



Marie Hicks. *Programmed Inequality: How Britain Discarded Women Technologists and Lost Its Edge in Computing.* History of Computing Series. Cambridge: MIT Press, 2017. 352 pp. \$40.00, cloth, ISBN 978-0-262-03554-5.

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Published on H-Sci-Med-Tech (February, 2019)

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The term “revolution” implies a dramatic change to an existing social order. Marie Hicks’s award-winning first book, *Programmed Inequality: How Britain Discarded Women Technologists and Lost Its Edge in Computing*, argues convincingly that no such change occurred during Britain’s computer revolution in the second half of the twentieth century. Instead, in the two decades leading up to the 1970s, an emerging class of technocrats used digital computing technology and the rhetoric of revolution to, if anything, preserve rather than modify this influence, as captured in heteronormative ideals about women’s roles in society. Such conservatism locked a generation of skilled women technologists out of emerging professional roles that matched their level of expertise, a stonewall that exposed Britain to a self-made labor shortage amid escalating competition from the United States and evolving computing needs domestically. This failure to productively integrate women technologists into industry and government cost Britain its early lead in digital computing and, consequently, its stature in the postindustrial global information economy.

Programmed Inequality builds on a growing body of scholarship that explores the social history of computing. In his article “Power to the Peo-

ple: Toward a Social History of Computing,” Nathan Ensmenger calls on the field to restore human agency in the stories told about computing’s past.[1] Ensmenger argues that a fixation on engineering firsts, often told with a narrow focus on “great men,” had rendered the contributions of other relevant actors and social groups invisible. These histories had isolated the field from related disciplines and professions. Ensmenger instead advocates for the use of new theoretical and historiographical approaches as a means to recognize the overlooked contributions of technicians who had shaped the field’s trajectory. A change in course would make the discipline more engaging and relevant to other readers while also addressing gaps in the field’s historiography.

Hicks’s book, in five core chapters, shows precisely what such histories could be. A short introduction suitable for new readers to the field is followed by an opening chapter establishing that the exploitation of women technologists during the postwar period was nothing new. From 1930 to 1946, thousands of women computer laborers contributed actively, if also invisibly, to mission-critical cryptographic campaigns for the British military. Historians’ canonical association of computing with male genius, they note, had portrayed these women’s work as equivalent to automation,

an unmerited bias that extends far before the twentieth century. *Programmed Inequality* corrects course by demonstrating that no level of individual genius, neither male nor female, could have decrypted German code during World War II. Successful intervention necessitated a network of contributors, the majority of whom were—Hicks lets the record show—women whose collective intellectual toil made the stubborn potential of the Colossus computers real. New interviews with participants lend substance to this recalibration, including experiences that had not been made public due to wartime secrecy and postwar paranoia.

Chapter 2 introduces how women's expertise in computing was used against them in Britain's crippled postwar economy (1946-55) by managers seeking to justify that group's relegation to "sub-clerical" status. This campaign of displacement, which Hicks characterizes as "the Mechanical Ceiling" (p. 70), cost workers promotions, equal pay, and other measures of social equality. It involved multiple exclusionary tactics, including biased hiring rubrics, coded management language, denial of access to pension benefits, and sexist advertising (many examples of which are included in the book). One result was that mediocre job prospects became a self-fulfilling prophecy for women technologists, regardless of their skill. That talented women technologists were habitually fired upon marriage while the country simultaneously struggled to fill a labor shortage in that area is but one example of the extent to which the cultural status quo played out in place of a revolution.

In chapter 3, which chronicles the years between 1955 and 1967, Hicks illustrates how the rising cost and improved functionality of digital computers shifted industry and government thought about who should master such machines. Rising optimism, epitomized in a call for a "white-hot" technological revolution in 1964 by the prime minister, Harold Wilson, served to legitimize

higher pay for computer workers by raising the status of programming work, an upward move that attracted executive-level men into the field. At the same time, the spread of sexist advertisements about women's role in computing systems ridiculed and thus diminished the value of their labor in computing. Both trends reduced women's chances of upward mobility by crafting, and then perpetuating, the image of new high-status computing jobs as inherently masculine. Chapter 3 deconstructs this myth by demonstrating how it propagated. The reader learns of various counterexamples through the experiences of technologists like Ann Sayce and Mary Coombs from J. Lyons & Co.; Cathy Gillespie at the government's post office computing center (whose photo appears on the cover of the text); and Mary Lee Berners-Lee, mother of Tim Berners-Lee (founder of the World Wide Web), at Ferranti Computers.

Chapter 4 concerns how women technologists were kept out of management-level positions between 1965 and 1969 by, among other factors, the emergence of a body of technically minded male managers who fashioned themselves as a technocratic elite intent on computerizing the state. The concluding chapter introduces how exclusionary processes intersected with the government's desire to orchestrate Britain using a highly centralized model of computer-enabled control. In the push for centralization, spurred on by this wish for control, Britain's eclectic computing industry was whittled down and consolidated to the point of collapse as foreign competitors, such as IBM, capitalized on the evermore homogeneous market offerings in Britain. Per *Programmed Inequality's* subtitle, Britain then "lost its edge" in computing.

My review is being published over a year since *Programmed Inequality* was first published. Since that time, the book has won the 2018 Sally Hacker Prize from the Society for the History of Technology. That prize honors "exceptional scholarship that reaches beyond the academy toward a broad audience." [2] Seeing as the book has al-

ready attracted a great deal of comment since publication, I thought it might be worthwhile to cover some of it here, as it provides further interesting context for potential readers. Reviewers of *Programmed Inequality* have emphasized Hicks's contribution to the history of gender and computing. Janet Abbate, who helped to pioneer the field, praises Hicks's "important and challenging addition" to "a generation of solid scholarship" on the topic.[3] In a rigorous survey of that topic's historiography, Kate M. Miltner focuses on how Hicks's research expanded on pioneering contributions by Sadie Plant, Jennifer Light, Ensmenger, and Abbate.[4]

Other reviews have attempted to position Hicks's book as a contribution to "women's history," a framing that Hicks has firmly refused.[5] Under a section titled "Gender, Not Women, as a Category of Historical Analysis," Hicks explains that the lens of women's history is destined to fail to produce meaningful new discoveries in the history of computing because of the nature of the work that had been undertaken (p. 231). "A focus on individual voices tends to reproduce the narrative structures and historiographical methods that erased the impact of gender from the history of computing in the first place," the author summarizes, "positioning most women as too low level, peripheral, or anonymous to be a valid, formative part of computer history. The majority of these workers cannot speak through the archives as individuals, only as a group, and the explanatory power of their experiences lies in this realization" (p. 234).

In addition to being a valuable contribution to the history of computing and gender, *Programmed Inequality* should also be recognized as an important addition to the history of computing and bureaucracy, along with Jon Agar's *The Government Machine: A Revolutionary History of the Computer* (2003). Agar details a perceived isomorphism between the functionality of a human bureaucracy and that of an electronic digital com-

puter. Both systems processed large quantities of information using a hierarchy of pre-set but adaptable rules. *Programmed Inequality* adds to this line of inquiry a history of bureaucracy and gender. Hicks's account reveals how visions of achieving meritocracy in mid-century Britain were displaced by deep-rooted ideals around gender and the failure of technology to create social change. Meritocracy is revealed to the reader as a deeply conservative proposition.

Programmed Inequality has reached well beyond a purely academic base. The book has been profiled by *Forbes*, *The Guardian*, and *Wall Street Journal*. One would hope that given this reception, it will likely become increasingly difficult for contemporary leaders to advocate for more women to join the field of computing without also advocating for structural change to account for historic systematic bias. The reader can follow Hicks on Twitter at @histoftech and *Programmed Inequality* at @proginequality.

Notes

[1]. Nathan Ensmenger, "Power to the People: Toward a Social History of Computing," *IEEE Annals of the History of Computing* 26, no. 1 (January 2004): 96-95, <https://doi.org/10.1109/MAHC.2004.1278876>.

[2]. "The Sally Hacker Prize," Society for the History of Technology, n.d., <https://www.historyoftechnology.org/about-us/awards-prizes-and-grants/the-sally-hacker-prize/>.

[3]. Janet Abbate and Elinor Carmi, "Reviews of Programmed Inequality: How Britain Discarded Women Technologists and Lost Its Edge in Computing and Halt and Catch Fire," *IEEE Annals of the History of Computing* 39, no. 4 (October 2017): 9, <https://doi.org/10.1109/MAHC.2018.1221050>.

[4]. Kate M. Miltner, "Girls Who Coded: Gender in Twentieth Century U.K. and U.S. Computing," *Science, Technology, & Human Values* 44, no. 1 (May 7, 2018): 161-76, <https://doi.org/>

10.1177/0162243918770287; Sadie Plant, *Zeros and Ones: Digital Women and the New Technoculture* (New York: Fourth Estate, 1997); Jennifer Light, "When Computers Were Women," *Technology and Culture* 40, no. 3 (1999): 455-83; Nathan Ensmenger, *The Computer Boys Take Over: Computers, Programmers, and the Politics of Technical Expertise* (Boston: MIT Press, 2010); and Janet Abbate, *Recoding Gender: Women's Changing Participation in Computing* (Boston: MIT Press, 2012).

[5]. Mark J. Crowley, "Programmed Inequality: How Britain Discarded Women Technologists and Lost Its Edge in Computing," by Marie Hicks, *History* 103, no. 357 (October 2018): 693, <https://doi.org/10.1111/1468-229X.12660>.

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Citation: Jonnie Penn. Review of Hicks, Marie. *Programmed Inequality: How Britain Discarded Women Technologists and Lost Its Edge in Computing*. H-Sci-Med-Tech, H-Net Reviews. February, 2019.

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