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The Scientific Revolution – Document Packet #3

Document 1

Since the beginning of time, women have played a vital role in the understanding of scientific processes. It is scientific women through out the centuries that have shaped our understanding of scientific technology. Approximately half of the human race, being women, has been important to the development of religion, agriculture and medicine. Even though the one way for women scientists to make it into other fields was through the scientific field of botany. A common theme I noticed in my research is that the historians were beginning to acknowledge that women were capable of doing more than gender defined activities, such as domestic duties and child rearing. Another similarity among these scientific women was that they each had published an important or famous work.

For four thousand years, women have worked side by side with the men in their great quest for scientific knowledge and recognition. For example, these women of the past should be included in the discussion of the present and the future. The strength of this arguement depends on recognition of women such as Maria Agnesi, Laura Bassi, Caroline Herschel, Mary Winkelmann Kirch, and Emilie du Chatelet.

Maria Agnesi was a child prodigy who mastered Latin, Hebrew, and Greek by the age of nine. She is by far the most important and extraordinary figure in mathematics during the eighteenth century. She earned the chair for mathematics early in her lifetime. Her most important work Analytical Institutions, was meant only for her brother's use, however, ended up being the most clarified authority on the subject of calculus.

Laura Bassi earned a degree, a lectureship, and a membership into the academy in Italy because of her extensive work in the subject of physics. She made use of the rewards and carved out a position for herself in the scientific community of Bologna in Italy. She also strived to become the head chair-person of Physics there as well. A great honor for this extraordinary female of science. Another fascinating woman was Caroline Herschel. She was honored in every corner of the European continent. One of her landmark achievements was that she became the first woman recognized for her scientific contributions by a king. Her importance to the field of astronomy was that she was the first woman to catalog the existence of nebulae. Despite her mathematical deficiencies, she was a able perform advanced calculations and publish the results. Another big break through was when she discovered a comet. Another prestigious woman scientist to accomplish this feat was Mary Winkelmann Kirch. She accomplished this feat in 1702.

The final prominent woman scientist that will be discussed is Emilie du Chatelet. Like other mathematicians of this time she was a truly unique woman scholar and used her own algebraic formulas and commentaries in her studies. Her most famous work is Institutions de Physique. She also translated Newton's book, Principia, into the French language for her community. Her contributions have helped shape the course of mathematics.

During the seventeenth and eighteenth centuries a number of women have contributed enormously to

the field of astronomy, mathematics, and physics. It is only now that these women are gaining the respect and notoriety that they deserve. If it was not for these scientific women there would not be college courses devoted to the study of these women in science.

SECONDARY SOURCE: "Women in Early European Science," Melanie Filiziani, Kings College, 1998. Found at: <http://www.kings.edu/womens_history/emscience.html>

Document 2

The Hague, 20 June 1643

Monsieur Descartes,

...The Life I am forced to lead does not leave me the disposition of enough time to acquire a habit of meditation according to your rules. So many interests of my family that I must not neglect, so many interviews and civilities that I cannot avoid, batter my weak spirit with such anger and boredom that it is rendered for a long time afterward useless for anything else. All of which will excuse my stupidity, I hope, not to have been able to understand the idea by which we must judge how the soul (not extended and immaterial) can move the body by an idea we have in another regard of heaviness, nor why a power—which we have falsely attributed to things under the name of a quality—of carrying a body toward the center of the Earth when the demonstration of a contrary truth (which you promised in your Physics) confirms us in thinking it impossible. The idea of a separate independent quality of heaviness—given that we are not able to pretend to the perfection and objective reality of God—could be made up out of ignorance of that which truly propels bodies towards the center of the Earth. Because no material cause represents itself to the senses, one attributes heaviness to matter's contrary, the immaterial, which nevertheless I would never be able to conceive but as a negation of matter and which could have no communication with matter.

I confess that it is easier for me to concede the matter and the extension of the soul than to concede that a being that is immaterial has the capacity to move a body and to be moved by it. For if the former is done by giving information, it is necessary that the spirits which make the movement be intelligent, which you do not accord to anything corporal. And although, in your meditations, you show the possibility of the soul being moved by the body, it is nevertheless very difficult to comprehend how a soul, as you have describe it, after having had the faculty and habit of good reasoning, would lose all that by some sort of vapors, or that being able to subsist without the body and having nothing in common with it, would allow itself to be so ruled by the body.

SOURCE: Elisabeth of Bohemia's letter challengeing Descartes, 1643.

Document 3

Art has intoxicated so many men's brains, and wholly imployed their thoughts and bodily actions about phaenomena, or the exterior figure of objects, as all better Arts and Studies are laid aside; . . . But though there be numerous Books written of the wonder of these [experimental optical] Glasses, yet I cannot perceive any such; at best, they are but superficial wonders, as I may call them. But could Experimental Philosophers find out more beneficial Arts then our Fore-fathers have done, either for the better increase of Vegetables and brute Animals to nourish our bodies, or better and commodious contrivances in the Art of Architecture to build us houses, or for the advancing of trade and traffick. . . it would not only be worth their labour, but of as much praise as could be given to them: But, as Boys that play with watry Bubbles . . . are worthy of reproof rather than praise, for wasting their time with useless sports; so those that addict themselves to unprofitable Arts, spend more time than they reap benefit thereby.

SOURCE: Margaret Cavendish, *Observations Upon Experimental Philosophy*, 1666.

Document 4

In the sixteenth and seventeenth centuries Europe's learned men questioned, altered, and dismissed some of the most hallowed precepts of Europe's inherited wisdom. The intellectual upheaval of the Scientific Revolution caused them to examine and describe anew the nature of the universe and its forces, the nature of the human body and its functions. Men used telescopes and rejected the traditional insistence on the smooth surface of the moon. Galileo, Leibnitz, and Newton studied and charted the movement of the planets, discovered gravity and the true relationship between the earth and the sun. Fallopio dissected the human body, Harvey discovered the circulation of the blood, and Leeuwenhoek found spermatozoa with his microscope.

For women, however, there was no Scientific Revolution. When men studied female anatomy, when they spoke of female physiology, of women's reproductive organs, of the female role in procreation, they ceased to be scientific. They suspended reason and did not accept the evidence of their senses. Tradition, prejudice, and imagination, not scientific observation, governed their conclusions about women. The writings of the classical authors like Aristotle and Galen continued to carry the same authority as they had when first written, long after they had been discarded in other areas. Men spoke in the name of the new "science" but mouthed words and phrases from the old misogyny. In the name of "science" they gave a supposed physiological basis to the traditional views of women's nature, function, and role. Science affirmed what men had always known, what custom, law, and religion had postulated and justified. With the authority of their "objective," "rational" inquiry they restated ancient premises and arrived at the same traditional conclusions: the innate superiority of the male and the justifiable subordination of the female.

SECONDARY SOURCE: Excerpts from *A History of Their Own, vol. II*, by Bonnie Anderson and Judith Zinsser. HarperCollins Publishers (New York: 1988)..