PORTRAITS OF SCIENCE

Two Good Women, or Too Good to Be True?

Paula Gould

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The seeds of martyrdom were sown for Caroline Herschel and Mary Somerville by Victorian and Edwardian biographers.

It can sometimes seem as if the history of women scientists is little more than a chronology of hardworking heroines. Did any women solve long-standing physical problems while musing in the garden, plagiarize a colleague's data to interpret an unexplained phenomenon, or badmouth the work of a rival to gain glory for themselves? If they did, we don't hear too much about it. Instead, we read how hardworking (and possibly downtrodden) female scholars with a passion for sums, stars, or fossilized shells, toiled long and hard in their chosen field of study to make worthy contributions to the pool of scientific knowledge. These models of scientific purity may have made new discoveries, written authoritative papers, or compiled admirable collections of specimens, but we see their achievements as a simple consequence of unstinting effort.

Caroline Herschel (1750–1848)

Take Caroline Herschel (1750–1848) and Mary Somerville (1780–1872), for example, two icons of female scientific heroism. Biographical material for both women is relatively easy to find. Simply typing their names into an Internet search engine yields a number of links to Web pages that contain brief histories (*1*). More detailed information can be gleaned from academic studies of "women in science" or "women in mathematics," for those wishing to fill in the gaps (*2–4*). We read of an honest and almost emotionless devotion to mathematics (Somerville) and astronomy (Herschel), with no hint of blind ambition, enthusiasm, or competitive spirit. Every ounce of energy that they had left after having completed numerous domestic duties appeared to be channeled into scientific study without a whiff of controversy, wrongdoing, or impropriety.

Delving deeper into archives, several biographical sketches can be found of both women published during the late 19th and early 20th century (*5*). It is here, I believe, that the seeds of martyrdom were sown. Biography was an extremely popular literary genre at the turn of last century. Tales of inspired inventors, eminent statesmen, and brave explorers jostled for space on library bookshelves. Although women didn't tend to feature in these narratives of manly endeavor and genius, they did find a place in "great women" collections. The titles speak for themselves: *A Few Good Women and What They Teach Us* (1886); *Twelve Notable Good Women of the Nineteenth Century* (1899); *Famous Sisters of Great Men* (1905); *The Romance of Woman's Influence* (1906). Readers were urged to follow the example of these heroines, who fit intellectual and social work around existing family commitments and societal expectation (*6*). Being good, following the rules, complementing the skills and qualities possessed by their husbands and/or brothers—this was how even emancipated, educated women were encouraged to behave. Caroline Herschel and Mary Somerville proved to be ideal subject matter for authors of such works.

Mary Somerville (1780–1872)

Let us take a look at their life stories through the eyes of Victorian and Edwardian commentators. We learn that Caroline Lucretia Herschel moved to England from her native Germany to live with her elder brother William. Having been brought up to be a musician by his father, William had found work as an organist in Bath and was keen for his sister to join him there. On moving to England, Caroline trained as a singer under William's tutelage, becoming a successful soprano, while also acting as housekeeper at their town house.

The Herschels' dual careers as professional musicians proved to be short-lived, though. When not engaged in musical activities, William Herschel had spent his spare time pursuing an interest in astronomy, becoming adept at constructing telescopes. Yet again, his younger sister assisted in his endeavors, learning the basics of astronomical science from her sibling mentor in between household duties and musical engagements. The status quo shifted in 1781 when William discovered the planet now known as Uranus and thereafter received a £200 annual salary from King George III. This prompted the would-be astronomer to give up his paid conducting work and to concentrate on heavenly observation full time. Caroline dutifully abandoned her own musical activities, and adopted the role of apprentice-cum-sisterly helpmeet.

Over the next 5 years, Caroline reputedly developed an active interest in astronomy in her own right. In addition to performing detailed mathematical calculations on data collected by her brother, she made methodical sweeps of the sky to search for comets, using a small telescope that William had provided. Her efforts were rewarded on 1 August 1786, when she discovered her first comet. Yet we also

Paula Gould works as a freelance science and medical writer and editor, based in Chester, U.K. She has a Ph.D. in History and Philosophy of Science. E-mail: Paula.Gould@absw.org.uk

hear how she continued to act as cleaner, cook, and general bottle-washer to her beloved brother. Her insistence that he not miss meals, even when engrossed in time-consuming tasks, has acquired almost legendary status. She was so concerned for his nutritional welfare that she even pushed morsels of food into his mouth as he polished the mirror on his reflecting telescope.

The period 1786 to 1798 was a significant time in Caroline Herschel's life, we are told, not least given the marriage of her brother William in 1788. This apparently came as quite a blow to a woman who had thus far devoted her life to helping her brother. Nonetheless, now officially recognized as William Herschel's assistant and paid an annual salary of £50 from King George III, Caroline Herschel went on to discover seven more comets. She also embarked on a mammoth project to correct and cross-reference Flamsteed's authoritative star catalog, completing her index and list of omitted stars in 1798.

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Caroline Herschel's scientific productivity then ceased until William's death in 1822, at which point she turned to help her nephew, John Herschel, in his astronomical studies, apparently lapsing into the role of humble helpmeet. Her completed catalog of 2500 nebulae, finished in 1828, won her a gold medal from the Royal Society of London. She spent the remainder of her life back in Hanover, receiving visits from many notable scientists and accruing recognition for her past work, including honorary membership in the Royal Astronomical Society in 1835.

Caroline Herschel was not the only woman to be honored by the Royal Astronomical Society that year. The Society took the same opportunity to bestow honorary membership on Mary Somerville, whose accessible accounts of mathematics and physical science were winning considerable praise from the scientific community. It had been a long, hard struggle, according to accounts published many years later.

Biographers tell how Mary Fairfax Somerville's early interest and self-study in mathematics was tolerated (if not encouraged) by her immediate family, then essentially stifled in 1804 by marriage to an unsympathetic husband, Samuel Greig. Greig's death, just 3 years later, is generally portrayed as a blessing in disguise, with his young widow wasting no time in renewing her studies. Her second match in 1812 to William Somerville, however, is widely agreed to be better and pivotal to her later success.

William Somerville not only shared Mary's interests in mathematics and science, but he also actively supported her thirst for knowledge. After all, she not once neglected her domestic duties. Apparently an excellent housewife and skilful needlewoman, as well as a loving mother, she allegedly prepared some delicious black currant jelly to ease her husband's sore throat after their wedding. Culinary achievements aside, Mary Somerville's debut as a member of the scientific community eventually came in 1826, when she presented a paper to the Royal Society on the magnetic properties of violet solar rays. It is her next two ventures, though, a translation and expansion of Laplace's classic *Méchanique Céleste* and an account of relationships between physical phenomena, that really secured her reputation. *The Mechanism of the Heavens* attracted much praise on its publication in 1831, as did *On the Connection of the Physical Sciences*, when it appeared in 1834. Critics marveled that a woman could pen works of such accuracy, and copies sold well. Still Mary Somerville kept modest and diffident of her own talents, readers were told, not wishing to seek glory in an "unwomanly" manner.

That's not to say that the honors she received were rejected. In addition to the recognition of the Royal Astronomical Society, Mary Somerville took up a civil pension of £200 (later raised to £300), and was elected to honorary membership of the Royal Irish Academy. Admirers from the Royal Society also commissioned her bust to be made and displayed in the Society's library. In 1848, she published what many considered to be her most successful scientific treatise, *Physical Geography*. The work passed through numerous reprints and editions and was translated into many different languages for use in schools and universities worldwide. Her final contribution to scientific literature, *On Molecular and Microscopic Science*, appeared in 1869. Mary Somerville was almost 90 years old and still writing.

So we have a picture of two diligent, well-behaved women. Their blameless characters contrast sharply with the many men of science who have emerged from the archives with slightly grubbier reputations. How about George Biddell Airy (1908–1892), the former Astronomer Royal, who entered into a prolonged and rather unpleasant rivalry with Charles Babbage (*1*). And then there's Richard Owen (1904–1892), the glory-seeking anatomist who schemed his way up the scientific greasy pole to become known as the man who named the dinosaurs (*7*). We may not necessarily like these men, but they were and are still admired.

Caroline Herschel and Mary Somerville, on the other hand, appear guilty of merely bending a few rules of etiquette, rather than outwitting their colleagues in the rush for recognition. Similar behavior from members of the fairer sex would doubtless have been frowned upon. Ladies at this time were expected to learn needlework, not nebular theory, and to amuse themselves by playing the piano rather than solving differential equations. Yet both our heroines appear to have navigated their way around possible objections with ease, silencing any possible dissenting voices by combining an appropriate model of dutiful, ladylike conduct with their scientific studies. Perhaps we should be applauding their skill in presenting a vision of domestic and scientific harmony, leaving critics of women's intellectual activity little or nothing to attack?

We will never know if Caroline Herschel and Mary Somerville were really this worthy and industrious. However, one thing seems certain. No matter how much their lives have been polished into shape for academic history books, research papers, and celebratory Web sites, their lifestories are unlikely to feature in glossy hardbacks piled high in book stores. Although narratives of unsung innovators and mathematical eccentrics are once again all the rage, as they were 100 years ago, tales of worthy women have gone out of fashion. Today's readers want a more exciting lead character, not a saintly-but-slightly-dull heroine who succeeded in keeping up appearances. Perhaps it's time to search the scientific archives for a new generation of less well-behaved women.

References

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