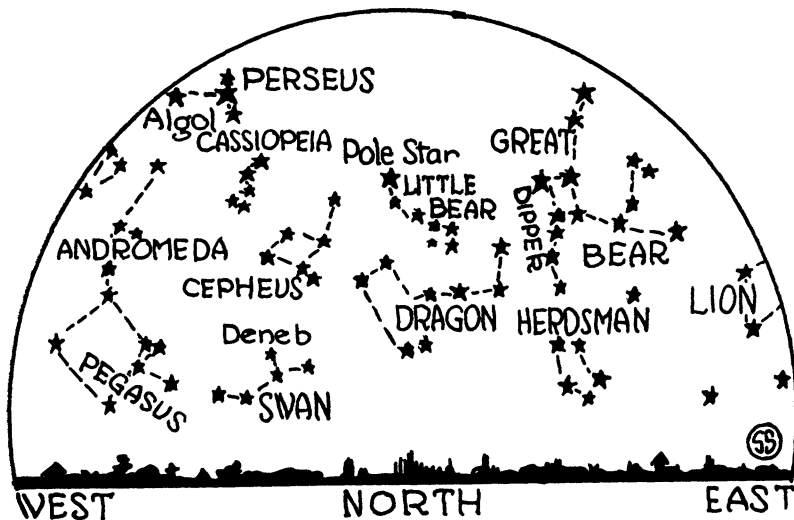


Recent Years Bring Record Comet Discoveries



By JAMES STOKLEY

One of the most remarkable things about the last two years has been the great number of comets that have visited the earth, two of which have become bright enough to be seen with the naked eye. During 1927 ten such visitors came, while in 1926 eleven were discovered. Perhaps this is due to the fact that more careful watch is being kept for them, or perhaps they are more numerous now than they have been in the past.

The most recent of these visitors was the Skjellerup comet, which an Australian amateur astronomer, J. F. Skjellerup, picked up on December 3. Though this comet did not come into the northern sky, as expected, it did become bright enough to be seen in the daytime when near the sun—unusually bright for a comet.

As several others of this flock of comets were discovered by amateur astronomers, it is evident that this is one thing that does not require the facilities of a great observatory. However, the Yerkes Observatory, of the University of Chicago, and the Observatory of the University of Heidelberg, Germany, also picked up some of these visitors. But a comet, especially a new one, may turn up at the most unexpected times. Even an old one, a periodic comet that returns again and again, may sometimes be perturbed, and come back some distance away from the place where it was expected to appear. And, again, as has happened in the past, an expected comet may fail to appear at all.

This all indicates that cometary discoveries are largely a matter of good luck.

Great Comet Chaser

One of the first of the great comet chasers was a Frenchman by the name of Messier who lived in the Eighteenth Century. It is curious that the thing for which his name is today best remembered he probably regarded as a nuisance.

Scattered throughout the sky are numerous nebulae. These appear in a telescope as faint patches of light. When a comet is first discovered, it rarely has a tail, and so it, too, looks like a faint patch of light. So much does it resemble a nebula that the only way of determining its nature is to watch it for a while. The comets are moving among the stars, but not the nebulae. So if a faint patch of light is picked up in the telescope, and it is seen to move, then the astronomer knows that he has a comet.

As the comets may be moving rather slowly, however, it would be rather annoying to an enthusiastic

comet hunter to pick up what is supposedly a new comet, and then, after many hours to find that it isn't moving, and so is a nebula after all. Messier, to save this trouble, proceeded to prepare a catalog of the most conspicuous nebulae, so that he could recognize them instantly. This was the first such catalog and so, even today, they are frequently referred to as Messier 33, or Messier 51, according to their number in his list.

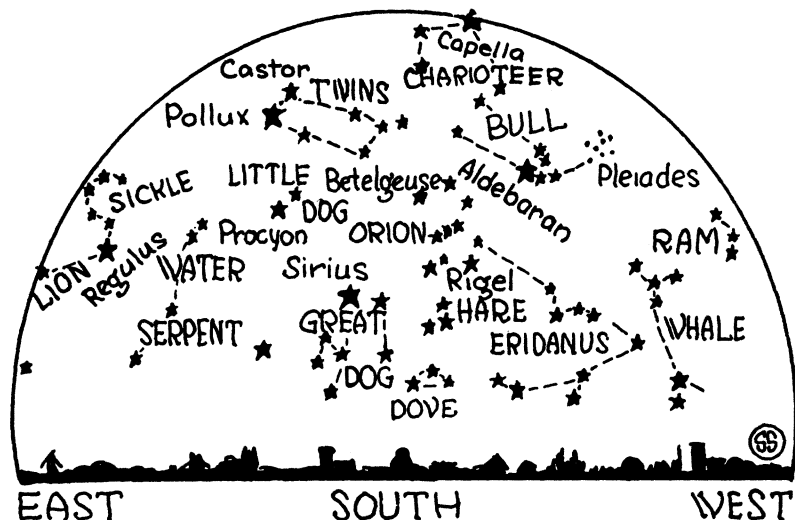
Modern Binoculars Better

Messier's telescope had a lens only two and a half inches in diameter, was only two feet long, and only magnified five diameters. A good pair of modern prism binoculars would be far superior to this instrument in every way. But with its aid he discovered thirteen comets.

An anecdote about Messier shows his devotion to his hobby. Another French astronomer, Montaigne, also went in for comet hunting, and there was a keen rivalry between the two men. After Messier had discovered twelve comets, his wife was taken sick and finally died. While attending her, another comet appeared, which was missed by him, but found by Montaigne. After his wife's death, a friend consoled with Messier about his loss. "Alas," exclaimed Messier, "Montaigne has robbed me of my thirteenth comet." Then he realized that he should be mourning his wife, and so added as an afterthought, "Ah, poor woman!"

Later, however, he did find still another comet, so that he attained his thirteenth.

(Just turn the page)



HOLD THESE MAPS IN FRONT OF YOU and face north or south. The upper or lower map then shows the February night sky as it appears to you

Record Comet Discoveries

(Continued from page 67)

One of the comets that has appeared recently bears the name of another famous amateur. The Pons-Winnecke comet, which appeared to the naked eye last summer, was first discovered by Pons, early in the nineteenth century. Pons was a doorkeeper at the Marseilles Observatory, and encouraged in his hobby by the director.

Radio Saves Comets

Just as important in keeping track of comets as modern telescopes are modern means of communication. Cable, telegraph and radio have saved many a comet from possible loss. One observation of a comet, continued for perhaps an hour or so, will reveal its cometary character. But that will not tell just how it is moving. In order to determine its orbit, three different observations, at different times, are needed. In the old days, a comet might be observed by one astronomer, and then a period of cloudy weather might ensue, during which the comet would be invisible to him. Then, when it cleared again, the comet might have moved out of sight altogether or at least to a very different part of the sky.

Now, this can hardly happen. Take the example of the Skjellerup comet for instance. On December 3, this Australian amateur found the comet. Using a special code for the purpose, he immediately cabled to the Central Astronomical Bureau at Copenhagen, Denmark, which is under the direction of Prof. Elis Stromgren. From Copenhagen the news was cabled over to the United States, as well as to observatories in Europe. It was received at the Harvard College Observatory, the American clearing house, and telegraphed to

American and Canadian observatories the day after discovery. This was in code, and looked like this:

SKJELLERUP COMET UXFI-
BADEUX FIIPDEOTDE BAAM-
BADEBA DEVYBAKUFI KUIPV-
YVYFI FIFIAMIPOT.

To the astronomer receiving this mysterious looking wire it conveys the information that Skjellerup has discovered a comet of the third magnitude on December 3.7292 (the time being given in decimal fractions of a day rather than hours, minutes and seconds), and that it was then at 16 hours 12 minutes and 12 seconds right ascension and minus 53 degrees 57 minutes declination. These are the celestial equivalents of latitude and longitude. As soon as an astronomer gets one of these wires he knows where to look for the comet, and so, as the discovery can be broadcast to the whole world in a few hours, some place is almost certain to have clear weather and to observe it.

Three Observations Needed

Then, when the necessary three observations have been made, the exact orbit can be computed, and astronomers can tell how it is moving. At many different observatories orbit computations are made. The first one to be calculated for Skjellerup was done by Dr. H. E. Wood, of the Union Observatory, at Johannesburg, South Africa. In the United States, the chief work of orbit computing is done by graduate students at the University of California, under the direction of Prof. Armin O. Leuschner.

Orbit computing is rather a complicated problem, but an expert at it can sometimes turn out one in a few hours after he has received the three positions. The method was invented by the great German astronomer, Gauss, and, curiously enough, was made to order, to keep track of a tiny planet, or asteroid. On January 1, 1801, the Italian astronomer Piazzi found Ceres, the first of these numerous bodies to be discovered. He observed it until February 11, when he was taken sick, and could no longer watch it. Then the little planet came near the sun, and so could not be seen at all. The methods of orbit computation then in use were not able to tell the orbit of the comet, so Gauss set to work to invent a new method of computing orbits, with very few positions, and to calculate the orbit of Ceres in time to find it again when it had passed the sun.

Seemingly an impossible task, Gauss actually succeeded in his problem, and he predicted the position so accurately that Ceres was again picked up in November, 1801, and has been kept track of ever since. This is essentially the same method now used for comets.

Comets "Airy Nothings"

Impressive as some of the comets become, they are really very small, in mass. In order to allay fears when one comet approached near the earth, an astronomer announced that it could be packed up in a trunk, so rarefied was it. While this is not quite literally true, it gives an idea of the nature of a comet. Though sometimes millions of miles long, the biggest are probably no more massive than a smaller example of the tiny planets. Even when the head, presumably the densest part of a comet, passes in front of a faint star, the star shines through with practically undiminished light. The tail is so imponderable that it is pushed aside by the light from the sun, and therefore always points away from it. When the comet approaches the sun, the tail is behind, when it leaves, the tail precedes.

This month of February is rather lean for striking astronomical phenomena, but the winter skies are now beginning to give way to those of spring. The map shows the stars as they appear this month. The "Sickle" of Leo, the lion, with the bright Regulus at the end of the handle, shines in the east, while Sirius, the Dog-Star, is now high in the southern sky. This is the brightest of all the stars in the sky. The Great Square of Pegasus has now moved to the west, where it will soon disappear below the horizon.

Jupiter is the only planet left in the evening sky. Even it is not visible through the entire evening, as it sets about three hours after the sun. Its brilliance in the southwest leaves no doubt as to its identity. In the early morning sky, just before daybreak, three other planets can be seen. Venus is the brightest of this trio, while nearby are Mars and Saturn.

Science News-Letter, February 4, 1928

Nearly 40 per cent. of all motor accidents occur at night, a safety expert declares.

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