

ASTRONOMY

# Constellations Shine

As the new year begins, astronomers prepare for the events to come, including two solar eclipses and one lunar, and the opportunity to study Mars as it approaches the earth.

By JAMES STOKLEY

► WITH THE BEGINNING of a new year, the winter constellations shine in the evening sky in their full glory. These are shown on the accompanying maps, which depict the sky as it appears about 10:00 p.m., your own kind of standard time, at the beginning of January, an hour earlier at the middle of the month and two hours earlier as the month comes to a close.

No planets are indicated as none are visible during these hours, although Venus may be seen earlier, in the first part of January.

Around Jan. 1, it sets more than two and one-half hours after the sun. Until then, Venus shines brilliantly in the southwest. However, it is rapidly drawing into line with the sun, and will be nearly in front of it on Jan. 28, in the position called inferior conjunction. By then, of course, it will be invisible, since it goes below the horizon as the sun does.

By the middle of February, as Venus swings to the west of the sun, it will be a morning star, shining low in the southeast just before sunrise.

Sirius, the dog-star, is the brightest star of the January evenings. This is in the southeast, as shown on the maps, in the constellation of Canis Major, the great dog. Above it, and to the right, is the magnificent constellation of Orion, the warrior, with the three stars in a row that mark his belt. Above the belt, to the left, is Betelgeuse, brightest star in this group, and below, to the right, shines Rigel.

## Aldebaran: Bull's Eye

Still higher than Orion, and farther right, is Taurus, the bull, with the ruddy star Aldebaran that marks the animal's eye. High in the east, above and to the left of Betelgeuse, we find Gemini, the twins, with Pollux as the brightest star. Below this group, towards Canis Major, is Canis Minor, the lesser dog, with the star Procyon. Directly overhead, for the times that the maps are prepared, stands Auriga, the charioteer. In this is the bright star Capella, second only to Sirius among the stars now visible.

Looking toward the east, the constellation of Leo, the lion, is making its appearance. The part shown on the map represents his head and shoulders, for his hind quarters are still below the horizon. In the part depicted, however, we find the brightest star in the group, called Regulus, although its low altitude causes a dimming of its light.

January's other planets all appear after

midnight. First to rise is Jupiter, which comes above the eastern horizon, in the constellation of Virgo, the virgin, about 1:30 a.m. Although inferior to Venus in brightness, it is about as bright as Sirius, which makes it quite conspicuous. At approximately 5:00 a.m., Mars rises, in Scorpius, the scorpion, just to the left of the star Antares. At present Mars is rather faint—about the brilliance of a second magnitude star such as Polaris, the pole star. A little later Saturn rises, about twice as bright as Mars.

## Mercury Rises Early

On Jan. 15 Mercury, which will then be in Sagittarius, the archer, will be farthest west of the sun, and will rise before sunrise. Thus, for a few days around this date it may be possible to get a glimpse of it near the southeastern horizon as dawn is breaking. It will then be nearly twice as bright as Saturn but hard to see because of the brightness of the sky.

While some astronomical events can be predicted, others happen unexpectedly. For

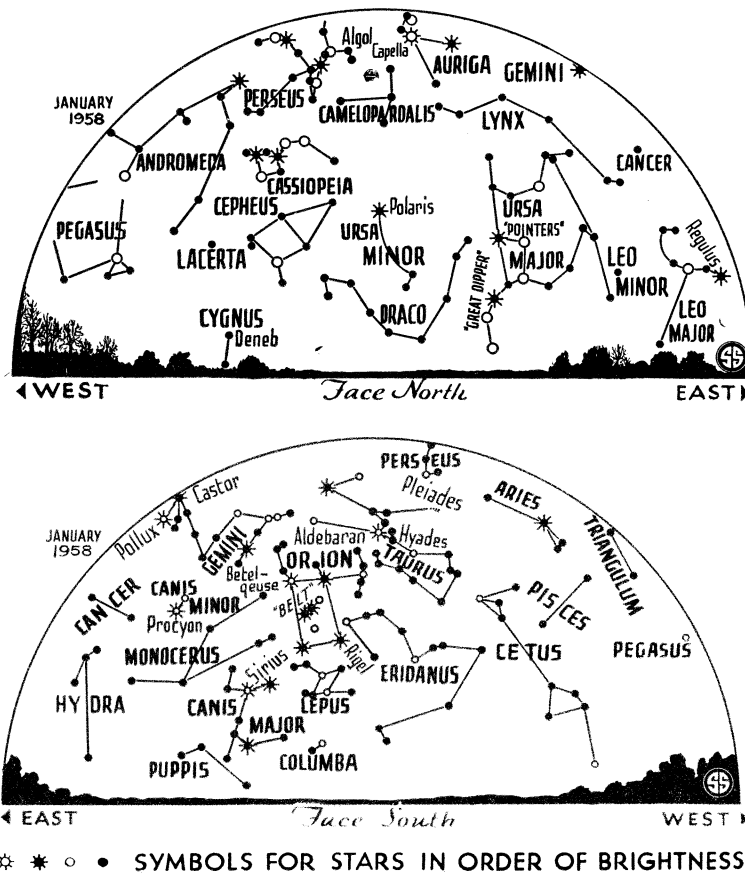
example, 1957 brought two naked-eye comets, the first in a number of years, which no one had foreseen in January. Several periodic comets are scheduled to return in 1958, but none will be conspicuous to the naked eye. However, among the predictable events there are several interesting items on the 1958 program of the skies.

There will be two eclipses of the sun, neither visible in the United States and Canada. The first of these will occur on April 19, which will be an annular eclipse. This is one that occurs when the moon is farther away from us than usual, so that its apparent size is less than that of the sun. Thus, even though the moon will pass directly in front of the sun, for some locations on the earth, it will not completely cover it. Around the dark disc of the moon there will appear a complete ring, or "annulus," of the solar disc.

The effect will be visible along a path beginning in the Indian Ocean southeast of India. From there it passes over Siam and Viet Nam, Formosa, the East China Sea, the Ryukyus, south of Japan, and ends in the Pacific Ocean. Over nearly all of Asia, except the northwestern part, Indonesia, the Pacific Ocean and Alaska, a partial eclipse of the sun will be seen.

## Total Eclipse of the Sun

The second eclipse of the sun will occur on Columbus Day, Oct. 12. This is total, with the moon completely covering the sun, for more than five minutes at the most favorable location. The path of totality,



along which the total phase will appear, will be a hundred miles wide, starting as the sun rises at a point on the equator north of the Solomon Islands, in the southwestern Pacific Ocean. This path, which is traced out by the moon's shadow as it races eastward, passes over some small islands in the Union and Danger groups, which are north and northeast of Samoa. Finally the path reaches the coast of Chile, near Valparaiso, and it ends as the sun is setting, at a point in Argentina, near the city of Cordoba.

Total eclipses of the sun offer astronomers a chance to make many observations which cannot be made at other times, or at least not as well. Thus, it is likely that many of them will undertake expeditions to the Pacific islands where this eclipse will be visible.

There will also be an eclipse of the moon, which occurs when the earth comes between the sun and moon, on May 3. This, however, will be only partial, with a maximum of about 15% of the moon's diameter getting into the earth's shadow. This will be visible in the western parts of the United States and Canada, over most of the Pacific Ocean, eastern Asia, Australia and Antarctica.

In 1958 Mars will again come close to the earth, not as near as it did on Sept. 7, 1956, when it was only 35,120,000 miles away, but much closer than it will come again for several years. This will be on Nov. 8, with a distance of a little more than 45,310,000 miles.

On Jan. 1 Mars is far out beyond the sun, 212,000,000 miles from earth, but until November it will be moving in. On April 1, it will be at a distance of 154,000,000 miles; July 1, 101,000,000 miles; Oct. 1, 55,000,000 miles and Nov. 1, 45,800,000 miles. At the time of its closest approach it will be of magnitude minus 1.9, or about 25 times as bright as it is now. Thus, it will be interesting to watch it during the year, as it gradually increases in brilliance.

By next autumn, many astronomers will be watching Mars, hoping to solve some of the many problems presented by this red planet.

### Celestial Time Table for January

#### JAN. EST

|    |            |  |
|----|------------|--|
| 3  | 9:00 a.m.  | Earth nearest sun for year, distance 91,342,000 miles.                           |
| 5  | 3:09 p.m.  | Full moon.   |
| 8  | 7:00 p.m.  | Moon nearest, distance 227,600 miles.  |
| 10 | 12:48 a.m. | Algol (variable star in Perseus) at minimum brightness.                          |
| 12 | 9:01 a.m.  | Moon in last quarter.  |
|    | 9:38 p.m.  | Algol at minimum.  |
| 13 | 12:12 a.m. | Moon passes Jupiter.   |
| 15 | 6:27 p.m.  | Algol at minimum.  |
|    | 11:00 p.m. | Mercury farthest east of sun, visible for a few days low in east before sunrise. |
| 19 | 5:08 p.m.  | New moon.  |
| 23 | 5:00 a.m.  | Mars passes Saturn.  |
| 24 | 7:00 p.m.  | Moon farthest, distance 251,800 miles.   |
| 27 | 9:16 p.m.  | Moon in first quarter.   |
| 28 | 3:00 p.m.  | Venus between earth and sun (inferior conjunction).                              |

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

Science News Letter, December 28, 1957

## Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**AIDS TO MATERIA MEDICA AND THERAPEUTICS**—J. W. Hadgraft—*Baillière*, Tindall and Cox (*Williams and Wilkins*), 5th ed., 259 p., \$3.25. Indicating to medical students the way drugs are formulated and alternative preparations available.

**AIRCRAFT ANNUAL 1958**—John W. R. Taylor, Ed.—*Philosophical Lib.*, 96 p., illus., \$6. Telling what is new overhead.

**ANTHROPOLOGICAL PAPERS, NUMBERS 49-56**—Jesse D. Jennings, Gordon R. Willey and Marshall T. Newman and others—*Govt. Printing Office*, Bureau of American Ethnology Bulletin 164, 355 p., illus., paper, \$2.75.

**BASIC ELECTRICITY**—Rufus P. Turner—*Rinehart*, 396 p., illus., \$6.50. Text for beginning students.

**BODY WATER IN MAN: The Acquisition and Maintenance of the Body Fluids**—Maurice B. Strauss—*Little*, 286 p., illus., \$7. Survey of the physiological mechanisms by which the volume and osmotic composition of the body fluids in man are maintained in dynamic equilibrium.

**THE CREATION OF THE UNIVERSE**—George Gamow—*New American Library*, 144 p., illus., paper, 50 c. The third book of the author's trilogy on the sun, the earth and the universe as a whole.

**ENGINEERING FLUID MECHANICS**—Charles Jaeger, translated from the German by P. O. Wolf—*St. Martins*, 529 p., illus., \$11.50. Covering the methods of analysis and calculation required for the design of water-power schemes.

**GOOD NEWS FOR STROKE VICTIMS**—Elizabeth Ogg—*Public Affairs Committee*, Public Affairs Pamphlet No. 259, 28 p., illus., paper, 25 c. The chances for overcoming the effects of a

stroke are much greater today than they were even four or five years ago.

**HELPING YOUR CHILD TO READ BETTER**—Robert M. Goldenson—*Crowell*, 312 p., illus., \$3.95. What the parent can do to help his child to read and, before school age, to get him ready to learn.

**HOW TO DO AN EXPERIMENT**—Philip Goldstein, Paul F. Brandwein, Gen. Ed.—*Harcourt*, 192 p., illus., \$2.60. Telling the junior scientist about scientific methods and giving him ideas for science projects and exhibits for Science Fairs.

**AN INTRODUCTION TO AUTOMATIC COMPUTERS**—Ned Chapin—*Van Nostrand*, 525 p., illus., \$8.75. So that people in business can understand the uses and limitations of computers.

**PAPERS PRESENTED AT THE FALL 1957 RTCA ASSEMBLY MEETING**—*Radio Technical Commission for Aeronautics*, illus., paper, 60 c. Discussing, among other matters, the guided missile and satellite programs and air traffic control.

**PHYSICS AND CHEMISTRY OF THE EARTH: 2**—L. H. Ahrens, Frank Press, Kalervo Rankama, and S. K. Runcorn, Eds.—*Pergamon*, 259 p., illus., \$10. One of an annual series of up-to-date surveys of progress in the field.

**QUANTITATIVE PLANT ECOLOGY**—P. Greig-Smith—*Academic*, 198 p., illus., \$6. Plant ecology is at present in a transitional stage into the quantitative outlook.

**SMITHSONIAN INSTITUTION ANNUAL REPORT OF THE BOARD OF REGENTS**—Leonard Carmichael, Secretary—*Govt. Printing Office*, 580 p., illus., \$4.50. Containing, as usual, a collection of articles of timely scientific interest.

**STRENGTH OF MATERIALS**—F. R. Shanley—*McGraw-Hill*, 783 p., illus., \$8.50. A first text in college courses in engineering and science.

**THE WARBLERS OF AMERICA: A Popular Account of the Wood Warblers as They Occur in the Western Hemisphere**—Ludlow Griscom, Alexander Sprunt, Jr. and Others, Eds.—*Devin-Adair*, 356 p., illus. with drawings and paintings by John Henry Dick, \$15.00. This beautiful book is intended for the beginner as well as for the serious bird student.

Science News Letter, December 28, 1957

## MATHEMATICS FOR EVERYMAN

From Simple Numbers to the Calculus  
by EGMONT COLERUS

Egmont Colerus is one of that all-too-small band of gifted teachers who know how to COMMUNICATE mathematics.

Once caught in his "trap" there is no escape—one is compelled to go on at least as far as the calculus, with fascinating glimpses of mathematical history and philosophy along the way.

Little or no previous knowledge of mathematics is assumed. Every point is illustrated with an example. Such is Colerus' talent that long before the reader knows what is happening, he finds, amazingly, that he has acquired a ready grasp of the fundamentals of mathematical operations and mathematical reasoning. More, some of the magic, the greatness, the beauty of the science has somehow rubbed off onto him, to his permanent enrichment.

**PARTIAL CONTENTS:** Numbers • The System of Tens • Other-Number Systems • Symbols and Commands • Arrangement • Permutation • Combination • Other Kinds of Arrangement • First Steps in Algebra • Fractions • Equations • Negative and Fractional Powers • Irrational Numbers • Generalized Decimal Fractions • Algebraic Functions • The Theorem of Pythagoras • Functions of Angles • Imaginary and Complex Numbers • Co-ordinates • Analytical Geometry • Squaring the Circle • Calculating the Lengths of Curves • Differentials and Integrals • Three Kinds of Smallness • The Binomial Theorem • Archimedes' Quadrature of the Parabola • Series • The Technique of Differentiation • Mean Value and Definite Integrals • Problems of Area • Logarithms • Interpolation, Extrapolation • Conclusion. Illustrations throughout.

ORDER NOW!

MATHEMATICS FOR EVERYMAN

by Egmont Colerus

\$3.95 Postfree • 10-Day Money-Back Guarantee

EMERSON BOOKS, Inc., Dept. 236-L

251 West 19th Street, New York 11

## Free to WRITERS

seeking a book publisher

Two fact-filled, illustrated brochures tell how to publish your book, get 40% royalties, national advertising, publicity and promotion. Free editorial appraisal. Write Dept. SN-12

Exposition Press / 386 4th Ave., N.Y. 16



**SPANISH** (American or European) • **FRENCH**  
**GERMAN** • **ITALIAN** • **JAPANESE**  
**MODERN GREEK** • **ICELANDIC**

—any of 34 languages available AT HOME

Only Linguaphone. The World's Standard Conversational Method, brings 8 to 12 of the world's best native language teachers into your home.

You listen to life-like, conversational recordings for just 20 minutes a day. You hear men and women speak—YOU Understand—YOU SPEAK. Over a million home-study students of all ages. Write today for FREE Book and details of FREE TRIAL. No obligation. Linguaphone Institute, T-31-127 Radio City, New York 20, N. Y.