ASTRONOMY

Bright Star Sextette

But Only One Planet Is Left in July Evening Sky And That Is Very Inconspicuous, Low in Northwest

By JAMES STOKLEY

SIX BRIGHT stars, of the astronomer's first magnitude, decorate the evening skies of July, and are shown on the accompanying maps. These depict the heavens at 11:00 p. m., war time, on July 1, and an hour earlier on the 15th. The stars would be arranged the same way an hour earlier still—that is at 9:00 p. m. on July 30, but then the sky will hardly be dark enough to see them.

Vega, in Lyra, the lyre, is the most brilliant of the July sextette. It is high in the east and, with nothing else so brilliant, especially in that vicinity, it is easy to locate. Second brightest star is Arcturus, in Bootes, the bear driver, to the southwest. This can be located by following southward the curved line of the handle of the Great Dipper, which is in the northwest.

Altair in Aquila, the eagle, ranks third in brightness, and can be located in the southeast, made easy to identify because of the two fainter stars which attend it, one just above, the other below. Fourth in order of brightness, is Spica, in Virgo, the virgin, to the southwest. The same curved line from the dipper's handle, that led us to Arcturus, takes us to Spica when continued farther.

The star in place number five is very easy to find, and it is one that seems symbolic of the evening skies of summer. This is Antares in Scorpius, the scorpion, low in the south. Distinctly red in color, Antares can be recognized without difficulty. Also, it is part of a very striking group of stars, ending in a hook-shaped figure that forms the scorpion's tail. This is one of the few constellations in which there is actually some resemblance between the star arrangement and the thing they are supposed to represent.

Cross Now on Side

Number six is Deneb, in Cygnus, the swan, another familiar group that is sometimes called the northern cross, and is seen in the northeast. Since the cross is now on its side, however, it is not quite as easily recognized as it will be next autumn when the cross stands majestically vertical in the west. In the figure of the bird Deneb is the tail and the crossarms are its outstretched wings in flight.

Only one planet is left in the July evening sky, and that is very inconspicuous. Mars now receding to the most distant parts of its orbit, far beyond the sun, is of the second magnitude, and visible, if you can find it, low in the northwest. However, around July 6, Mercury will be seen in the east before sunrise, and also, even brighter, will Venus be seen, low in the east as morning twilight breaks. Saturn, though fainter, is also a morning star and Jupiter will become one at the end of the month.

Sun Farthest Away

During July, when the noonday sun is so hot, it seems much closer to us than it did last January. But actually, this is the time of year when the earth is in "aphelion," that is, farthest away from the sun. "Perihelion," the time when it was nearest the sun, came in January. Then, on the second, sun and earth were only 91,341,000 miles apart, while July 6 finds them separated by 94,421,000 miles.

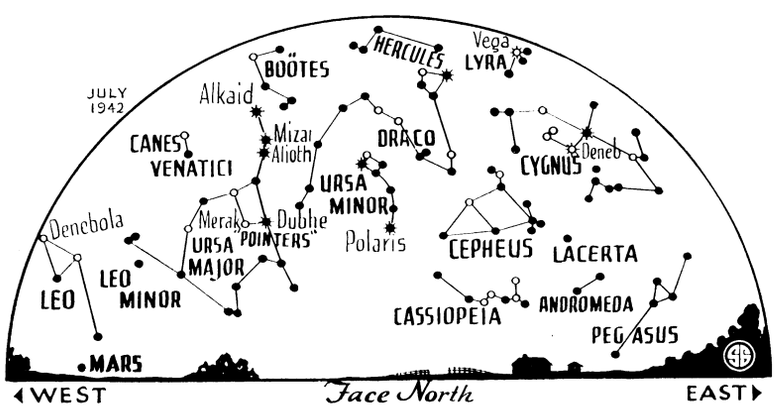
It might seem that this added distance, more than 3,000,000 miles, might make the sun appreciably less intense, and so it would, other things being equal. But other things, most emphatically, are not equal, and they more than counteract the greater solar distance. Mainly the warmth of summer is a question of the sun's maximum height in the sky during the day. In June and July it climbs so high that its rays fall nearly vertically on the ground, and they are most concentrated. But in December when the sun, even at noon, is low the rays strike the earth at a grazing angle, and a beam of sunlight and heat, let us say, a yard square, may be spread over more than two square yards of ground.

Above Horizon Longer

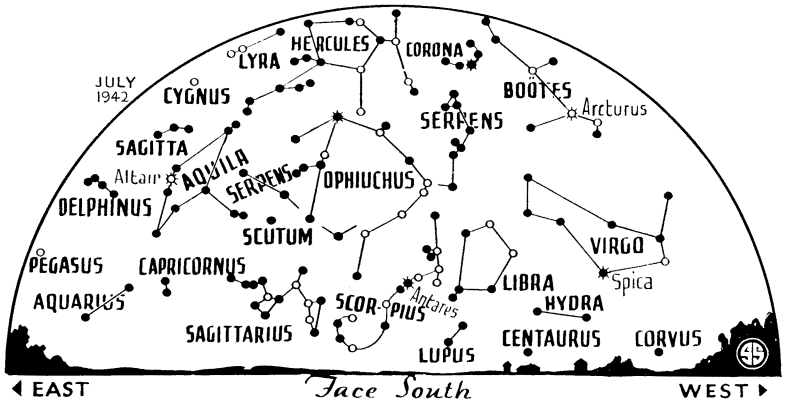
Another factor is that the sun at this time of year is above the horizon longer —the days are longer and the nights are shorter, so it has that much more time in which to produce its heating effect.

Turning now to the night-time sky, we can see not only the constellations containing the first magnitude stars, which were described above. There are also fainter constellations, many of which, like those already mentioned, date back to very early times. But the maps this month show four groups of which this is not true. Of these we know exactly who introduced them and when he did it.

To early astronomers, the only way of designating the position of a particular celestial object was to give its place with relation to the constellation figure. In some parts of the sky there are very few naked-eye stars, and so the ancients left these blank. But when the telescope was introduced in the 17th century stars were seen in these vacant areas. The first really big observatory was that established in Danzig, Poland, by the brewer, Johannes Hevelius, and he must have felt keenly the absence of constellations in certain parts of the sky. The result was that, in 1690, he published a new star atlas, with beautifully engraved plates, in which he introduced some new figures to fill up the holes.



Scutum, the shield, which represented the shield of the Sobieskis, the ruling family of Poland; Canes Venatici, the hunting dogs; Leo Minor, the lesser lion, and Lacerta the lizard, are those indicated on the maps. Another is Vulpecula, the fox, which is not shown, but lies just above Sagitta, the arrow. A sixth is Sextans, the sextant, now below the horizon and near Leo. Hevelius also introduced Cerberus, the three-headed monster, which he had Hercules holding. This alone of the seven is not recognized today; its stars are now included in Hercules.



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Celestial Time Table for July

Friday, July 3, 7:00 p.m., Venus passes Saturn. Sunday, July 5, 4:58 a.m., Moon in last quarter; 8:00 p.m., Earth farthest from sun, 94,421,000 miles. Monday, July 6, 6:00 a.m., Mercury farthest west of sun, visible for a few days about now before sunrise. Thursday, July 9, 4:39 p.m., Moon passes Saturn. Friday, July 10, 7:13 a.m., Moon passes Venus; 8:00 p.m., Moon farthest, distance 252,500 miles. Saturday, July 11, 11:30 a.m., Moon passes Mercury. Sunday, July 12, 6:01 a.m., Moon passes Jupiter. Monday, July 13, 8:03 a.m., New moon. Wednesday, July 15, 7:46 p.m., Moon passes Mars. Tuesday, July 21, 1:13 a.m., Moon in first quarter. Sunday, July 26, 5:00 a.m., Moon nearest, distance 223,800 miles. Monday, July 27, 3:14 p.m., Full moon. Tuesday, July 28, after midnight, Meteors of delta Aquarid shower.

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ASTRONOMY

Teaching of Air and Marine Navigation Together Urged

Astronomer Stresses Need To Teach Subject as an Operational Routine; Use Hydrographic Office Terms

THE importance of unified and simultaneous instruction in air and marine navigation, and the importance of training college students in the operational routine of navigation rather than in old-fashioned principles were stressed by astronomers discussing the teaching of navigation at the American Astronomical Society meeting in New Haven.

Dr. John Q. Stewart, of Princeton University, said that pretraining in navigation of the better-equipped college students had received the approval of high officials in the Navy. Service schools do not have time to insure the thorough mastery of navigation operations which are essential to avoiding disaster during military maneuvers, and they are also in great need of instructors in the paperwork of navigation.

College courses on navigation should include the latest methods of air navigation along with the older marine methods, Dr. Stewart said. This is particularly important in view of the growing cooperation between surface ships and air forces, which requires mutual understanding among navigators.

"It is not necessary to have a preliminary course in trigonometry and logarithms," Dr. Stewart stated, "far less in spherical trigonometry."

He stressed that navigation must be taught as an operational routine. "Graphical methods, linear interpolations, and judgment of tolerances should be taught well," he said.

Standard Hydrographic Office terminology ought to be used by all books and teachers of navigation, regardless of whether in air or marine phases. Dr. Stewart regards it as troublesome that manuals of navigation have been written for civilian and army pilots which deviate unnecessarily from standard methods and nomenclature. He recommended that the college teacher use Bowditch, the navy aircraft manual, the maneuvering board manual, and Dutton's book on navigation.

Relative motion was stressed by Dr. Newton L. Pierce, also of Princeton, as especially important in modern warfare. Navigation also includes piloting, dead reckoning, radio navigation, celestial navigation, and problems. Of these, only celestial navigation is strictly astronomical, yet hundreds of astronomers are called upon to teach the entire subject in the war emergency. Their students, in turn, become instructors of civil air corps pilots, army and navy men, and in civil aeronautics courses.

"Relative motion," said Dr. Pierce, "has been under-emphasized and often badly garbled in the various texts which treat of it at all. It is true that relative motion has little use in peace time marine navigation. It is, however, of great importance in war time for fleet maneuvers, and is important at all times for the air navigator. However, this is not a subject the student easily understands, and therefore, it should receive considerable emphasis, particularly by vector solutions, which may be made easily and quickly. The Princeton astronomers recommended that the methods of solution of navigational problems used by the Service schools be followed, and that the air almanac be used in preference to the nautical almanac wherever possible.

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PUBLIC HEALTH

Health Service Officer Stricken By Rabbit Fever

DR. CHARLES ARMSTRONG, Senior Surgeon, U. S. Public Health Service, and Director of the Division of Infectious Diseases of the National Institute of Health, has been suffering from a severe attack of tularemia (rabbit fever) since May 25.

He was taken sick a few hours after arrival on an official visit to the Rocky Mountain Spotted Fever Laboratory at Hamilton, Mont., which is one of the