

REVIEWS

INEQUALITIES

Removing Barriers: Women in Academic Science, Technology, Engineering, and Mathematics, edited by **Jill M. Bystydzienski** and **Sharon R. Bird**. Bloomington, IN: Indiana University Press, 2006. 360pp. \$29.95 paper. ISBN: 9780253218179.

HENRY ETZKOWITZ
Newcastle University

Removing Barriers provides a series of snapshots on how far women have come in the engineering sciences in the U.S. and the distance that remains to achieve equity and equality. The volume depicts the distance traveled from the late nineteenth century when anomalous women pursued engineering careers. Female engineers organized themselves into the Society of Women Engineers and were supported by broader organizations such as the American Association of University Women. These groups played an important role in creating awards recognizing women's achievements and in publicizing role models to inspire the next generation. Individuals, like Betty Vetter, who created organizational mechanisms to track participation of women in science and engineering, although not well known, played an important part in building momentum for change.

The authors show how bottom up initiatives to support women in science were furthered by the broader women's and civil rights movements that provided the impetus for federal legislation, notably the Civil Rights Act of 1964, which opened new doors. Corporate employers of large numbers of engineers, especially those with military contracts, foregrounded their few female engineers as role models in advertisements designed to recruit new hires. Other federal initiatives, including those not specially directed at improving the condition of women, had important side effects. Thus, the Morrill Act of 1861 established the Land Grant colleges, open to women. This included MIT, which originated as a land grant school, although it

lost state support in the early twentieth century. Nevertheless, land grant status gave women a foothold at MIT, approximately 20 students a year, in an era when they were completely excluded from many other engineering schools that viewed themselves as male preserves.

The authors argue that when there is a will to change, a relatively simple modification can have a significant effect. Thus, when the Carnegie Mellon University (CMU) computer science faculty changed the entry requirements to reduce the emphasis on previous software experience, they found that they attracted a higher proportion of women. On the other hand, when implicit biases are left unattended they will continue to work against women, without their awareness of the situation except in the result of relative lack of women. For example, in a recent hiring committee meeting, a female noted that she was expecting a non-academic job offer; this was taken by a senior male committee member as representing lack of commitment to academia and sufficient grounds for excluding her from further consideration. If a male candidate had said the same thing, it would likely have been received as an indication of his having many options and may have improved his standing.

The themes presented in the book suggest that having to prove oneself by performing at a higher level than male peers is still a commonplace experience for women in science (earlier called the "Marie Curie" phenomenon after the Polish/French Nobel physicist, whose achievements were often credited to her husband even after his death). Reluctant acceptance of women's achievements is also a likely explanation for the finding that women tend to write fewer, but more extensive and carefully documented, papers. As women's participation rises, it may be expected that the Marie Curie phenomenon, and the psychological barrier of impossibly high achievement that it has been said to induce, will decline. As for publication style, it can only be hoped that the movement toward consideration of a smaller set of publications for hiring and promotion, rather than

simply counting papers, will make the female style the norm.

The issues of women and minorities in science are increasingly considered to be separate topics with different dynamics. Nevertheless, the volume is noteworthy for including research on African and African-American science students since there is much that can be learned from a comparative approach to analyzing underrepresented populations in science. For example, the role of family in promoting strong vocational interests among African-American women appears to be important to their success in science. Parents' encouragement of white women has also been noted to be helpful to their not being deterred by barriers. Strengthening one's identity by banding together as a minority with fellow group members, or wearing national dress, has been found to be helpful to achieving the strength to persevere as an individual and as a scientist.

Removing Barriers is also notable for bringing together insights from the two major perspectives in the field: the gendered nature of science itself and its effects on women and issues of inclusion and rise within the sciences—science in women and women in science. Of course the two are interrelated. General scientific concepts that incorporate characteristics of one gender will inevitably tend to exclude members of the other gender. On the other hand, rising participation of women in science and engineering makes it more likely that such implicit biases will be challenged.

Sex Segregation and Inequality in the Modern Labour Market, by **Jude Browne**. Bristol, UK: The Policy Press, 2006. 200pp. \$99.00 cloth. ISBN: 1861345992.

MATT L. HUFFMAN
University of California, Irvine
 mbuffman@uci.edu

Despite its sweeping title, Browne's *Sex Segregation and Inequality in the Modern Labour Market* is a case study of sex segregation and wage inequality at one large publicly owned organization: the British Broadcasting Corporation (BBC). How tightly linked are segregation and inequality in this large organization? How do BBC employees

account for the existence of segregation and gender inequality? The book offers a multi-method approach to important questions about the gender division of labor in this organization, and the effectiveness of current policies and practices to address it.

The book opens with a description of the BBC's organizational structure, gender composition, and labor market context. Additionally, Browne makes the important distinction between horizontal and vertical segregation—the former does not imply pay inequality while the latter does. Browne goes to great lengths to hammer home this distinction—which she returns to in the empirical chapters—by offering several examples from previous research in which this distinction is either not attended to, or confused. The distinction between horizontal and vertical segregation is important, and the examples will probably be beneficial to readers encountering it for the first time. However, readers who are at least somewhat conversant with the segregation literature might find the examples to be slightly belabored as I did.

The following brief chapter does a reasonably good job of outlining the major explanations of vertical sex segregation, although it reads much like a chapter in an advanced undergraduate textbook on gender inequality. Then, Browne presents her first empirical chapter, which she describes as a "large and detailed empirical investigation of occupational sex segregation in the BBC" (p. 49). Indeed, analyses are based on the over 19,000 full-time workers employed by the BBC. Importantly, however, the data comprise the number of male and female employees in each of 79 jobs categories and the 12 pay grades that make up the BBC pay grade system. Clearly, this limits the extent to which Browne can deliver on her promise of a detailed empirical investigation of vertical sex segregation. The count data are sufficient for describing general segregation patterns; however, they are quite weak where vertical segregation—which links segregation with wage inequality—is concerned. For example, one analysis correlates the mean pay grade for each job category with the percentage of females in the job. Sure enough, the mean pay grade increases with the percentage male in the job. However, Browne finds two other results "markedly encouraging." Female-