

# Imitator of Moon Is Brilliant In August Sky

*Astronomy*

By James Stokley

THE planets Venus and Saturn, two of the most interesting members of the solar system, and the Perseid meteor shower form the chief astronomical attractions for the month of August. For a few days at the end of the month Mercury, closest of all the planets to the sun, will be seen, but with difficulty.

During the last few months Venus has been conspicuous in the western evening sky, ever increasing in brilliance. During August its brightness will continue to increase, even though it is now brighter than any of the permanent celestial objects except the sun and moon. At the end of the month it will be nearly a hundred times as bright as a first magnitude star, such as Altair, in Aquila, the eagle, which shines high in the southern sky.

Through a telescope Venus now appears of the shape of the moon just after first quarter, that is, gibbous. But very little else of interest can be seen on the planet, even with the best of telescopes.

## Galileo Discovered Imitation

It was in 1610 that the Italian astronomer Galileo, first to use a telescope, saw Venus other than with the unaided eye. His discovery that "the mother of loves (Venus) imitates the phases of Cynthia (the moon)," as he expressed it, was one of the most important of the many that were made by this great pioneer observer. This discovery played an important part in establishing the then novel theory of Copernicus, that the earth, along with the other planets, revolved around the sun.

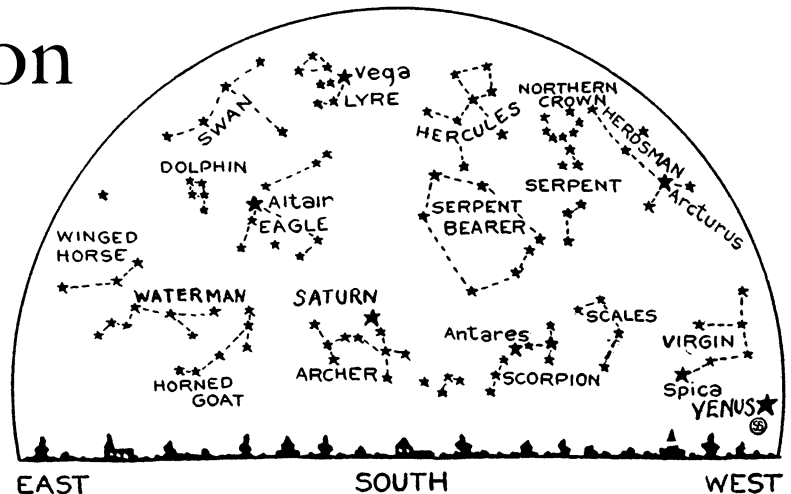
Nicolas Copernicus was a Polish astronomer whose main job was an ecclesiastical one. Though he never actually took holy orders, becoming a priest, he was canon of the Cathe-

dral at Frauenburg. The first publication of his theory was in a little book by his disciple, Georg Joachim Rheticus. This was the "Narratio Prima," published first at Danzig in 1540 and reissued the following year at Basle. Copernicus' own work, "De Revolutionibus Orbium Coelestium" ("On the Revolutions of the Celestial Orbs") was published at Nuremberg in 1543. But he never lived to see the effect it would have on the world. The first copy was put in his hands as he lay in his death bed.

All these books are now excessively rare and fortunate is the library that possesses a copy of any of them. Even the second edition of "De Revolutionibus," at Basle in 1566, is almost as rare as the first, while also of great rarity is the third, published at Amsterdam in 1617. Strangely enough no English translation has ever been published, though this will probably be rectified in the near future after the lapse of nearly four centuries. The History of Science Society has in its custody a translation made by an Englishman and expects to publish it shortly.

## Venus and Her Phases

Copernicus' ideas were opposed by the church, which objected to the earth and man being dethroned from the center of the universe. His theory was not really new, as it had been proposed by the Greek astronomer Aristarchus of Samos many centuries earlier. But the accepted theory during and after Copernicus' lifetime was that associated with the name of Ptolemy. According to it, the earth was at the center, and the sun, moon and the five known planets revolved around it.



Hanging low in the west, Venus, who imitates the phases of Cynthia, will soon invite observation by becoming 100 times brighter than a first magnitude star.

Venus, by the Ptolemaic theory, revolved in an orbit within that of the sun. As it was never seen far from the sun, this meant that if it were round, and illuminated by the sun, the latter, always being back of it, would never shine on all of its surface that we see. In other words, if it showed any phases, it would always be a crescent. It could never, according to the Ptolemaic theory, get beyond the sun and show a gibbous or full phase.

Shortly after he began using his telescope in 1610 Galileo found that Venus showed all the phases observed in the moon, from the crescent to full and back to crescent again. This showed that Venus revolved around the sun and not around the earth, and was a serious blow to the generally accepted ideas of his time. But he had to be cautious about announcing it. It was such a radical discovery that he first announced it to his friend, Johann Kepler, in the following anagram:

## His Cautious Announcement

"Haec immatura, a me, jam frustra, leguntur. —oy."

This is necessarily rather garbled Latin, but can be translated as "These things not ripe at present in vain are read by me." This does not mean very much, but the letters can be transposed to read:

"Cynthiae figuras aemulatur Mater Amorum."

Translated, this is the phrase

quoted above, "The mother of loves imitates the phases of Cynthia."

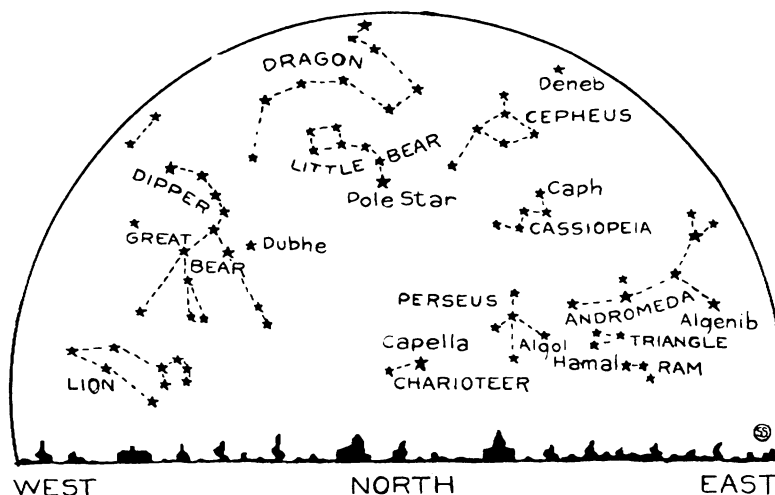
Even this discovery did not lead to the immediate acceptance of the views of Copernicus, so firmly were the older ideas entrenched. In fact, Galileo himself was later forced by the Inquisition to recant, and to say that he did not believe that the earth moved. But his ideas remained, and finally led to a true knowledge of how the solar system is put together.

### Saturn Also Visible to Eye

Saturn, the other naked eye planet in the August evening skies, is to be seen in the south. At sunset in the middle of the month it is about 20 to 25 degrees above the southern horizon, in the constellation of Sagittarius, the archer. Its steady yellowish light, brighter than any of the surrounding stars, makes it easy to locate. Mercury, the innermost of the planets, reaches its greatest distance to the east of the sun on the twenty-sixth, and then it sets about an hour after the sun. To the keen eye about this time it may be perceived low in the gathering evening dusk, but it will be rather hard to locate.

The Perseid meteors this month are at their height on the nights of August 10 and 11. They were described in detail in the last issue of the SCIENCE NEWS-LETTER by Dr. Charles P. Olivier.

Five first magnitude stars are visible these August evenings. Almost directly overhead is Vega, in Lyra, the lyre. A short distance to



How the observer will find the Northern sky in August. Observation will be better during the latter part of the month after the moon begins to wane.

the east, at the head of the familiar Northern Cross, or Cygnus, the swan, is Deneb. To the south is Altair, in Aquila, the eagle. Low in the southwest is Scorpio, the scorpion, with the ruddy Antares. Capella, in Bootes, is almost directly west.

Appropriately enough, the moon is in first quarter on the first and full on the tenth. Therefore, bright moonlight evenings will be the rule during the first half of August. On the seventeenth it is in last quarter, and is new on the twenty-third, so that it has time to come again to first quarter on the thirtieth.

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lyzed by Mr. Lane are: Long sentences, especially those imposed by recent legislation; elimination, or reduction, of "good conduct" time; fewer paroles; extraordinary and growing overcrowding; and idleness.

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### Artificial Encouragement

IMITATION sunlight, shining through fake windows, aids and encourages belated clerks to turn out better work than they are able to do under the artificial stare of ordinary vacuum or gas-filled lamps, experiments conducted recently by the National Physical Laboratory in London indicate.

Eyes are older than electric lights and hence are more at home under conditions approximating natural daylight than with light supplied from globes, was the theory argued by advocates of the new system. It was first tested in the laboratory and then tried in offices.

A comparison of the hourly work output of clerks working in simulated daylight with their efficiency under ordinary artificial lighting conditions showed a balance in favor of imitation daylight. Coloring of the light to approximate the sun's rays was found to be the most essential condition for efficiency, though the distribution of the light through a window-like aperture was also discovered preferable to illumination from semi-indirect bowls suspended from the ceiling.

*Physics*

*Science News-Letter, August 9, 1930*

## More Prison Outbreaks Predicted

*Penology*

FURTHER prison outbreaks like the one which occurred recently in the Ohio Penitentiary, Columbus, where 322 prisoners were burned to death, and those at New York State Prison, Auburn, are predicted by Winthrop D. Lane, secretary of the advisory committee on penal institutions, probation and parole of the National Commission on Law Observance and Enforcement, in a statement published in the current issue of the *Survey Graphic*.

Mr. Lane predicts that the next outbreak will occur in one of the following institutions: New York State Prison, Auburn; Ohio Penitentiary, Columbus; State Prison, Folsom, California; State Reformatory,

Mansfield, Ohio; State Penitentiary, Lansing, Kansas; West Virginia Penitentiary, Moundsville; Missouri Penitentiary, Jefferson City; New York State Prison, Dannemora; Washington State Penitentiary, Walla Walla; State House of Correction and Branch Prison, Marquette, Mich.; Maryland Penitentiary, Baltimore; and the two United States civil penitentiaries at Atlanta and Leavenworth.

"Not only do conditions tending to provoke outbreaks still exist," said Mr. Lane, "but some of these conditions are worse than they were when the outbreaks of the past year occurred."

The causes of prison riots, as ana-

If it were not for the earth's atmosphere, with its clouds and water vapor, the sun would raise the temperature at the earth's surface about 50 degrees higher than it is.