

the shower of 1766 was seen in South America, and that of 1799 was the first described in semi-scientific language, by the great explorer Humboldt. We will quote the far shorter and less well-known account of our own countryman, Andrew Ellicott, then at sea:

" . . . about three o'clock a. m. I was called up to see the shooting of the stars. . . . The phenomenon was grand and awful, the whole heavens appeared as if illuminated by skyrockets, which disappeared only by the light of the sun after daybreak. The meteors which appeared at any one instant as numerous as the stars, flew in all possible directions, except from the earth to which they all inclined more or less; and some of them descended perpendicularly over the vessel we were in, so that I was in constant expectation of their falling among us. . . ."

"Nights the Stars Fell"

This shower was followed by a fine one in 1832, which for some reason had little publicity, and then the greater one on the morning of November 13, 1833, which has gone down in literature and folk-lore as "the night on which the stars fell." This display was generally visible over North America; Europe missed it by having the sun rise some hours sooner. We have accounts from the then-inhabited parts of the United States, and also from many ships at sea. It has been described so often that we need give only a few facts. Competent observers estimated that from midnight to dawn a quarter of a million meteors were visible from one place. Many were large and bright, leaving fine and long-enduring trains. Their numbers were likened to snowflakes in a snowstorm, and the display made a lasting impression on those who saw it. Naturally the ignorant, white and black, thought the Day of Judgment had come, and the night was one of untold terror to such persons, for they were sure that the end of the world was at hand. Fortunately, however, the phenomenon was also viewed by numerous men who appreciated its true nature and made observations that laid the basis of meteoric astronomy. The fundamental discovery was that the paths of the meteors seemed to radiate out from a point in the constellation Leo; hence the name Leonid.

The 1866 shower, while fine, was not comparable to that in 1833. The shower missed the earth entirely in 1899, though moderate numbers of Leonids were seen in 1898 and 1901. This failure in 1899 was a great disappointment, even though the probability that the meteor stream would (Turn to Page 297)

ASTRONOMY

Bright Stars Plentiful in the November Evening Skies

By JAMES STOKLEY

WHILE meteors are awaited in the open this month, astronomers in big observatories will be hunting for Tempel's comet. This object has exactly the same orbit as the path of the meteors and is supposed to be the source of the debris which are the meteors. It was last seen in 1866 and was found to return every 33 years.

But in 1899 it was missed, just as were the meteors. It may be found again.

Dr. A. C. D. Crommelin, a leading British authority on cometary orbits, says that when Tempel's comet crosses the plane of the earth's orbit, it will be about half a million miles nearer than it was in 1899 and a little nearer than in 1866. "There are thus," he stated, "good grounds for hope that the failure of the shower in 1899 will not be repeated."

The stars during these November evenings are beginning to assume a winter aspect. The "Great Square in Pegasus," one of whose corners is really in the adjacent constellation of Andromeda, is high in the southwest. Directly west and near the horizon is Altair in Aquila. To the north in Lyra is Vega, and above that is Cygnus with bright Deneb. This group is sometimes called the northern cross and is now vertical with Deneb at the top.

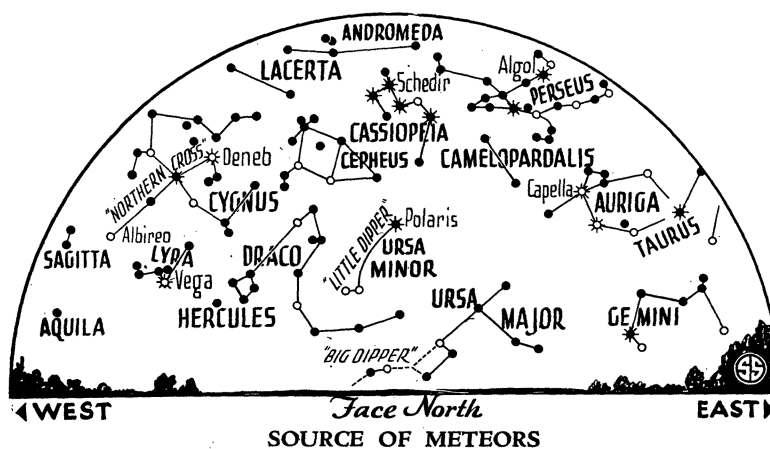
Fomalhaut can be seen low in the

southwest in Piscis Austrinus, the southern fish. Over in the east can be seen the three stars that form the belt of Orion, close to the horizon and in a vertical row. To their right is Rigel, in the same constellation and to their left is Betelgeuse. Above Orion is Taurus, with the red Aldebaran as its brightest star. To the left of Taurus is Auriga, in which is the first magnitude Capella. Thus, eight first magnitude stars can now be seen in the evening sky.

During November the moon is at first quarter on the fifth. On the thirteenth it is full, on the twenty-first at last quarter, and on the twenty-seventh it is new. Thus, during practically the entire first half of the month, the evenings will be moonlit.

On November 5, the moon occults, or passes in front of a star of the 2.9 magnitude, known as delta Capricorni. This will be visible from Washington, and can be seen with a small telescope or possibly with the naked eye, though it is rather hard to see a star of this brightness when so close to the bright moon. At Washington, in local time, it will pass behind the bright edge of the moon at 8:41 p. m. At 9:45 p. m. it will emerge from in back of the dark lunar limb. When such an occultation occurs, the star disappears and emerges instantaneously, for there is no lunar atmosphere to cause a gradual diminution in brightness.

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This map pictures the skies as they appear in the early evening. In the morning hours of days in mid-November, the constellation of Leo will occupy Gemini's position. The Leonid meteors will appear to radiate from a point in the "Sickle" of Leo.