

Women Scientists of the Middle Ages & 1600s

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Until the women's movements of the 1800s and 1900s, the limitations set by society for women in the West hardly evolved since the Middle Ages. It is well known that most women in the Middle Ages were restricted in their roles as citizens, limited by social status, by economic constraints, and by a well-established and unquestioned sexism prevalent in church, politics, and family. A woman was defined, especially during the Middle Ages, by how the men with whom she associated defined her. These men were most often her husband or her father. As Christaine Klapisch-Zuber points out in *Medieval Callings*, "Men of the middle ages long conceived of 'the woman' as a category, but only late in the period did they distinguish variations in the behavior expected of women by applying criteria such as professional activities to their model. Before she was seen as a peasant, the lady of a castle, or a saint, 'the woman' was defined by her body, her gender, and her relations with family groups. Wife, widow, or maid, her juridical persona and the ethic by which she lived in her daily life were portrayed in relation to a man or group of man" (285).

By this standard, the average Medieval woman had as much chance of acquiring independent wealth, receiving a well-rounded education, or making significant contributions to society as her husband's cattle. Therefore, it is all the more remarkable that history yields to us several outstanding women of the Middle Ages and 1600s whose accomplishments in the fields of science and writing are still recognized today as valid and significant.

The status of the woman living in the Middle Ages broadened only by necessity. Many men needed the help of their wives to sustain the family, and so men began bringing their wives into the same trade guilds of which the men were already members. Women in these guilds were expected to learn their husbands' trades and, in many cases, were given "masters status" in these trades. (Gies 180). In the event of her husband's death, the widow was able to take an apprentice herself. The natural evolution of allowing wives into guilds was the emergence of all-female guilds, which usually catered to women in the tapestry and candle trades.

Aside from marginal work in the guilds, women usually did not receive formal training; the work they did involved transferring skills learned within their families (Hanawalt 116). It is the opening of this door—teaching women a trade by economic necessity—that paved the way for other kinds of shared knowledge. Of the notable female scientists and writers of the Middle Ages and onward, most were indebted to husbands and fathers for their educations, outlets, and resources. The way that women received their education would not change for several centuries and would not change dramatically until the 20th Century. Among those discussed here are select women who lived and worked between the Middle Ages and the 1600s and whose scientific discoveries and writing had a lasting effect on the course of science.

Trotula Plataerius



It is thought that Trotula Plataerius (Trotula of Salerno) worked in the 11th Century and was the wife of Johannes Plataerius, a physician working in Italy. It is most likely through him that she was provided the opportunity to teach and practice medicine. With the medical field entirely dominated by men during the Middle Ages, it is not surprising that little headway was made in the fields of gynecology or obstetrics. Recognizing the need for specialized medicine in these areas, Trotula became a

leading Italian physician in not only gynecology and obstetrics, but also in dermatology and epilepsy. Already having taken a great step by becoming a practicing physician, Trotula broke tradition by revolutionizing the way that diseases were diagnosed. Her unique methods of questioning the patient in addition to close observation were unheard of in the Middle Ages. Unlike most of the few female physicians of this era, Trotula was highly respected, especially by her students at Salerno's medical school, and was considered the most knowledgeable teacher at the school. Among her students was Rudolph Malecouronne, who became the most important physician in Western France.

In addition to her groundbreaking work in women's health issues and her stylized method for diagnoses, Trotula contributed to the medical world a substantial body of written work, the most influential being *Passionibus Mulierum Curandorum* (*The Diseases of Women*), which is also referred to as Trotula Major. This book was intended to enlighten the male-dominated medical world concerning the female body and suffering. *The Diseases of Women* is comprised of sixty-three chapters that outline menstruation, general diseases and treatments, and pregnancy from conception to childbirth. Her suggestion that opiates be provided to women during childbirth was in direct defiance of the Church's teachings. Her claim that the physiological defects of both women and men could affect conception was a dangerous one to make during the Middle Ages, since it implied that men could be responsible for infertility. Because of her extensive work and its influence, a few scholars have asserted that Trotula did not exist, and that if she did exist, she could not possibly have been a woman—an argument that will not be entertained in this paper.

Christine de Pisan

Although Christine de Pisan is not considered a scientist, she was learned in many fields, including an array of sciences. Her most famous book, *The Book of the City of Ladies* is a compilation of biographies that outline the lives of notable women before and during de Pisan's life, describing their contributions to history and culture.

The success of Christine de Pisan in an era when women held no legal rights can be attributed to her status, or more directly, her father's status. Christine was the daughter of a well-educated physician who graduated from the University of Bologna, where he later delivered astrology lectures.

During the Medieval Period, the study of constellations was believed to be correlated to

medicine. In 1357, Christine's father moved to Venice, and she was born the following decade. When Christine was nearly five, her father took an appointment as royal astrologer to Charles V, and then moved the entire family to Paris.

Christine's success is most certainly attributed to her father, who allowed Christine to receive an education comparable to boys her age. Her mother, on the other hand, was disapproving of this education, citing that to go to school like boys was "unladylike." Paris was the perfect place to receive a broad and well-rounded education. Christine studied classical languages, history, literature, and religion.

At age fifteen, Christine married the twenty-five-year-old Etienne de Castel, a graduate of the University of Paris. Etienne was made a royal secretary of the court, a lifetime position that catapulted him to status of "intellectual elite," and as his wife, Christine benefited from that status.

Ten years later, Christine's father would be dead, one of her children would be dead, and she would be widowed. From these tragedies grew the intense desire to write, for she was now economically responsible for her children, her mother, and one niece. She later expressed in her book, *The Mutation of Fortune*, that, in a sense, she had to become a man so that she could take on the responsibilities of a man in a man's world. Christine passed through the same door opened by guild widows: economic necessity leading to an otherwise nonexistent opportunity. She was, by all accounts, France's first professional woman writer.

Hildegard of Bingen

For one woman, conventional boundaries hindering women's education did not apply. Hildegard of Bingen, who was born into a noble family, and who as an adult was consulted by bishops, popes, and kings, was set on a different path as a direct result of seeing visions that began at age three. Recognized for these visions, Hildegard began a religious education at age eight and went to live with and be taught by an anchoress named Jutta. Jutta died when Hildegard was thirty-eight. At that time, she was elected head of a beginning convent located at the anchorage where Jutta had lived. In these years, Hildegard had her most intense visions which gave her instant understanding of the meaning of religious texts. In these visions, God commanded her to write down everything she observed in them. When Pope Eugenius asked to see her writings, her fame mounted and spread through Germany. These writings opened opportunities for a lifetime of writing, during which Hildegard published books with subjects including theology, natural history, curative powers, and philosophy. Her scientific views were rooted in ancient Greek cosmology, which is reflected in her scientific writings.

Sophia Brahe/Marie Cunitz

Sixteenth century Danish astronomer Sophia Brahe started out as her brother's assistant. She and her brother, Tycho Brahe, who hired Johannes Kepler as an assistant, recorded accurate positions of the planets in the sky in the late 1500s. Kepler compiled a catalog of the Brahe's planetary measurements, which was considered to be the most accurate set of uniform data on the positions of the planets relative to the reference background of stars as a function of time. As

Tycho surrounded himself with knowledgeable scientists, Sophia benefited, learning all she could and contributing knowledge that had a lasting impact on modern astronomy.

Although Sophia was instrumental in collecting data and making astute observations, it is her brother who is continually credited with their work and who is the subject of numerous books and namesake of the greatest planetarium in Denmark.



After Kepler published his theories based on the findings of the Brahes, his works were translated by Marie Cunitz, who was born in 1610. Her translations became so widely respected that she was deemed “Urania Propitia,” meaning, “she who is closest to the muse of astronomy.” It was by Cunitz’s translations alone that many scholars of her time gained access to Kepler’s works.

Margaret Lucas Cavendish

Margaret Lucas Cavendish is credited with both scientific writing and the publication of poetry. Margaret had been abnormally shy as a young girl and did not fare well socially. She was, however, beautiful and attracted the attention of William Cavendish, Marquis of Newcastle. William was 30 years Margaret’s senior and suffered the reputation of being a womanizer. Fortunately for Margaret, her husband was not only rich but well known by royalty and nobility. He and his brother were patrons of the arts and sciences; the latter had held Margaret’s interest since childhood, though she was never educated in the sciences. It was not Margaret’s husband who helped her pursue her interests in math and science, but her brother-in-law, Sir Charles Cavendish. By forming an intellectual alliance with Charles, Margaret Cavendish was allowed to visit and hold discussions with such great minds as Thomas Hobbes, René Descartes, and Marin Mersenne. In 1652, she pursued scientific writing.

Between 1653 and 1671, Margaret published fourteen books about atoms, matter and motion, butterflies, fleas, magnifying glasses, distant worlds, and infinity. She also wrote poems, plays, philosophies, orations, and discourses (Woolf 69). Although Margaret earned moderate admiration as a writer, she never bloomed socially and was constantly criticized as being eccentric and odd. When she became the first woman invited to a Royal Society meeting, she made a terrible impression by not speaking, looking downward, and wearing a garish dress with a train so long it had to be carried in by six maids. She had not been invited to the Society meeting because of her writings, but more likely because of the pull her husband and his brother had in that circle. Prior to the decision to let Margaret Cavendish visit, the Royal Society had been divided over the idea, debating whether or not it was conducive to the group’s goals to admit any woman for so much as a visit. When Margaret’s visit proved disastrous, the Royal Society decided their decision to allow a woman to visit had been too risky. No other women would be invited to a Royal Society meeting for three hundred more years.

Maria Kirch

Near the end of Margaret Cavendish’s publishing career was born Maria Kirch, a German

housewife with an interest in astronomy. It is believed Maria was introduced to the study of astronomy by Christoph Arnold of Summerfield, who has been called the “astronomical peasant.” Christoph had been self-taught, but was so impressive that the council of Leipzig, where he lived, granted him both money and freedom from taxes for life.

Her interest was then encouraged by her husband, Gottfried, whom she married at the age of twenty-two. Gottfried was an astronomer; he and Maria worked together until his death in 1710. Together, they made observations and formed calculations based on their studies. She was associated with the Berlin Academy through her husband, but was denied membership because she was a woman. After Gottfried’s death, Maria knew that she did not have a chance at being a woman working as astronomer, so she worked in a laboratory belonging to Baron von Krosigk writing and expanding on her observations. When the Baron died, Maria was invited by Peter the Great to visit Russia, but Maria moved back to Leipzig where she knew she could continue her scientific work without hindrance. In Leipzig, she worked with her son, who by then had made a name for himself in astronomy by working as astronomer at the Berlin Academy. They both worked calculating calendars until her death .

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Biographical Sketch

Alana Merritt Mahaffey earned her B.A. in English (cum laude) from the University of Central Arkansas in 1996 and will receive her M.L.A. from Henderson State University in May 2001. She has been editor of *Sheriff and Deputy* magazine, and is founder and editor of the *Arkansas Inmate Collective*. In 1997 she received the Mark of Excellence Award from the Society of Professional Journalists for editorial writing. Currently she is the president of the Arkansas Literary Society (WORDS) and associate ed

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