tissues of nourishment from the blood.

In normal animals, Dr. Scott and associates found, blood makes up 5.4% of the body weight. In cancerous animals it makes up 7.1%.

Dr. Scott is now trying to identify the cancer chemical that gives the cancer more than its share of food. If this identification can be made, a way of destroying the chemical faster than the cancer can produce it might prove effective in checking the growth of cancers.

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**ENGINEERING**

**Radioactive Cutting Tools Aid Research Engineers**

➤ RADIOACTIVE CUTTING tools used in research machine shops are giving design engineers clues to the wearing qualities of the tools, and to the effectiveness of different cutting fluids, work materials and cutting conditions.

This was reported to the American Society of Mechanical Engineers meeting in Cincinnati by E. J. Krabacher, research engineer, M. E. Merchant, assistant director of research, and Hans Ernst, director of research, of the Cincinnati Milling Machine Co. They said that the application of radioisotopes to tool testing seems to hold promise for speeding up and simplifying the process of obtaining such machine-shop data.

The method permits many more measurements to be taken in a given time and at less cost and with much less material.

Basically the testing process works like this: Cutting tools are irradiated in a nuclear reactor by neutrons. The tools then are used on metal-working machines to cut metal. A Geiger counter measures the radioactivity of the chips from the workpiece. The amount of the measured radioactivity is a direct measure of the rate of tool wear.

Since the rate of wear is essentially constant throughout the tool's life, a short test can yield a reasonable estimate of the tool's entire life.

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