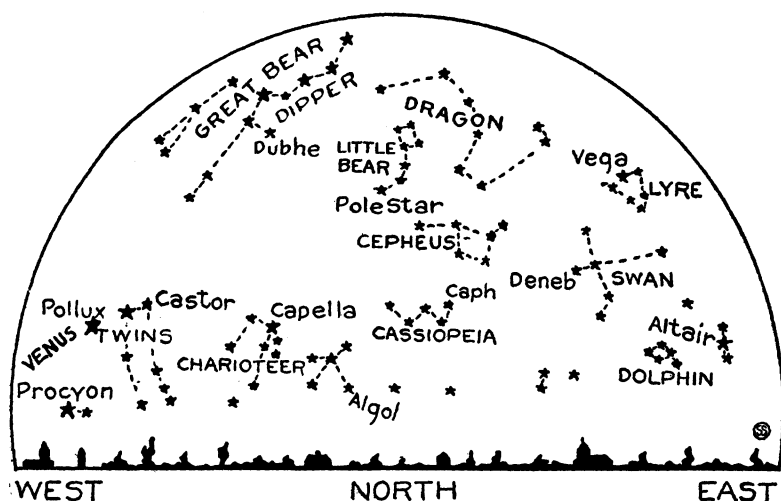


# Eclipse and Comet in June Skies



By JAMES STOKLEY

After a winter and spring in which events of importance in the heavens have been scarce, summer opens with a bang for the astronomer. Scarcely has summer commenced, on June 22 as the sun reaches a point directly overhead at noon on the Tropic of Cancer at 5:22 a. m., Eastern time, when the Pons-Winnecke comet comes within 3,500,000 miles of the earth, closer, so far as we know, than any comet has in the past. The comet is nearest on June 27. And then, on June 29, the most impressive of all heavenly phenomena, a total eclipse of the sun, occurs, which, unfortunately, will not be seen in the United States. But before that time, on the early morning of June 15, the United States will have the opportunity of seeing an eclipse of the moon, which, though not of the scientific importance of a sun eclipse, is always interesting.

Like any eclipse, whether of the sun or moon, these two are due to the fact that the earth and the moon, each illuminated by the sun, cast a shadow into space behind them. As this space is empty, we are not ordinarily aware of this long cone of shadow, but on the fifteenth, when the moon will get into the shadow of the earth, its presence will be evident. An then, fourteen days later, when the moon has gone halfway around the earth in its orbit, its shadow will sweep across the surface of the earth, and people who are in the path of the shadow, and are fortunate enough to have clear weather, will see the sun totally eclipsed.

Every 14 days the sun, the moon

and the earth are almost in line, first at new moon, when the moon is in the middle, and then at full moon, when the earth is between the sun and the moon. But the three bodies are not always exactly in line. Ordinarily when the moon is new, its shadow goes to the north or south of the earth, while at most full moons, the earth's shadow misses falling on the moon. If this were not the case, there would be an eclipse at every new and full moon. However, on June 15 the moon is at what is called a node in its orbit, and then our earthly shadow falls squarely on it. Throughout the United States, the eclipse will be visible.

## Eclipse's Time Table

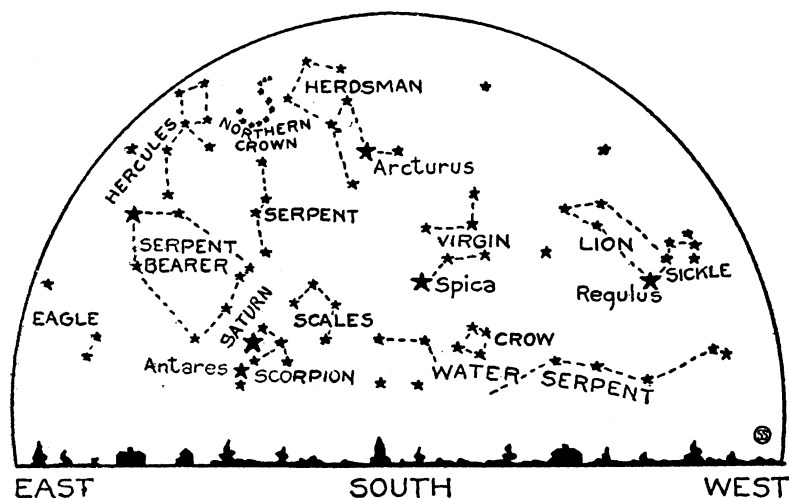
The time table of the eclipse will be as follows: at a little after midnight on the morning of the 15th, 12:34 a. m. Eastern Standard Time,

to be more exact, the moon enters the penumbra, the outer part of the earth's shadow, and in which a person would see the sun partly covered by the dark disc of the earth. This is shown as No. 1 in the small diagram. At 1:43 a. m., Eastern Standard Time, the moon begins to enter the umbra, the dark inner part of the shadow, where an observer would not be able to see the sun at all, because the earth would completely hide it. It is now in the position of No. 2. An hour and a half later, at 3:13 a. m., the moon has completely entered the umbra, and would entirely disappear from view were it not for the earth's atmosphere. We are able to see the sun even after it has set below the horizon, because the layer of air through which its light has to pass, bends the ray of light. A similar bending of light occurs when a ray of light passes from water to air, and makes a straight stick, partly immersed, look bent.

For the same reason, the atmospheric layer bends the sunlight around, and into the shadow cone, but the shorter rays are absorbed. Only the longer rays of the sunlight, the red ones, get through in large quantity, and so the eclipsed moon has a reddish hue. Just how much light is thus refracted, or bent around into the shadow, depends to some extent on the weather on the earth, in the circle over which the sun's rays just graze.

As this eclipse is peculiar in that the moon just barely gets within

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HERE IS A PICTURE OF THE SKY THESE JUNE EVENINGS. Just hold the maps in front of you like a picture. Face north when using the one above. Face south when using the one below.

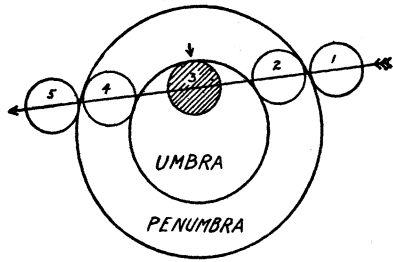


DIAGRAM OF ECLIPSE OF MOON,  
June 15, 1927.

### June Skies

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the umbra, it offers a good chance to test the effect of atmospheric conditions on the light that passes through it.

The middle of the eclipse, represented by No. 3 in the diagram, comes at 3:24 a. m., Eastern Time. The part of the eclipse moon indicated by the arrow will be just barely within the inner shadow, and will probably be the brightest part of the eclipsed moon. The principal light that illuminates the eclipsed moon, because it is bent the least, will just graze the earth on a line running from Great Slave Lake, in the Northwest Territories of Canada, across Baker Lake, which drains into Chesterfield Inlet, on the west coast of Hudson Bay, to Nova Scotia. Dr. Willard J. Fisher, of the Harvard College Observatory, who makes a study of such matters, has requested any travelers that may be in these regions to note carefully the weather conditions at the moment, 3:24 a. m., Eastern Standard Time, and to report to him.

With the aid of Professor R. Meldrum Stewart, director of the Dominion Observatory at Ottawa, Dr. Fisher has secured the cooperation of the Royal Canadian Mounted Police, Catholic missionaries to the Eskimos, and fur trappers, who will report the weather conditions at the time. Mr. G. A. Wendt, of the Canadian Westinghouse Company, has also arranged to have appeals for such weather observations sent out by radio.

However, as the sun will just be rising, and eclipsed moon just setting in this region, it will not be a good place to observe the eclipse itself. In the northeastern part of the United States, the eclipsed moon will be low in the south. In the southwestern part of the country, it will be in the southeastern part of the sky at the time, and higher than northeasterners will see it. Observa-

tions made in the United States of the eclipse itself will be compared by Dr. Fisher with weather reports from Canada, in an effort to determine the effect of the earth atmosphere.

As amateurs, with small telescopes, or even with the unaided eye, may be able to make observations that will be missed at the big observatories on account of cloudy weather, Dr. Fisher requests any person who has the opportunity to do so, to report their results to him.

"Such persons," he says, "should note the following points, with instruments of any size, from opera glasses up, and with the naked eye:

"Geographical position, time zone, weather and sky conditions; time of each observation; size and powers, even of opera glasses, for each observation; times of contact of the edge of the moon and the edge of the shadow; description of the edge of the shadow; when and how the red color appears and disappears; spots or blotches apparently going across the moon during eclipse, and so distinct from the ordinary lunar markings; and the visibility of the surface details of the moon, with the naked eye, and a variety of instruments, if possible.

"A special observation, easy to make, and of interest, is of the visibility of the moon's features through colored glass. The easiest to get is blue cobalt glass, but good green glass, or ruby glass, like the photographer uses in his dark room lantern, are more valuable, as they pass light more nearly of a single color. Such observations may also be made either with the naked eye of a telescope."

Results of such observations should be sent to "Lunar Eclipses, Harvard College Observatory, Cambridge, Mass."

Because it is just barely a total eclipse, it is soon over, and at 3:35 a. m., eleven minutes after the middle of the eclipse, the moon begins to emerge from the umbra, or inner shadow. At 5:06 a. m., it has emerged completely, in position No. 4, and at 6:15 it has left even the partly darkened area of the penumbra as shown by No. 5.

### Little Scientific Value

Outside of the atmospheric observations mentioned, there is little scientific value to a lunar eclipse, but it is always a striking phenomenon, and will be well worth staying up to the wee, sma' hours of

the morning of June 15 to see. As the moon is partly immersed in the umbra, the round edge of the earth's shadow may be observed on its face—one of the most striking proofs of our globe's rotundity.

Two weeks later, the moon has traveled half-way around in its orbit. It is now, on June 29, between the earth and the sun, or in the phase of new moon, and as it is also at a node, it comes exactly between the two bodies, and we have an eclipse of the sun. The fact that a lunar eclipse must occur at full moon, and a solar one at new moon, and that the two cannot be closer than 14 days apart, has gotten more than one fiction writer into trouble. A prominent English author once had a full moon rising on the night following an eclipse of the sun, while another character in a novel once had the unique experience of seeing an eclipse of the sun and one of the moon on the same day! In this case, fiction was a stranger to truth!

On June 29, then, the shadow of the moon sweeps across the face of the earth, but, unfortunately for Americans, nowhere touches the United States, as it is all over by the time the sun rises on our country. The elliptical shadow, in which the sun is seen totally eclipsed, passes over Wales and England, crossing Liverpool on the Irish Sea, and West Hartlepool on the North Sea, then over Norway, crossing the city of Stavanger, goes northward through the approximate center of the Scandinavian peninsula. Then it crosses the Arctic Ocean, just missing the northern tip of Novaya Zembla, comes to land again to cross the northeastern corner of Siberia, and finally leaves the earth just after crossing the Aleutian Islands.

### Norway Best Location

Much of the path of totality over which the shadow passes is rather inaccessible, as in Siberia; the chances for clear weather in England are not very good, as it occurs there just after sunrise, about 5:25 a. m., Greenwich time. Norway seems about the best location, and that is where many of the astronomers who want to observe it are locating their instruments. Of course the English astronomers are making every preparation to watch it, in the hope that it will be clear, but Professor Samuel A. Mitchell, of the University of Virginia, who will head the only American expedition,

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## June Skies

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has gone to Fagernes, in Norway. With him is Dr. Harlan T. Stetson, of Harvard University.

In England, the coming eclipse has attracted tremendous popular interest, just as the one of January, 1925, did in the United States. It is the first eclipse that has crossed the British Isles since 1724, and the last until 1999, so a large portion of the British population will be concentrated along the path of totality for the half-minute that the eclipse will last. In Norway, it will last a few seconds longer, and the sun at the time will be higher in the sky. Both of these factors are advantageous to the astronomer, and are additional reasons for the choice of Norway.

## Comet Nearby

The comet which makes such a close visit to the earth in June is really of more scientific than general interest. It is a rather small comet, as comets go, and on previous visits has never showed a tail, which most people consider one of the earmarks, or perhaps "tailmarks," of a comet. Its only interest at this time is found in the fact that it is coming so close, and will be only about 3,500,000 miles away on June 27, or about fourteen and a half times as far as the moon, and much closer than any other astronomical body ordinarily comes.

However, it is the close approach of a comet to the sun that excites it to brilliance, and when closest to that body, on June 21, it will still be nearly a hundred million miles away. At the closest position to the earth, it will be in the constellation of Aquila, near the bright star Altair, which, this month, is directly south about 3:00 a. m. With a small telescope, it will be easily visible as a faint patch of light, and may even be visible to the unaided eye, as it will be just about at the limit of brightness required for naked eye visibility, about the sixth magnitude.

The comet is a historic one, despite its small size. First discovered by a French astronomer, named Pons, in 1819, at Marseilles, it was then lost until Winnecke, a German astronomer at the University of Bonn, found a comet in 1858, which proved to be the same one. Its period, or the time between successive returns to the neighborhood of the sun, is a little over six years, and since Winnecke rediscovered it,

(Just turn the page)

## PSYCHIATRY

### Missing the Feeble-Minded

The pathetic picture of the unrecognized feeble-minded child, struggling along in school, with dull face and open mouth, having tonsils out, adenoids out, eyes tested, all to no avail, was presented before the recent meeting of the American Association for the Study of the Feeble-Minded, at Cincinnati, by Dr. H. H. Ramsay, superintendent of the Mississippi School and Colony for Feeble-Minded.

Medical schools give such limited courses in the brain and nervous system that doctors often do not recognize signs of inherited abnormality, Dr. Ramsay pointed out.

The physical basis of feeble-mindedness is well established, he said: "On post mortem examination, the brains of feeble-minded persons show three distinct features as compared to normal brain. First, imperfection of the cells; second, numerical deficiency of cells; third, irregular arrangement of cells.

"Furthermore, we are now certain that actual brain pathology of inherent character is translated into social pathology. As examples, there are the feeble-minded prostitute, the feeble-minded criminal, the pauper, the psychopath, and many other abnormalities due to subnormal intelligence or to an inherently unstable nervous system."

The physician cannot ignore this problem, and he has a great service to render in reducing these inherited abnormalities, Dr. Ramsay said. One scientist who studied family histories of 200 feeble-minded individuals found that 80 per cent of them were descendants of individuals with pronounced nervous disease. Syphilis is found to play an important part in producing these defectives.

"With the passing of the old order of things and new teaching, with ample clinical material at hand," said Dr. Ramsay, "the physician of the present and future should be better prepared to advise his clientele accurately concerning these varieties of defect which in the main are innate and not amenable to cure or even treatment by drugs or gland extracts. These instead are subjects for proper training, suited to their ability, or life-long care and supervision."

How a large group of girls whose minds have stayed like those of very little children are being successfully taught to dress themselves, to take care of themselves, and to make use-

(Just turn the page)

## SEISMOLOGY

### Quake Possibly in China

Months may elapse before details of the earthquake which was felt by seismograph instruments throughout the world on Sunday, May 22, are known, even though it was one of the most severe quakes on record and thousands were undoubtedly killed. According to Commander N. H. Heck, in charge of the earthquake investigations of the U. S. Coast and Geodetic Survey, after studying reports from seismograph observatories gathered by Science Service, the quake was about 35 degrees north latitude and 100 degrees east longitude, which places it in western China or eastern Tibet. It occurred at 5.33 P. M., eastern standard time.

This region is one that has been visited by destructive quakes in the past, for on September 16, 1920, there occurred the Kan-Su earthquake in the same region, named after the province of China in which it occurred. At this time, though the damage was severe and an estimated total of 100,000 persons were killed, it was three months before the outside world knew about it.

(Just turn the page)

## ARCHAEOLOGY

### Derrick Saves Totem Poles

The Dominion Government Totem Pole Preservation outfit has arrived at Skeena Crossing, B. C., with a flat car load of hoisting gear, including the huge derrick used for erecting fallen poles. This gear came from the totem pole village of Kitwanga where the government work of totem pole preservation was carried on during the past two seasons to the great interest of the tourists who are allowed to walk through the Githsan Indian village while the trains stop for water.

This year the work of totem pole preservation will be carried on at Gytsegyuela, a village about a mile below Skeena Crossing, where there are eighteen huge totem poles close to the river bank plainly seen from the railroad car windows for over half a mile on the opposite side of the Skeena river. The northern end of the Pacific highway is at present within four miles of Gytsegyuela so that automobile parties from many parts of the United States can now come close to this remarkable collection of totem poles and in a few weeks the road gang will resume work on the highway and push it on past Skeena Crossing, Gytsegyuela and well towards Kitwanga during the present season.

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### Chinese Earthquake

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According to Commander Heck, the quake on May 22 appears to have been at least as severe as the one in 1920. In some respects this country resembles California, for the fault lines, along which the quakes occur when the two parts of the ground slip over each other, tend to run east and west. The damage that was done by the quake may have been in Tibet, as well as in the Kan-Su province of China. Much of the damage done by quakes in this region is due to landslides, caused when the loose soil is shaken. These may also bury whole villages, which may never be heard from again.

The reports upon which Commander Heck's determination was based were gathered from the seismographic observatories of the U. S. Coast and Geodetic Survey at Cheltenham, Md., and Honolulu, T. H.; that of the U. S. Weather Bureau at Chicago; the University of California at Berkeley; Georgetown University, Washington; St. Louis University, St. Louis; Regis College, Denver, Colo.; the Dominion Observatory, Ottawa, Canada, and the Meteorological Observatory at Victoria, B. C.

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### Feeble-Minded

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full articles, so that they no longer sit about vacantly and unhappily, was described before the specialists who are trying to improve the condition of this almost hopeless and helpless class of human beings.

"The mentality of an idiot girl is so simple that one seems to be baffled by the thought of teaching her," Dr. George J. Veith of Thiells, N. Y., said in addressing the American Association for the Study of Feeble-minded. "The best type of instructor understands how these girls live, and their needs. She must possess patience to a marked degree. She must be willing to get down to the level of the idiot child and to become an actual part of that child's world."

Dr. Veith reported on the difficult enterprise of training of 139 girls whose real ages range from six to 45 years, but whose minds are all below the six year level, and some even below two years. All 139 have learned the simplest practical finger tasks of buttoning and unbuttoning clothing and tying bows. Ninety-one have learned to dress and undress themselves. The attempt was made to teach 90 of them to recognize their names in print, and 82 have succeeded in learning this, so that they can pick out their own labeled clothes and possessions.

In the occupational field, 129 of the girls learned to sew carpet rags. Forty-two learned to make Persian rugs; 24 learned to knit; 29 learned to crochet; 11 can now sew on the machine; 19 can make hook rugs, and so on with other industrial tasks.

The 30 months' training has given these social and industrial misfits something to do, and it has contributed a large collection of sweaters, gloves, mats, laundry bags, toweling and other articles for the use of the institution, Dr. Veith said.

"The group plays with a better spirit," he reported, "showing a kindlier feeling to each other and to those in charge, and taking a larger interest in surroundings. Not only do these girls keep themselves looking neater but they help themselves in their cottages. They are cleaner and have come out of their world of inferiority, earnestly endeavoring to imitate the brighter girls. They are less of a burden to themselves and others."

Teaching these idiot and imbecile children to use their hands has not improved their low intelligence level, Dr. Veith reported.

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### June Skies

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and its present compound name was attached to it, it has been seen in 1869, 1875, 1886, 1892, 1898, 1909, 1915 and 1921. Some of its returns have been missed, because it has not approached close enough to the earth to be seen with the telescopes then in use.

#### The Planets in June

June also brings a better evening display of planets than we have enjoyed for many months. Most conspicuous of all is Venus which shines high in the west shortly after sunset, and is so bright that it can be seen even in the bright twilight, long before any of the other stars have appeared. As it is the brightest object in the evening sky, except for the moon, it is easily recognized. It sets below the western horizon three hours after the sun.

The other of the two planets which revolve within the orbit of the earth, Mercury, the nearest of all the members of the solar system to the sun, will also be seen for part of the month. On June 22, it will be at greatest eastern elongation, which means that it is the farthest distance east of the sun, as seen from the earth. On that day, at sunset, it will be low in the western sky, about 17 degrees, or as high as a stick 7 inches long held at arm's length, above the horizon, and a little less than that, about 15 degrees north of the point of the horizon directly west. It is too low to be shown on the maps. As the twilight lasts long at this time of year, Mercury will have set before the sky is really dark, but if one knows where to look for it, it should be picked up without difficulty in the gathering dusk. Look for it from about the 15th to the 27th.

Saturn, also, the famous ringed planet, has come into the evening sky, and is shown on the map, in the constellation of Scorpio. It is in the southeast, a little above the red star, Antares. Mars is also still in the evening sky, near Venus, but low in the west after sunset, and as it has now diminished in brightness to a par with the Pole Star, it is rather hard to see.

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In India rickets is more prevalent among high caste Hindu children who are kept indoors than among low caste children who play in the sun.

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