

ASTRONOMY

Summer Stars Appear

Scorpion shines low in the southeast in June evening skies. Summer begins for northern hemisphere on June 21 at 9:03 a. m. EWT.

By JAMES STOKLEY

► AS SUMMER comes with the month of June, and on warm evenings we watch the stars make their appearance, we can see one constellation toward the south that seems characteristic of this season, just as Orion, the great warrior, is of winter. Orion is gone, but his traditional enemy (according to mythology), the scorpion, has come into view. This group—Scorpius, it is called—is low in the southeast, and is indicated on the accompanying maps. On these we have the appearance of the heavens about 11:00 p. m., local war time, at the first of June, and an hour earlier in the middle of the month.

Only two planets remain in the evening sky. Still the brightest is Jupiter, in Leo, the lion, which is toward the west, and is marked by the hook-shaped group called the sickle, with first magnitude Regulus at the end of the handle. Mars is in the next-door constellation of Cancer, the crab, and is approaching Jupiter, which it will pass on July 5. At present, because of its distance from earth, Mars is quite faint, of magnitude 1.9, which places it among objects of the second magnitude. Jupiter, on the other hand, is of magnitude minus 1.4, which makes it about 21 times as brilliant as Mars.

Out of Sight

Venus, which was shining so brightly in the early morning sky at the beginning of the year, is now almost directly beyond the sun, a position which it reaches on June 26. After that, it becomes an evening star, remaining in the west after sunset, though it will be some weeks before we begin to see it.

For a similar reason Saturn has also gone from sight, and it will be directly beyond the sun on June 21. Mercury likewise is too nearly in the sun's direction to be visible during the month.

Coming to our stars of the month, we have several other conspicuous constellations in addition to Scorpius, in which shines the bright—and red—An-

tares. High in the south is Bootes, the bear driver, with first magnitude Arcturus. A little lower is Virgo, in which Spica shines. Regulus, in Leo, is in the west, as already mentioned, and very low in the northwest are Pollux, in Gemini, the twins, and Capella, in Auriga, the charioteer. Although these are shown on the maps, they are so low that they are not conspicuous.

To the northeast, however, in a position where they are coming into view in the evening sky, is the trio of Lyra, the lyre; Cygnus, the swan; and Aquila, the eagle. Each of these contains a first-magnitude star; namely Vega, Deneb and Altair. The large triangle which these orbs make in the sky is a good one to know, to help you to find your way among the stars.

Summer Arrives

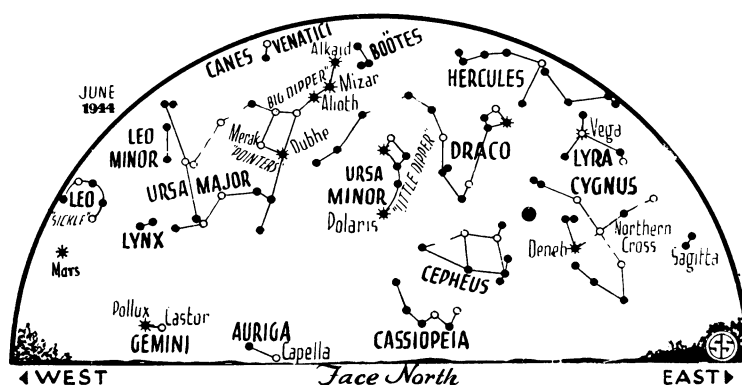
With June also comes the beginning of the northern hemisphere summer, for this starts with the summer solstice, the time when the sun is farthest north of the equator. This year it occurs on June 21 at 9:03 a. m., EWT. Then the sun, for us in the northern hemisphere, reaches its highest noonday position. Its rays fall on the ground most directly, and are more concentrated. This, and the fact that it is above the horizon longer than at any other time of year, is responsible for the greater heating of this part of the earth. It takes a while, however, for the earth to become heated, and therefore our highest temperatures

come several weeks after the solstice, when we are actually getting the most heat from the sun. Similarly, it takes time to cool, and the lowest winter temperatures come in January, some time after the winter solstice just before Christmas, when the radiation from the sun is least.

South of the equator, the sun is now low in the north at noon, and this is, for the people there, the beginning of winter. On the other hand, December is the start of their summer, a curious fact which has become familiar to many of us whose relatives and friends are serving "down under" with the armed forces.

Times Agree

Speaking of the sun, this month also brings one of the four dates during the year when the sun is "on time," that is, when sundial time and "clock" time agree. Because of the fact that the path of the earth around the sun is not a circle, but an ellipse, and also because the axis of the earth is not at right angles to the plane in which it revolves around the sun, the length of the day as measured from the sun varies over a range of nearly a minute during the year. This means that a clock which kept sun time would have to run faster at certain times of year and slower at others. As it would be inconvenient to have such clocks, we use "mean" time, which is constant through the year, but maintains a sort of average of sundial time. In February the sun is behind the clock by nearly 15 minutes, while around election day, in November, it is about 17 minutes ahead. On June 1, the sun is 2 minutes 24 seconds early, while at the



end of the month it is 3 minutes 35 seconds late. On June 14, however, it crosses the meridian just at noon by clocks set to local time.

This, however, is not the whole story, for our clocks are not set to local mean time. Years ago they were, but that meant that whenever you moved east or west you had different kinds of time, and had to change your watch by some odd number of minutes. To obviate this, which was especially troublesome to the railroads, standard time was introduced, and the entire eastern part of the country, for example, used eastern standard time, which is the local mean time for places which have longitude 75° West, of which Philadelphia is an example. Along the 75th meridian, therefore, local mean time and standard time were the same. The same was true along the 90th meridian, the center of the Central time zone, along the 105th meridian, from which Mountain time was taken, and in the Pacific Time zone, along the 120th meridian. Therefore, along these meridians on June 14, you can tell standard time by looking at the sundial, and if you add an hour to that, you will have your local kind of War Time.

Celestial Time Table for June

June	EWT	
6	2:58 p. m.	Full moon.
11	8:00 p. m.	Moon nearest; distance 229,400 miles.
13	11:56 a. m.	Moon in last quarter.
20	1:00 p. m.	New moon.
21	9:03 a. m.	Summer solstice, summer commences.
24	1:24 p. m.	Moon passes Mars.
	10:11 p. m.	Moon passes Jupiter.
26	8:00 p. m.	Moon farthest; distance 251,300 miles.
28	1:27 p. m.	Moon in first quarter.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, May 27, 1944

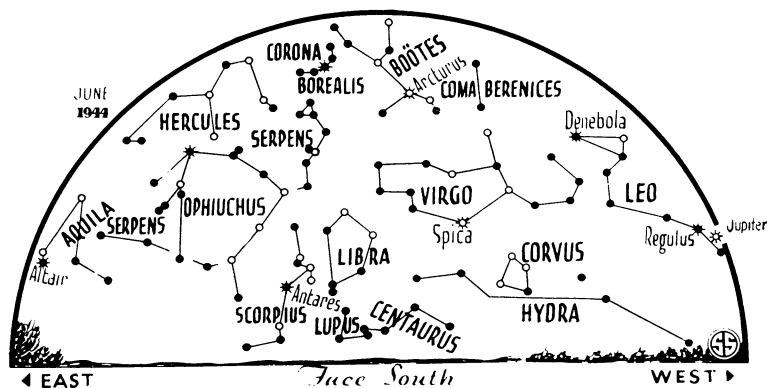
PHYSIOLOGY

New Explanation Given For Pain in Aviators' Bends

➤ A NEW explanation of the cause of pain in aviators' bends was presented by Dr. Joseph P. Webb and associates of the University of Cincinnati College of Medicine at the Atlantic City, N. J., meeting of the American Society for Clinical Investigation.

These scientists differ from the widely held view that the painful bends feature of decompression sickness which attacks high altitude flyers is due to stoppage of circulation by nitrogen bubbles forming in the blood vessels.

The bubbles, the Cincinnati scientists believe, are formed in the tissues about the joints, not in the joint space and not within the blood vessels.



◊ * ◦ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Applying pressure to a painful area, for example, inflating a blood-pressure cuff around the knee, relieves the pain even when pressures great enough to obliterate the blood flow are used, they found. If stopping the circulation were causing the pain, this would be expected to make it worse.

The specific pattern of bends pain may be reproduced exactly in most cases by reexposing the person within a short interval, up to six hours, to the high altitude condition that brought on the trouble. This indicates, the scientists point out, that the circulation has not removed

the bubble. If the bubble causing the pain had been within the blood vessels it would have been either redissolved or carried off.

The skin and nervous system features of decompression sickness, apart from the painful bends, are due to spasm of the blood vessels rather than stoppage.

Associated with Dr. Webb in these studies were Dr. Joseph P. Webb, Dr. G. L. Engel, Dr. John Romano, Dr. H. W. Ryder, Dr. Charles D. Stevens, Dr. M. A. Blankenhorn and Dr. Eugene B. Ferris, Jr.

Science News Letter, May 27, 1944

"Gamow has done it again!"

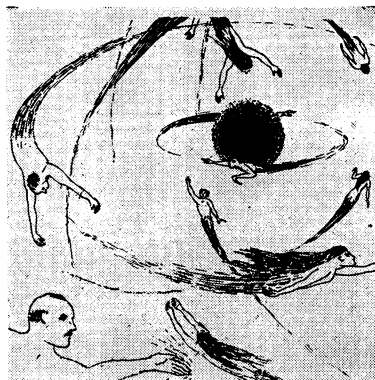
—NEW YORK HERALD TRIBUNE

Mr Tompkins

Explores the Atom

By George Gamow

The sequel to Mr Tompkins in Wonderland



"This book will be just as successful as its predecessor. It translates into every day language the vast store of information now available concerning the components of the atom. No longer need such items as the Pauli-principle, Dirac's electron-ocean, nuclear fission, the neutrino and the meson remain outside the pale of after-dinner conversation."—*Scientific Book Club* \$2.00

Follow these new fantastic adventures as

MR TOMPKINS EXPLORES THE ATOM

CAMBRIDGE UNIVERSITY PRESS

THE MACMILLAN COMPANY

60 Fifth Avenue, New York 11, N. Y