



## An uneven introduction to (too) many forgotten women scientists, studded with many interesting (if not necessarily on-topic) facts

Patricia Fara: *A lab of one's own: science and suffrage in the First World War*. New York: Oxford University Press, 2018, 304pp, US\$24.95 HB

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About halfway through historian of science Patricia Fara's unevenly interesting book, I was prepared to give it a rather unfavorable review. My reaction surprised me, knowing how well respected she is by her professional colleagues, and having been attracted to the book by the laudatory blurbs for and respectful reviews of it, written by people of whom I think highly. One such review appeared in *The New York Times*, written by Dava Sobel, whose own recent book on the history of under-recognized early women pioneers in astronomy was the subject of my recent review in *Metascience*. Among the virtues I extolled in that review both of her book, *The Glass Universe*, and of Margo Lee Shetterly's *Hidden Figures*, was that readers really got to understand the backgrounds and contributions of several women pioneers in astronomy and aeronautics. In the first part of *A Lab of One's Own*, it seemed to me, Fara crams too much into her rather brief book, so that to this reader it read as a hodgepodge studded with interesting tidbits about various topics that do not truly cohere, including the history of the British women's suffrage movement and its connection to science, "laundry lists" of women scientists in England in the late nineteenth and early twentieth centuries, Britain's readiness for World War I, and the various ways British women of different educational and social backgrounds found to contribute to the war effort. I persevered in my reading, however, and beginning with about chapter eleven (of sixteen), I began to feel that individual women were getting the coverage they deserved, emerging as well-rounded individuals. Although I concluded my reading still troubled by some flaws and a few real mistakes, to which I will get in due course, let me begin first with some of the more interesting things I learned along the way from Fara's sweeping coverage of a perhaps too ambitious topic.

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No specialist in the history of British suffrage myself, I don't know whether Fara is the first to consider that movement's interest in science. Whether or not she is, the point she makes is certainly interesting. Not only did suffrage supporters consider themselves allies of scientific and technological progress, but opponents of extending voting rights to women considered both suffrage and science "suspect activities for women," since both posed a threat "to long-established conventions for female domesticity, subservience, and demureness" (57). Fara paints a vivid picture of a 1908 suffrage demonstration in which participants marched under beautifully embroidered banners, some of which honored scientists including science writer and polymath Mary Somerville (1780–1872), astronomer Caroline Herschel (1750–1848), founder of modern nursing Florence Nightingale (1820–1910), and physicist (and soon to be a double Nobel laureate) Marie Curie (1867–1933). Fara also gives a moving explanation of what led her to write this book: her discovery in the archives of the University of Cambridge's all-female Newnham College of a handmade book in which the World War I activities of some 600 Newnham alumnae of different ages are recorded—physicians operating at the front, chemists developing toxic gases and explosives in munition factories, biologists studying infectious diseases in laboratories, and mathematicians working in intelligence. When Fara realized that none of the names were known to her, she decided to find out who these women were and to "create [her] own tribute to these scientific pioneers who had helped win the War and gain the vote" [10]. Six chapters into the book, however, Fara points out the irony of the 1918 extension of voting rights to women; though ostensibly the government's way of rewarding the war work of so many women, many of them were too young to be eligible to vote, since the law enfranchised only women over 30 "who met minimum property qualifications" [106]. Mimicking that irony in her tone, Fara also notes that in 1923, by which time there were eight women Members of Parliament, they were "valued so highly that the nearest lavatory was [a] quarter of a mile from their cramped offices" [108].

Unschooling though I was in the details of the British suffrage movement when I came to Fara's book, I began reading it with a better sense of Virginia Woolf's place in English literary history and in feminist history. For the uninitiated among her readers, Fara explains her choice of title—a nod to Woolf's extended 1929 essay *A Room of One's Own*, which she presented in a lecture series at Newnham in 1928, and which is generally considered a basic feminist text. Feeling smug in that knowledge, however, I was shocked by Fara's proof that not only did the lecturer hold her audience in disdain ("Intelligent eager; poor; and destined to become schoolmistresses in shoals" [6]) but that the audience reciprocated her disdain, with one student admitting she had napped through the presentation and another dismissing Woolf's remarks as lacking profundity (20). Regarding the book's title, I was disappointed upon my inadvertent discovery while looking through her bibliography that Fara is not the first to use it. The bibliography lists an article by Marsha L. Richmond that appeared in the September 1997 issue of *Isis*, "'A Lab of One's Own': The Balfour Biological Laboratory for Women at Cambridge University, 1884–1914." Especially since Fara discusses Newnham's Balfour Lab

in Chapter 7, she should, in the interest of full disclosure, have credited Richmond's article as the source of her book's title.

As the author of short book-length biographies of both Marie Curie and Ernest Rutherford, I learned something new about each from this book, but also found in Fara's coverage of them something to complain about. From my work over the past 25 years on Curie, I was well aware of her friendship with British physicist and electrical engineer Hertha Ayrton. Curie famously took shelter at Ayrton's home in August 1912, while recovering from the physical illness and depression that laid her low for much of the year following the discovery that Curie and her married colleague Paul Langevin were romantically involved. I did not know, however, about Ayrton's involvement in the suffrage movement. Just as she sheltered Curie, Ayrton also took in suffragette leader Emmeline Pankhurst in 1913, when the activist was temporarily released from jail. Furthermore, although Curie was cautious about signing petitions, Ayrton succeeded in getting her to sign a protest objecting to the imprisonment of suffragettes (67). Also regarding Ayrton, an offhand comment Fara makes in chapter 7, leading me to her footnotes and bibliography and then to a Google search, I learned another unexpected fact: that her stepdaughter, Edith Ayrton Zangwill, not only wrote a fictionalized version of her stepmother's life in her 1924 novel, *The Call*, but also helped organize the Jewish League for Woman Suffrage, and was married to cultural Zionist Israel Zangwill, about whom I have written elsewhere (116). I would, however, like to have seen a footnote for the source of Fara's assertion that Ayrton taught math to Curie's elder daughter, future Nobel laureate Irène Curie (67)—a claim I have seen nowhere else.

I was pleased to see Fara's acknowledgment that both Ernest Rutherford and William Soddy, his colleague in researching the process of radioactive decay, "had several female assistants and fully credited their contributions" (120). I regret, however, that she fails to mention Canadian scientist Harriet Brooks, the best known of Rutherford's female collaborators at McGill University, and that when she does mention "one of Rutherford's protégées" who did wartime research on explosives at several government facilities, often as Chemist in Charge of Laboratory, she not only misspells May Lesslie's surname (151) but also gives incorrect page references in her notes to the 1997 *Chemistry was their Life*, by Marlene and Geoff Rayner-Canham, from which Fara drew her information. In her breezy assertion that women were treated badly during the war at the Cavendish Laboratory, Fara also misses the opportunity to acknowledge the change that took place there once Rutherford became its director in 1919. She might have noted, for example, Rutherford's vocal support for women's rights, including his letter to *The Times* of 8 December 1920, in which he and a chemistry colleague urged their fellow academics to extend full rights to women at Cambridge, stating unequivocally that "we welcome the presence of women in our laboratories."

The one (albeit two-pronged) mistake I found in the book comes in Fara's coverage of the dramatic literature, not of science, but it always troubles me when an author makes an error in something I know a lot about; can I trust the author, then, to be correct in other areas about which I know less? The offending mistakes appear in chapter 4, where, in a section called "Being Modern," she both summarizes Henrik Ibsen's play *Hedda Gabler* and mentions its effect on audiences

when it appeared on the London stage in 1889. Sadly, she is wrong both about the date, since the world premiere was in Munich at the end of January 1891, and in her plot summary. Her statement that Hedda “storm[s] out of her repressive marriage to pursue an independent existence,” making her “a figurehead for real-life British women who claimed the right to vote and to run their own affairs” (52), is true not of Hedda but of another Ibsen heroine, Nora Helmer, protagonist of his earlier play *A Doll’s House*.

While I have expressed my disappointment in the short shrift Fara gives to so many of the women scientists whose lost history she hopes to reclaim, I feel no compunction about giving only a few sentences to each of the following women whose lives and work she covers more fully. Representing different fields—industry, academia, medicine—each one leaped out to me from the book’s pages. Interested parties know where they can find out more about them and about many others who engaged simultaneously in the advancement of equal rights for women and of Britain’s war effort by putting their science backgrounds to work in different ways.

Caroline Haslett (1895–1957) had been written off by her schoolteachers “because she never could learn how to sew a buttonhole” (70). Although at war’s outset she was a mere clerk in a boiler factory, during the conflict she rose through the ranks as a replacement for male recruits. By the time the war ended, she was running the factory’s London office, negotiating contracts with the War Office, among others, where her “expertise in a man’s domain” never failed to impress (70). After receiving some training in engineering, she became founding editor of *The Woman Engineer*. Her work to free up women to pursue their interests outside the home by putting electrical power to work to lighten their household chores led to her becoming first director of the Electrical Association for Women.

Dame Helen Charlotte Isabella Gwynne-Vaughan, née Fraser (1879–1967)—the mouthful of whose name indicates her social class—gets particularly nuanced treatment, as hinted at by Fara’s comment at the end of chapter 12: “Perhaps no more than any other woman of her generation, as a scientist and a military officer she had ventured into two male-dominated territories and in each one had fought her way to the top, where women as well as men resented her success” (215). Fara tells the story better than I can in only a paragraph, but suffice it to say that this head of the Department of Botany at London’s Birkbeck College was unconventional in many ways. She dressed fashionably as she had been raised to do, but hardly like most women scientists; had a commuting marriage with her colleague David Thomas Gwynne-Vaughan, unusual for that time; and she may have had dalliances during their periods of separation. In the 4 years of their marriage, cut short by his death from TB in 1915, she failed both to get pregnant once she decided she wanted a family, and to win a position in his laboratory in Belfast, where she had turned off his colleagues by insisting on a lifestyle deemed unbecoming a faculty wife. In 1917, she leaped at the opportunity to serve as Controller of the Women’s Army Auxiliary Corps (WAAC) in France, for which service she became the first woman to be awarded a military DBE (Dame Commander of the Most Excellent Order of the British Empire). Her three attempts to be elected to Parliament failed, but she continued her fight for equality for women. Her search for a postwar academic

appointment foundered until the end of 1919, when she resumed her prewar position at Birkbeck, becoming the first female professor 2 years later. She remained an unpopular person for much of her career, despite her effectiveness, and the quality, originality, and accuracy of her academic output was challenged by some. Her 1927 university textbook on fungi may have been inclusive, but it was criticized for merely conveying information rather than leading her readers to think for themselves. As Fara sums up her story, “The life of a pioneer is inevitably hard, and she suffered” (215).

Louisa Garrett Anderson (1873–1943) and her long-term companion, Flora Murray (1869–1923), were perhaps the two British women physicians who became most “famous in wartime Britain” (231). As the war heated up, they disregarded War Office advice not to travel abroad, and on their own initiative converted a central hotel in Paris into a hospital. Unlike other women who set up voluntary hospitals during the war, the couple resolutely employed only women for every position, from physician to orderly. Both were deeply committed suffragists; Anderson was a niece of Millicent Fawcett, a leading suffragist whose National Union of Women’s Suffrage Societies adopted a less aggressive stance than Pankhurst’s Women’s Social and Political Union, which favored militant tactics to achieve their goals. When their central-Paris hospital proved successful, military officials asked them to set up a second such institution in France and then to return to England to run a military hospital in a converted London workhouse. Though this Endell Street Hospital was unabashedly a suffrage hospital, drawing its motto from the feminist adage “Deeds not Words,” it was financially supported by Royal Army Medical Corps. The all-female staff was regularly instructed that “you not only have to do a good job but you have to do a superior job ... You have got to do better”—in other words, that these women could not only do as good a job as the male professionals but could outdo them.

After reading Fara’s many stories celebrating the achievements of truly remarkable women, the reader is sure to be disheartened by the last 18 pages of the book—a section called “Citizens of Science in a Post-War World.” Although women’s contributions to the war were roundly praised at the end of the conflict, as unemployment rose in the postwar period, women were urged to stay at home so that men could find work. Fewer women had paid work in 1921 than in 1911. Most medical schools once again refused to admit women.

Fara begins her final chapter by referring to a poll taken by the Royal Society of London in 2010 celebrating the 350th anniversary of that institution’s foundation. Women scientists and historians, including Fara, were asked to identify the ten women who had the most influence on British science. The list includes astronomer Caroline Herschel; physical scientist and popularizer of science Mary Somerville; paleontologist Mary Anning; physician Elizabeth Garrett Anderson (mother of Louisa); physicist Hertha Ayrton; X-ray crystallographers Kathleen Lonsdale, Dorothy Hodgkin, and Rosalind Franklin; nutrition scientist Elsie Widdowson; and geneticist Anne McLaren. After calling them all exceptionally determined high achievers, Fara concludes the book with this unsettling sentence: “Before the First World War, suffragists could see what they were fighting against, but modern discrimination is elusive, insidious and stubbornly hard to eradicate.”

I would add to her sadly true conclusion what I found in a follow-up to a mention of the British medical journal the *Lancet* in chapter 13. I did not find the answer to my query, “Who was the first woman to publish in the *Lancet*,” but I did learn that the issue of February 10, 2018, included an article “Year of Reckoning for Women in Science,” whose opening paragraph heralded February 11, 2018, as the International Day of Women and Girls in Science, to be followed by “events...—around the world to highlight the important contributions of women to the advancement of science, empower women and girls to embark on a career in science, and discuss how to overcome the many obstacles that women may face in their pursuit of a scientific career.... Only by removing barriers that prevent women from advancing in science and by creating gender-inclusive workplace environments will women and girls succeed in fulfilling their aspirations and reach their full potential” ([https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(18\)30238-1/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(18)30238-1/fulltext)). *Plus ça change, plus c'est la meme chose?*

But to end on a more positive note, during the week prior to my reading the book, the winners of the prestigious Kavli Prize for Nanoscience, often considered a precursor to the Nobel Prize, were announced. All were cited for the contributions to the invention of “CRISPR-Cas9” (<http://kavliprize.org/prizes-and-laureates/prizes/2018-kavli-prize-nanoscience>). Two of the three were women: Emmanuelle Charpentier and Jennifer A. Doudna. One step backward, two steps forward?