Hypatia of Alexandria

The first woman mathematician we know about in any detail is **Hypatia of Alexandria** (A.D. 370–415). She learned mathematics from her father, **Theon**, a writer credited with keeping the spirit of Greek mathematics alive during a time when Christian zealots considered mathematics and science to be heresy. Although it was unusual for women of early Greece to receive an education, Hypatia became a highly respected teacher, writer, astronomer, and scientist.

Most of Hypatia's original work has been lost, but it is referred to in numerous texts. During Hypatia's time, teachers often supplied instructional materials to their students by writing commentaries on the pages of already existing scholarly works. In the process, these teachers contributed new material to their fields of study. It is believed that Hypatia authored substantial commentaries on such works as Apollonius' *Conics*, Diophantus' *Arithmetica*, Ptolemy's *Almagest*, and Archimedes' *Measurement of the Circle*. Considered charismatic, knowledgeable, and versatile, she was a popular teacher, in part because she explained complex mathematical ideas clearly and precisely. Reportedly, her eloquent lectures drew scholars from Africa, Asia, and Europe.

An interest in mechanics and the practical applications of mathematics served Hypatia in her roles as astronomer and scientist. It is through correspondence between her and one of her students that we know of her designs for an astrolabe, a tool that determines the altitudes of the stars and the planets. Additionally, she developed the concepts and construction ideas for other scientific devices such as the hydroscope, an instrument used for viewing objects far below the surface of water.

Because her devotion to education and learning countered the Roman Empire's Christian doctrines, Hypatia became a focal point in the political tensions between Christians and non-Christians in Alexandria. Her Neoplatonic views, which were based on the philosophies of such non-Christians as Plato and Aristotle, prompted a mob of zealous Christian monks to murder her in March, A.D. 415. ★

Idealized portrait of Hypatia.

This sixteenth-century woodcut by Hans Holbein II depicts two astronomers observing the phases of the moon. The astronomer on the left holds dividers on a celestial sphere, while the astronomer on the right makes measurements with an astrolabe and a backstaff.

Activities

1. Provide some details on the hydroscope and the astrolabe.

2. Discuss this statement made by Theon to Hypatia: "Reserve your right to think, for even to think wrongly is better than not to think at all."

3. Research the role of women in early Greek society. How did this role compare with that of women in early Egyptian society?

4. How did Hypatia's scientific views and methods conflict with the dominant Christian religion of Alexandria? How were these conflicts magnified when **Cyril** became archbishop of the Alexandrian Church in A.D. 412?

5. Why is the death of Hypatia considered by some to mark the end of the Greek mathematical tradition in Alexandria?

Related Reading

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