Separating Fact from Fiction:
Exploring the life and works of Hypatia of Alexandria through a first-hand account

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MATH 3015
History of Mathematics
Greek Mathematicians
Assessment 1
Hypatia of Alexandria is regarded as the first woman mathematician of whom we have knowledge (Richeson). Born sometime between 350-370 A.D. (M. Deakin), she was the daughter of Theon, the last director of the famous Museum of Alexandria, which was founded by the general Ptolemy of Alexandria in 306 B.C. (Alic). The Museum, more comparable to today’s universities and research centers than a collection of historical artifacts, was the epicenter of knowledge in this Hellenistic city on the northern coast of Egypt. Famous scientists such as Euclid, Eratosthenes, Apollonius, Hipparchus, and Archimedes all worked at the Museum, thus contributing to its success and fame (Johnson). These predecessors of scientific research made fertile the ground of intellectual breakthroughs and foundational discoveries in mathematics. Hereafter lies the story of Hypatia.

When studying historical figures or texts, Benjamin Wardhaugh addresses in his book *How to Read Historical Mathematics* that sources can be categorized three ways: primary, secondary, or tertiary. Unfortunately, all the work and writings by Hypatia have been lost in the memory of time, save some titles and references preserved by secondary sources (Robertson and O'Connor). Due to political and religious fractions surrounding her story and the mystery surrounding the gaps we cannot fill in, Hypatia has been the subject of fiction throughout the years. Two books were printed in the 1700’s claiming to be historical accounts of her life (Lewis), (Toland). Around the turn of the twentieth century, Elbert Hubbard included a “biography” of Hypatia in his collection of *Little Journeys to the Homes of Great Teachers*. Her life even was dramatized in the 2009 film *Agora*. These accounts, along with those more factual, provide the intrigued student with a wealth of resources to commence study into the character of Hypatia. Yet the true aim of a researcher or historian should be to isolate fact from fiction. In an attempt to achieve this separation, I chose to closely examine the only sources we have from an individual who gives a first-hand account of the life and works of Hypatia, Synesius of Cyrene.

Synesius was one of Hypatia’s most well-known students. He studied under Hypatia in Alexandria and continued correspondence with her after he left (Robertson and O’Connor). These letters, preserved in a compilation known as the *Patrologiae Graecae* (M. A. Deakin), give us the only third-person account of Hypatia from a person her contemporary. Synesius later became the Bishop of Ptolemais and from his letters, we can observe that he held Hypatia in high regards and admiration (Robertson and O’Connor). The letters, written over a span of nineteen years, are always addressed “To the Philosopher [Hypatia]” (Synesius of Cyrene). His first letter is incomplete.
and gives us no details into the life of Hypatia, besides the fact that he recommends to her a certain gentleman named Alexander (33). The rest of the letters prove to be more insightful.

Letter 124, written circa 401 or 411, first reveals Synesius’ admiration for his teacher. In opening, he quotes a sentimental line from Homer’s *Iliad* and references her as “dear Hypatia.” He goes on to give an account of the turbulent circumstances that currently surround his city, then again professes his admiration by stating that it would be “on your [Hypati’s] account alone” that he would able to leave his beloved home. Such sentiments would cause one to think that perhaps Synesius and Hypatia had more than a student-teacher relationship. However, later letters reveal that he had a wife and children whom he adored—and grieved greatly for after their death (81) — and no other sources indicate such a relationship between them. Therefore, one must conclude that Hypatia was so well-respected by her student that he held her in the highest regard.

Synesius’ next letter, depending on the dating of the previous, reveals more about Hypatia’s work in science (15). Synesius asks that Hypatia build him a hydroscope and then goes on to explain its shape, construction, and use. The description is detailed, but Synesius seems to also assume that Hypatia has more than just rudimentary knowledge of mechanics. Therefore, one can suppose that Hypatia had the ability to cast and build such an instrument, or at least knew enough to supervise its construction by another. This is also the first description found of what we now call a hydrometer, an instrument used to measure the density of water (Synesius of Cyrene). Some sources take this information to mean that Hypatia invented the hydroscope (Weissmann), which gives credence to the idea that she may have also invented the astrolabe. Synesius himself wrote a letter to Pylaemenes claiming that Hypatia had indeed invented the astrolabe. Astrolabes were used by astronomers as a way to measure time based upon the position of celestial bodies relative to ones position on earth (Morrison). A typical astrolabe included three parts: the rete, plate, and mater. The rete pointed to the locations of stars, the plate contained a stereographic projection of the visible celestial sphere, and the mater housed the rete and plate while also storing additional information on the back. By selecting a star, one would then sight the altitude, identify the star on the plate, set the altitude, then use a rule to find the time given you know the date (Wujec). It is thought that the first astrolabe was invented before 400 A.D., but who exactly invented the instrument is unknown (Morrison).

Letter 81 accounts Synesius’ grief over the loss of his son and he says, of Hypatia, “I account you as the only good thing that remains inviolate, along with virtue” (Synesius of Cyrene). Synesius next mentions something new, although given the dramatized state of his grief, its meaning is
debateable. He says, again of Hypatia, “You always have power, and long may you have it and make good of use of that power.” It is possible that Synesius was indicating that Hypatia sat in a position of power in Alexandria, as some have supposed (M. A. Deakin). His next mention supports this idea that Hypatia was in a position of influence. Synesius recommends two individuals, Nicaeus and Philolaus, to Hypatia and asks that she rally for their support among her friends, “whether private individuals or magistrates.” Other sources have suggested that Hypatia was in close relations with Orestes, prefect of Alexandria, which lead to her death by the jealous hands of Cyril, bishop of Alexandria (Rist). This may have been the magistrate that Cyril was referring to, but again his omission of details can only lead to speculation.

The last two letters (10 & 16) show a possible change in the relationship between Synesius and Hypatia. Letter 10 suggests that neither Hypatia nor his other friends have taken the time to return his letters recently, a gesture he seems to be somewhat offended by but nevertheless he continues to write. In the midst of his sorrows, Synesius renews his sentiments by “rejoicing in your [Hypatia’s] happiness” and claiming that “the greatest loss of all, however, is the absence of your divine spirit” (Synesius of Cyrene). His last letter, written from his bed, asks that Hypatia give his salutations to others in Alexandria, hinting that he foresees his coming death. Synesius’ continued praise of Hypatia leaves the lasting impression that she had a great influence upon his life. While writing books and finding new discoveries may be the aspirations of many scientists, it is the reputation they leave behind also contributes to their view in history. Through the letters of Synesius, one can conclude that Hypatia left behind a reputation of respect not only for her scientific work, but also her character.

Looking only at the accounts given by one person may not give a complete picture of the life and works of Hypatia. There are other historical references such as the writings by Socrates the church historian, Damascius a philosopher in Athens, and the bishop John of Nikiu. Socrates lived during the time of Hypatia, although we are not aware that they made contact. His account of Hypatia’s death by the hand of a mob in 415 A.D. (Scholasticus) may be the most accurate account we have, given it was written around twenty-five years after her death (M. Deakin). Damascius’ account was preserved by the Suda, an ancient encyclopedia (Whitfield), and gives us the only reference to her works—commentaries on Diophantus, The Astronomical Canon, and The Conics of Appolonius. John’s account seems to heavily influenced by religious opinions, but also gives us a glimpse into the turmoil that surrounded Hypatia in Alexandria (John). While these accounts may be considered primary or secondary sources with valuable information into the life and works of
Hypatia, none of them had the personal relationship with Hypatia like Synesius. It may be impossible to completely separate fact from fiction, but removing the cloudy memory of time and dusty lens of perspective is a start.
Works Cited


