

Reviews

Robyn Arianrhod, *Seduced by Logic: Émilie du Châtelet, Mary Somerville and the Newtonian Revolution* (Oxford: Oxford University Press, 2011), 338 pp.

In 1890, Philippa Fawcett scored the highest mark in the mathematics finals (tripos) at the University of Cambridge. She was not, however, eligible to the title accorded to the most outstanding mathematics finalist at that university ('senior wrangler'). She was not even entitled to a degree. The fact that it took another half century before women were able to graduate on equal terms with men from that university is symbolic of the disadvantages and prejudices endured by intelligent women long after the battle for female suffrage and right to education had been won. The two remarkable female mathematicians celebrated in Robyn Arianrhod's study did not even have the chance to study at a university. Gabrielle Émilie le Tonnelier de Breteuil, Marquise du Châtelet took up mathematics in adulthood. She was fortunate to receive encouragement from her lover Voltaire, and, partly by virtue of her position, to eventually be able to obtain the help of two of France's leading mathematicians (Pierre-Louis Moreau Maupertuis and Claude Alexis Clairaut). Improbably, Mary Somerville found a route to mathematics via the needlework magazines considered appropriate for girls like herself for whom domesticity was the only career direction. She enjoyed solving the algebraic brain teasers that embellished these publications. Her family, however, quickly nipped in the bud this nascent interest in mathematics and she was only able to pursue her interest thanks to the encouragement of her second husband.

Despite these disadvantages, both women managed to attain a mastery of mathematics equal to the task of translating the work of two of the most eminent mathematical physicists in history: Sir Isaac Newton and Pierre-Simon La

Place (who was considered the Newton of his day). Émilie du Châtelet's French translation of Newton's *Principia mathematica philosophiae naturalis* was published posthumously in 1759. Mary Somerville's translation of Laplace's *Mécanique céleste*, appeared in 1831. Both women were more than translators – Émilie du Châtelet was at the forefront of promoting Newtonianism in France, as well as ideas of Newton's *nemesis*, Leibniz. She wrote a handbook of natural philosophy (*Institutions de physique*) and carried out her own experiments, one result of which was a paper on the nature of fire submitted to the Académie Royale des Sciences. Mary Somerville published books on geography and microscopy, as well as many scientific papers. Her *On the Connexion of the Physical Sciences* (1834) was adopted as a textbook in the universities.. She was among the first to recognize the significance of Darwin's theory of evolution.

The dominant narratives of the history of science and mathematics have never served women well. The fortunate few who have earned recognition have too often been treated as exceptions to the general rule that women are constitutionally incapable of rational thought. Even where they have earned recognition, their attainments have been all too easily sidelined by a distorting focus on priority in the narrative of scientific progress. Furthermore, the adverse conditions under which women managed to pursue their scientific and mathematical interests meant that the best that they could hope for was a supporting role. Such was the fate of the astronomer, Caroline Herschel, over-shadowed by her brother whose work was dependent on hers, or the mathematician Sophie Germain. It is hardly surprising therefore, that much of the sterling work of recovery by feminist historians focuses on the negative experience of women.

None of these narratives can do justice to either Du Châtelet or Somerville, although all apply to them. There is plenty to feed the narrative of negativity. Each has had her share

of being both celebrated as an exceptional woman, and, denigrated as a 'mere' translator. Madame du Châtelet suffered the further indignity that her Newton translation was attributed to Clairaut – her colourful private-life served to re-inforce the prejudice that women were not rational beings. Mary Somerville's ability to play the good-wife role probably made it easier for her to find acceptance in the scientific and mathematical confraternity of her time. She was showered with medals, made fellow of the royal astronomical society, awarded a pension by the government and memorialized in the name of one of the first women's colleges in Oxford. She was nevertheless dependent on her husband as her 'go between' with that male world.

Robyn Arianrhod faces the challenge of fitting both women into the history of science and mathematics by combining biography with expository evaluation of the key aspects of their contributions both as translators and scientists. She offers readers an accessible account of the lives of both her subjects in the context of a fairly standard conception of the history of science as a history of problems. Technicalities are placed in an appendix which provides summary explanations of the scientific theories and the mathematics relevant to individual chapters. She shows in close detail how as translators, both women went beyond their sources, up-dating them as they translated. By focusing on their engagement with the on-going debates and problems with which their contemporaries were concerned, she shows that Du Châtelet and Somerville belonged to the same mathematically literate community.

The biographical aspects are well grounded in reliable sources, principally Judith Zinsser's biography of Du Châtelet and the studies of Mary Somerville by Elizabeth Chambers Patterson's *Mary Somerville and the Cultivation of Science* and Dorothy McMillan's edition of Somerville's own *Recollections*. Historians will balk at the broad-brush referencing, and some fairly broad-brush historical background. The biographical material is necessarily selective, but there are times when one could wish for more detail. There are tantalizing glimpses of other women engaged on the same common enterprise

— Sophie Gauss, Ada Lovelace, Jane Marcet and Caroline Herschel. Although the last three had links to Somerville, frustratingly little is said about them. The supplier of Voltaire's and Du Châtelet's laboratory equipment, Abbé Nollet, does not rate a mention. The history of science model used to provide the context is in many ways traditionally positivist – especially in the treatment of Newton. Religion hardly figures in the biographies: the passing references treat it as straightforwardly antipathetic to science. Newton's religious reasons for relinquishing his Cambridge fellowship are passed over in silence (he needed a less demanding job, apparently). Her account of Leibniz struggles to free itself from Newtonian bias, with the result that Du Châtelet's interest in his philosophy remains puzzling. And the biographies are on occasion cavalier with detail – the 'du' omitted from Emilie's surname, and blurring of distinctions between *noblesse de robe*, and *noblesse d'épée*. Neither Voltaire nor Émilie was 'inspired' by Algarotti – they had already embarked on their Newtonian offensive before they met him. Such details aside, there is no disguising the author's infectious enthusiasm for her subject. She does full justice to the attainments and real achievements of both Emilie du Châtelet and Mary Somerville. This is a book for intelligent non-specialists as well as having plenty of interest for specialists in the history of science, and mathematics.

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