Hidden Computers

Mention the word “computer,” and most people conjure up the same image: a machine designed to turn binary code into LaTeX documents and Facebook feeds. But in the 19th and early 20th centuries, the word would have evoked a very different image: a person employed to perform calculations. Even more intriguingly, this computer was likely to be a woman.

One of the first places where female computers rose to prominence was in the Harvard College Observatory, where celebrated astronomer Edward Charles Pickering recruited a team of women to perform astronomical calculations, likely because he could pay them far less than he would have had to pay men. The first female computer in Pickering’s lab was his former maid, Williamina Fleming, who began at the HCO in 1881. In the 1940s, the US Army followed in Pickering’s footsteps, hiring dozens of female “ballistics computers” to perform calculations to improve the field weapon accuracy.

Female computers were recently featured on the big screen in Hidden Figures, based on Margot Lee Shetterly’s book about three African-American women who worked as computers at NASA during the early years of the space race. Katherine Johnson, Dorothy Vaughan, and Mary Jackson contributed significant work to the calculations of Alan Shepard’s and John Glenn’s orbital flights around the Earth.

In all these fields, female computers were assigned to perform calculations that required a high level of accuracy and mathematical skill even when repeated for the hundredth time that day. Many laboratory directors actually felt that women were ideal for this work—even though the reasons were somewhat less than complimentary. It was commonly believed that women, even those with strong mathematical talents, were less intelligent than men and therefore didn’t grow bored with repetitive work as quickly.

That belief hints at a common thread among the careers of the female computers: male scientists often felt that computing work was “mere” calculation, rather than a valuable contribution to science. It was also rare for a computer to be promoted to another area of her laboratory or receive public acknowledgment for important work. It was one thing to hire a woman to perform mathematical calculations; it was another entirely to have her as a coauthor on a scientific paper.

Some computers managed to make names for themselves in scientific research. Fleming’s group at the HCO later expanded to include Henrietta Swan Leavitt and Annie Jump Cannon, both of whom made important contributions to our understanding of how to classify stars. Johnson, Vaughan, and Jackson went on to long careers at NASA. However, many other computers found that their path in science began and ended with repetitive calculating work. Opportunities for women were available, but they were far from infinite.

Shetterly’s title Hidden Figures is, unfortunately, an evocative one. All too often, female computers were written out of scientific and historical narratives. Highlighting the work of these early “computers” provides a fuller picture of the work that led to major scientific advances—and all the people who contributed to those achievements.

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