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Is Equality Secular? Women, Science, and Secularism

Conflicts between science and religion are often rooted in ideas of secularity – a term that has come to denote *opposition* to systems of belief. Its use functions under that Enlightenment presumption that the truth emerges “only with the shedding of religious authority or prejudice.”¹ Thus, what undermines the authority of religion must be secular, and therefore science is often conflated with the secular. As it goes, if the true contention lay in claims to societal authority, then science as a secular force should exist in opposition to religion (as does the secular).

However, as regards the titular question, we see that for all their opposition, both religious and secular intellectual traditions have continuously articulated and contributed to gender disparity. In his *Observations on the Feeling of the Beautiful and Sublime*, Immanuel Kant claimed that those characteristics required for prolonged intellectual reflection do not agree with the unconstrained charm of a woman. Kant associated woman’s nature not with science, but with feeling: “her philosophical wisdom is not reasoning but sentiment.”² This idea, taken with Daniel Barber’s suggestion that the philosophy of Kant is distinctly attached to a theological discourse – that is, theology as viewed from the vantage of philosophy – denotes a secular paradigm of gender inequality. Further, answering the question “is equality secular?” Wendy Brown posits that liberal governments ignore this inequality. Brown suggests that the family in Western society is given sacred status in both a religious and liberal sense, yet is articulated in each through a language of subordination.³ In this way, gender inequality is both secular and religious.

Part of the aim of this article is to provide some historical insight into Brown’s question. Although its total consideration is too ambitious, a narrower

¹ Wendy Brown, “Introduction,” in *Is Critique Secular? Blasphemy, Injury, and Free Speech*, eds. Talal Asad, Wendy Brown, Judith Butler and Saba Mahmood (New York: Pimlico, 2013), 5.

² Immanuel Kant, *Observations on the Feeling of the Beautiful and Sublime and Other Writings*, eds. Patrick Frierson and Paul Guyer (Cambridge: Cambridge University Press, 2011), 38.

³ Wendy Brown, “Is Equality Secular?” (Talk given at the *Postcolonial and Liberal Discourses Forum*, Berkeley, CA, November 16, 2010.)

examination of gender subordination in the scientific careers of women in the mid and late modern period should afford some clarity into its justification. Londa Schiebinger has considered gender and science in a secular framework to some extent and concluded that gender difference within the scientific profession was linear across secular and religious thought – that is, explained differently to achieve the same end.⁴ A study of women in scientific inquiry, thus framed, will illuminate not only the history of female contributions to secular ideas but also the believed and reasoned justifications for subordination *as well as their practical expression*. I discuss most notably the experiences of Caroline Herschel and Marie-Anne Paulze Lavoisier. I suggest that their private (Caroline) and public (Paulze) participation in scientific activity acted to combine the private and public spheres that continue as central determinants of secularity. The confused space advantaged women practitioners in some ways and hindered them in others. A proper understanding of women’s scientific careers in the mid- to late-modern period should thus not be categorized as normally private – within the scientific home women necessarily crossed into the public realm, and conversely into the public realm they brought their “private” character. Furthermore, a second contention of this article is that gender inequality in Enlightenment science should be divorced from concepts of religion and secularism. Rather, secularism, the great equalizing project, will be shown to have affirmed gender disparity.

Well into the nineteenth century, most scientific activity took place within private homes. Women were excluded from universities and academies, yet in the private sphere they were still able to participate in science. According to Patricia Fara, women most typically became engaged at a practical level when a male relative was carrying out research.⁵ Commonly, women performed the role of assistant and essentially worked to liberate their men from other duties. However, this was often achieved in distinctly sophisticated ways: learning foreign languages to keep husbands and brothers up-to-date with the latest scientific research from

⁴ Londa Schiebinger, *The Mind Has No Sex: Women in the Origins of Modern Science* (London: Harvard University Press, 1989), 273.

⁵ Patricia Fara, *Pandora’s Breeches: Women, Science and Power in the Enlightenment* (London: Pimlico, 2004), 10.

abroad and collating, editing, illustrating, and publishing books that would subsequently appear under the male's name. Perhaps most significantly, women also undertook the vital task of translating and interpreting complicated ideas.⁶ If the reason behind the gendered division of labour was the assumed inferiority of the female mind, then the choice to delegate scientific interpretation to female partners was indeed odd. The wives of Charles Darwin and Charles Lyell illustrate this point. Darwin saw biological difference as the impetus for man's greater capacity for deep thought, reason, or merely the use of the senses and hands. Women, loyal to their maternal instincts, took more keenly to tenderness and selflessness, leading Darwin to conclude, "The average standard of mental power in man must be above that of woman."⁷ He held this opinion while simultaneously employing not only the editorial efforts of his wife Emma and other female naturalists, but also their abilities in exposition – essentially relying on a team of women to make comprehensible his theory. Lyell, the lawyer geologist, depended on his wife Mary to read to him because of his poor eye sight (often in translation of German articles which he could not understand), to illustrate and edit his books, and even become more knowledgeable than he in conchology – teaching their maid Antonia to an expert level on the subject.

Thus, women's initiation to such intellectual activity normally occurred in private settings. Idealized secularism would relegate the religious and emotional, restated as the passions, to the private sphere and to the home. In doing so, it is held that reason could thus prevail in the public or political theatres. The immediate implication is that family dynamics operated along lines other than reason – that if women were subservient in the home it was perhaps not due to rational sensibilities. That otherwise rational, objective, and emotionless activity was then brought within this setting confuses the separation. In his discussion of the liberal project, Talal Asad suggests that the secular "should not be thought of as the space in which *real*

⁶ Fara, *Pandora's Breeches*, 10.

⁷ Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* (New Jersey: Princeton University Press, 1981), 326–327.

human life gradually emancipates itself from the controlling power of ‘religion.’”⁸ Indeed, women’s subservience was repeatedly articulated and asserted in both secular and religious spheres. Perhaps this is owing to secularism’s dependence on the *natural* – a category that is necessarily *interpreted* and emphasized in religion – to explain practice. We will see that women’s inferiority was explained as *natural* in both a secular and religious sense, as the public/secular character of science was practiced in the private/religious space of the home.

As described, both Christian and Enlightenment philosophical traditions found ways to maintain disparity, and did so by employing various theories of sexual difference. In the early sixteenth century, ideas about sexual difference seemed to be on the verge of change paralleling a new anatomy. The thought of Plato, Democritus, and Galen that took women to be “imperfect men” was being phased out. In its place, female sexuality began to be defined by reproduction. The Parisian doctor L. Couvay remarked that women were to be cherished since only they can replenish the human race.⁹ Georges-Louis Leclerc, Comte de Buffon, the leading naturalist of the eighteenth century, insisted that males and females contributed equally to generation in reproduction. Yet the revolution in views of sexual difference failed to produce an equivalent revolution in views of secondary sexual differences.¹⁰ That is, while men and women were becoming *biologically* understood as more equal, their *natures* remained unequal. Beyond reproductive organs, the question of sexual difference did not bother Enlightenment anatomists, implying an intensely psychological understanding of sex and gender. Silence on the matter allowed biology and natural behavior to be conveniently divorced in a way that maintained feminine subservience. If those in the vanguard of the new anatomy did not consider secondary sexual character, others did. Helkiah Crooke of the London College of Physicians concluded that the bodies of women betray their weaker heat: “the habit of a woman is fatter, looser, and softer – fat is not generated but by a

⁸ Talal Asad, *Formations of the Secular: Christianity, Islam, Modernity* (Stanford: Stanford University Press: 2003), 191.

⁹ Schiebinger, *The Mind Has No Sex*, 178.

¹⁰ Schiebinger, *The Mind Has No Sex*, 181.

weaker heat.”¹¹ Others like William Harvey still connected the antiquated concept of heat to sexual character. The utilization of antiquated humoral medicine to explain feminine nature, in spite of new anatomical knowledge produced by Vesalius and others, illustrates a disconnect between nature and biology. Despite new understandings of human anatomy, the “special nature” of women endured.

In her discussion of male and female in philosophy, Genevieve Lloyd notes a difference between Augustinian thought on feminine intellectual character and that which pervaded the middle of the eighteenth century. Working from the Christian tradition of biblical exegesis, Augustine saw woman as being man’s equal spiritually, but maintained her inferiority to stay consistent with the Genesis subordination. Woman was man’s equal *if* she applied herself in a helpmate role. Further, Thomas Aquinas understood woman’s subservience as stemming from her commitment to reproduction, which is distinct from intellectual functioning – the true human nature. Yet while Augustine and Aquinas saw women as inferior in relation to a single standard, Rousseau saw the minds of men and women as quite different in ways that make them “complementary.” Kant suggested that a woman who attempts to be learned “might as well even have a beard,” and that in matrimonial life the united pair should, as it were, “constitute a single moral person.”¹² In other words, there existed a certain inappropriateness in the female pursuit of masculine intellectual functioning – a woman not only could not but should not endeavor to think rationally or scientifically. If she did, she necessarily undermined her potential to complement her husband and ultimately her family – what Hegel called the Ethical Family. This lends itself neatly, as Lloyd has observed, to a subsequent division of labour in the same way as did the thought of Augustine and Aquinas. Thus, debate centered on private and public spheres divides these realms of activity not only in accordance with concepts of religion and secularism but also with gender and sexual nature.

¹¹ Schiebinger, *The Mind Has No Sex*, 187.

¹² Genevieve Lloyd, *The Man of Reason: ‘Male’ and ‘Female’ in Western Philosophy* (London: Methuen, 1984), 75.

I consider here Caroline Herschel and her life as it relates to secular theory of private spheres. Born in 1750 in Hanover, Caroline Herschel – sister of history’s most prolific telescope builder William Herschel – spent her life in service to her brother. Growing up in Hanover, her mother insisted that Caroline stay in the home even to the rejection of outside learning opportunities. Her five brothers were rigorously trained as musicians, but from her mother’s perspective, Caroline’s participation threatened the family harmony. Visible here is Hegel’s model of the



Figure 1: Caroline and William Herschel, coloured lithograph after Alfred Diethe c. 1896.

Ethical Family and Rousseau’s paradigm of complimentary gender hierarchies. Some scholars point to the Reformation as the backbone of gendered educational practices in Germany, arguing that the way girls were *taught to learn* mattered as much if not more than *what they actually learned*. According to Emily Winterburn, Caroline was taught to put her skills to use “in a way that was useful to her family.”¹³ Even non-domestic skills were employed in completely domestic ways. Some have also pointed to the craft organization of astronomy as being advantageous for women at this time. Law

¹³ Emily Winterburn, “Caroline Herschel: Agency and Self-Presentation,” *Notes and Records of the Royal Society* 69, no. 1 (March 2015): 69–83.

required every guild master to have a guild wife.¹⁴ But the structure in which most scientific couples worked fused the workplace and the home, affording the woman a more comprehensive role.

As an adult, Caroline performed William's calculations as he observed the sky each night, arranged everything systematically, and collated his work in publishable form. Pictures of Caroline depict her as a humble assistant to William. In the figure below, Caroline administers a cup of tea to William as he polishes a mirror. William would spend hours over top of a mirror, not lifting his hand to risk losing the molding heat produced by the friction. Yet no mention is made here of the many more hours Caroline spent preparing the materials needed for such work.¹⁵ The room is filled with historic astronomical instruments with which Caroline would have been intensely familiar, yet she serves as he works.

After moving to Bath with her brother in 1772, Caroline was taught English, arithmetic, and book-keeping – skills that would make her useful to William in his amateur pursuit of astronomy. Earning his living as a musician, he passed on tedious chores to her, and as her utility increased her lessons came to include algebra and geometry. Still, she wrote, "I began to think on how those hours I should now be left to myself might best be spent, in learning what would become necessary to know for a housekeeper of our little family."¹⁶

William's discovery of Uranus in 1781 procured him a royal pension from George III. Now practicing astronomy full time, William turned his interest to the cataloguing and classification of stars, and he set out to take inventory of the galaxy in this way. Caroline's importance to the project only increased, her cataloguing skills on full display. Indeed it was only after her success at logging nebulae that William chose to pursue this new line of enquiry.¹⁷

¹⁴ Merry Wiesner, "'Women's Work' in the Changing City Economy, 1500-1650," in *Connecting Spheres: Women in the Western World, 1500 to the Present*, eds. Marilyn Boxer and Jean Quataert (New York, 1987), 66.

¹⁵ Fara, *Pandora's Breeches*, 156.

¹⁶ John Herschel and Caroline Lucretia Herschel, *Memoir and Correspondence of Caroline Herschel* (New York: D. Appleton and Co., 1876), 32.

¹⁷ Fara, *Pandora's Breeches*, 150.

His observation became systematic. William gave his sister a small telescope of her own, one that by design was ideal for comet searching. Her solitary observations, though as she writes she was hesitant and guilt ridden to conduct them in her brother's absence, produced huge results. When William left to deliver telescopes, she filled her free time by sweeping the skies on her own. When she discovered a comet in 1786 she uncharacteristically reported it to the Secretary of the Royal Society, though in striking language: "I venture to trouble you with the imperfect account of a comet" she wrote in her typical self-denigrating fashion.¹⁸ When William returned, she resumed her satellite existence, although she did receive a royal salary as William's assistant.

Caroline found her second comet in 1788 when William was away travelling with his new wife. By 1797, she had discovered eight comets in total, and nearly all had been during periods where William was away. By her seventh and eighth discoveries, it might even be said that Caroline had gained a degree of confidence. Her letter to the Royal Society after finding the seventh read: "As the appearance of one of these objects is almost become a novelty, I flatter myself that this intelligence will not be uninteresting to astronomers."¹⁹ Her success afforded her a degree of international fame among the international community, and yet Caroline continued to participate in her own oppression: "I am nothing, I have done nothing...a well-trained puppy-dog would have done as much."²⁰ Despite her notable renown, she still willingly took on tedious work for William, finishing Flamsteed's British star catalogue that had remained ridden with errors to that point. After William's death in 1822, she moved back to Germany to transfer her servitude to her nephew John, William's son. Fara notes that she seemed "determined to be miserable," religiously performing upwards of 2,500 calculations daily for Jon's astronomical pursuits, only pausing to regret that John's achievements in the field might detract from William's fame.²¹

¹⁸ Herschel, *Memoir and Correspondence*, 65.

¹⁹ Herschel, *Memoir and Correspondence*, 94.

²⁰ Herschel, *Memoir and Correspondence*, 167.

²¹ Fara, *Pandora's Breeches*, 163.

How might we parse such a commitment to servitude? Michael Hoskin has pointed out that the Herschels were no doubt convinced of some creator, but were largely indifferent to the Christian God. William even recommended to John a career in the Church so “that he should have ample leisure time for the attainment of all manner of civilized accomplishments.”²² The example of the Herschels, then, has illustrated that if secular theory would ideally relegate passion to the private to liberate reason for the public, it seems as though, within man-woman scientific partnerships, there is a sort of blending of the spheres. Rational scientific pursuits, where absolute accuracy was of critical importance and that mirrored public forums, took place within the structure of the family. Perhaps this is a microcosm of Talal Asad’s assertion that the private determines “not only the background by which shared principles of that culture are interpreted, but also what is to count as interpretive background as against foreground political principles.”²³ Put more simply, the distinction between private and public realms blurred considerably – not only here, but significantly here – and yet Caroline’s subservience endured on the grounds of sexual difference, calling into question inequality’s association with either or both religion and secularism.

It is important to remember, if we are to accurately consider the Lavoisiers in relation to the Herschels, the differences in English and French science in the late eighteenth century. English achievement relied heavily on private enterprise and individual initiative – the Herschel’s small royal salaries were exceedingly uncommon. Conversely, in France both before and after the Revolution, the state supported scientific research. When thinking about public and private spheres and scientific endeavor, the fact that the state explicitly supported research in France adds another lens through which to view this history.

Marie Anne Pierette Paulze Lavoisier’s life seems to, when viewed from afar, resemble closely that of Caroline Herschel. Living at almost the same time, both women dedicated the overwhelming majority of their lives to a single man. And yet

²² Michael Hoskin, “William Herschel and God,” *Journal for the History of Astronomy* 45, no. 2 (2014): 251.

²³ Asad, *Formations of the Secular*, 185.

their experiences show quite differently. Herschel and Lavoisier were born into very different family circumstances. Paulze was rich from birth, outward-looking, and “deeply committed to social reform.”²⁴ She was just thirteen when she rejected her first suitor to marry instead the twenty-eight year old chemist Antoine Lavoisier. Patricia Fara has noted that, were Paulze English, she probably would have “found herself automatically excluded from male intellectual circles” – *because* she lived in revolutionary Paris she could access certain intellectual groups.²⁵ The assumption, then, is that the emerging “secular” state created the space for a woman chemist.

Antoine Lavoisier significantly promoted his career and financial situation when he married Paulze, the daughter of one of his senior colleagues. But if not through marriage, a key place for men to network and garner patronage was in *salons*. Often presided over by reputable women, these arenas of discussion acted as power bases from which wives could arrange patronage for their husbands. In this way, Antoine’s success virtually depended on his wife’s ability to organize and run a successful *salon* with esteemed guests. Paulze hosted Benjamin Franklin, Joseph Priestly, and James Watt among others on a weekly basis. Yet such opportunity failed to produce notable differences in Paulze’s capacity to participate. French Revolutionary ideology perceived women as mediators – civilizing agents whose docility was valuable because it moderated male aggression. Rousseau, Kant, and Hegel took gender to be complementary, such that rational male thought was facilitated rather than improved by its female counterpart. Paulze’s main public functions, then, were to garner patronage for her husband, to ensure the success of the night’s discussion, and to meticulously care for guests. Her occasional forays into the public discussion were met with surprise – one American visitor commented, “From her Manner it would seem that she thinks her forte is the Understanding rather than the Person.”²⁶ *Salons*, deliberately secular and purposed to celebrate acquired nobility over inherited nobility, tacitly affirmed the inherited traits of women by limiting their full participation. The *salon* is a nice illustration of

²⁴ Fara, *Pandora’s Breeches*, 167.

²⁵ Fara, *Pandora’s Breeches*, 173.

²⁶ Gouverneur Morris quoted in Denis I. Duveen, “Madame Lavoisier, 1758–1836,” *Chymia* 4 (1953): 17.

how women could fuel the public sphere without driving it – women “served as powers behind the throne but could not themselves sit on the throne.”²⁷

It is clear that even in the seemingly secular break that was the French Revolution, concepts of sexual difference acted along intentionally secular lines to mitigate women’s scientific activity. Revolutionaries issued an arrest warrant for the Lavoisiers in 1793. Antoine, accused of profiteering by an old nemesis, met the guillotine a year later, and Paulze watched her apartment be slowly emptied as officials confiscated her husband’s possessions. She too was arrested, spending 65 days in prison before her eventual exoneration. Even then, her release was only possible (according to the surveillance committee) because in her “collaborating daily with her husband in his work, she was involved only with what related to their domestic occupations.”²⁸



Figure 2: A man seated in a barrel with his head under a glass canopy; he breathes and his pulse is taken; Lavoisier dictates to his wife who is writing a report. Drawing attributed to M.A.P. Lavoisier, c. 1790 (*Wellcome Library, London*).

There is no doubt that in practice, Parisian salons afforded women of status new opportunities to become involved. There is also little doubt as to the theory that allowed for this. As a public

forum so central to the liberal project, the Parisian *salon* was in this way somewhat organized according to a philosophy of biological difference – severely undermining the ideal of equal and rational debate.

Paulze was also an adept artist. Taking lessons from the artist Jacques-Louis David, she had learned drafting techniques to more accurately reproduce Antoine’s

²⁷ Schiebinger, *The Mind Has No Sex*, 32.

²⁸ Jean-Pierre Poirier, *Lavoisier: Chemist, Biologist, Economist*, trans. Rebecca Balinski (Philadelphia: University of Pennsylvania Press, 1998), 393.

equipment and ideas. These drawings were of central importance to the success and significance of Antoine's work. In the same way that Galileo's *chiaroscuro* advantaged his lunar renditions, Paulze's scaled diagrams of Antoine's instruments enabled other chemists to build their own identical instruments and so reproduce Lavoisier's results. More practically, her duties resembled closely those of Caroline Herschel's. Paulze recorded observations as male experimenters called them out, systematically organized experiments, and re-interpreted Antoine's notes and research. Her own reproduction of a typical experiment in the Lavoisier household places Paulze as a removed observer, dutifully watching and recording the events as Antoine and his team conduct hands on work.

In 1787, Paulze translated and published Richard Kirwan's *Essay on Phlogiston and the Constitution of Acids*. The translation made Kirwan's crucial work available to Antoine, who immediately engaged the Irishman.²⁹ The two chemists had competing arguments about phlogiston - a substance thought to exist in all combustible bodies. Paulze was knowledgeable enough in chemistry to poke holes in Kirwan's defense of the subject, often adding critical comments in her French translations (although hiding behind the title of "Translator's note") and even acting in a "theatrical mock-inquisition" where she played the part of a high priestess sacrificing phlogiston's supporters on the altar of Lavoisier's truth.³⁰ Her anonymous comments on Kirwan's work can be seen as a breach of the unwritten rules of French intellectual marriages that were based on ideas of complementarity.

Thus, Paulze's scientific experience seemingly differed from Caroline Herschel's only in its definition. The overseer of her own esteemed *salon*, Paulze can be seen as having significantly more access to intellectual communities than her counterpart. And yet, if Caroline Herschel's subservience was learned in school, instilled through craft family tradition, and practiced daily in a christianiform household, Paulze's stemmed from French Revolutionary philosophy – rooted in ideas of complementarity – that reified feminine nature. Her *salon* participation, her

²⁹ John West, "The Collaboration of Antoine and Marie-Anne Lavoisier and the First Measurements of Human Oxygen Consumption," *American Journal of Physiology* 305 (December 2013): 778.

³⁰ Fara, *Pandora's Breeches*, 179.

contributions to Antoine's work, and her economic concern speak of a significantly more public player than was philosophically allowed. Ultimately, neither Caroline's private (religious) practice nor Paulze's public (secular) participation could overcome systems of subservience.

It is evident that gender inequality has been articulated and practiced in both private and public spheres. Further, the "special nature" of women has been shown to have pervaded Enlightenment scientific practice in both a religious and secular sense. If we are indeed to understand the history of science as inextricably linked to that of religion, it is crucial to comprehend the total weight of its forming influences. Any movement against suspect hero narratives must consider issues of religion and secularity if it is to ultimately unseat the patriarchal structure of scientific history. The women presented in this paper experienced a structured subservience that drew power from systems of both faith and rationality. Gender inequality in the pre-modern era under both religious and secular regimes was therefore continuous, constant, and separate from any particular motivation.

Bibliography

Illustrations

1. Caroline and William Herschel, coloured lithograph after Alfred Diethe, c. 1896 (*Wellcome Library, London*).
2. A man seated in a barrel with his head under a glass canopy; he breathes and his pulse is taken; Lavoisier dictates to his wife who is writing a report. Drawing attributed to M.A.P. Lavoisier, c. 1790 (*Wellcome Library, London*).

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