Complexities: Women in Mathematics. Edited by Bettye Anne Case and Anne M. Leggett. Princeton University Press, Princeton, NJ, 2005, xix + 412 pp., ISBN 0-691-11462-5, $35.

Reviewed by **Shandelle M. Henson**

I was born in 1964 in southeastern Tennessee. We lived out in the country on a small isolated farm with lots of books but no television. My parents talked about ideas and the outdoors rather than people and current events. They did not discuss a person's worth or abilities in terms of physical characteristics such as race and gender, or use labels of categorical contempt. They did not talk much about the facts of racial or gender discrimination, both of which were big news at the time. As a young girl I was astonished to learn that there had been racial segregation in Chattanooga. My father, a white man, told me how he used the "colored" establishments and facilities in order to demonstrate his opposition to that system. To Dad, this was of course the very recent past; but to a child, those unbelievably stupid and scandalous times were ancient history from a faraway city. My insulated world was surprisingly free of prejudice and the knowledge of prejudice.

I attended a local church school in the 1970s. It was rather homogeneously white, with only one or two minorities in each class, but our curriculum emphasized diversity and treating everyone the same. I accepted this as self-evident, having no idea that the approach was new in the textbooks. Until seventh grade, my teachers were middle-aged women ("old ladies," I thought) who made a point of encouraging the girls, as well as the boys, to think about careers. Again, I accepted this as obvious; it never occurred to me that anyone would think women should not pursue careers.

All of my mathematics and science teachers, from seventh grade through the Ph.D., were males. Most of them actively encouraged me in my career goals, and all of them treated me with respect. I liked most of them and idolized several of them. I never wondered why they were all male, and I never felt the need for a female role model.

I continued to live at home through college. I studied hard and spent an enormous amount of time alone exploring mathematical patterns, basically remaining in the insulated environment in which I had grown up. I was not ignorant of history, but unenlightenment seemed long ago or far away. It wasn't until graduate school that I began to detect a meaner side to the present society. It took me by surprise when my Native American officemate mentioned something about prejudice against Native Americans. Bless her, she simply told me how it was and took no offense at my profound ignorance. I was shocked when we heard rumors that a professor had asked a female graduate student whether her husband wrote her dissertation, and incredulous when I heard that one of the professors on my prelim committee had once said women could not do mathematics. Someone once wrote, "Rudeness is always surprising." To me, so was prejudice.

I went on to a postdoc and then my first job. I did not expect any discrimination against me as a woman, and I did not perceive any. I had no interest in women's groups at mathematics conferences and felt no special need to network with women; general talk of prejudice against women in mathematics seemed old-fashioned and irrelevant. In fact, I saw feminism as aggressive and disagreeable, as I (wrongly) equated it with the "gender theorists" of the 1980s who maintained that mathematics is done in a male-oriented way. Spare abstraction, deep structure, clean logic, and conclusive proof were, in fact, what drew me to mathematics—this was the way my mind worked—and I was offended that other women academics would suggest that it was a "masculine" way of thinking.

This was my experience. Was I naive? Unobservant? Insensitive? Self-confident? Arrogant? Lucky? Yes to all, but mostly lucky. First, I was blessed to have parents and grade school teachers who taught me to feel good about myself and others. I grew up in a world they created out of their own visions of what society should be like. It was a good world, a color-blind and gender-blind world in the best sense, where people acted with gracious civility and respect toward all. Although it was not the "real" world, I think it was a healthy place to begin life. Second, as I now realize, I was extremely fortunate that so many activist women came just a few years ahead of me and smoothed my way so effectively that I was able consider their continued efforts "irrelevant"!

The book *Complexities: Women in Mathematics*, which contains the stories and insights of more than eighty female mathematicians, gave me a lot to think about. Reading some of these stories was a humbling and painful experience. Vivienne Malone Mayes could not become a TA because she was black, could not enroll in a certain professor's class because he didn't teach blacks or believe in educating women, and could not join her colleagues talking shop in the local cafe because it didn't serve blacks. Elayne Arrington-Idowu could not be an angel in school plays because she was black, her high school had no valedictorian the year she graduated first in her class, and her Mesta Machine Company Scholarship was revoked by the company because she was a woman. Dorothy Bernstein's (oral) prelims lasted four times as long as her peers' because she was a woman and from the Midwest. These things happened not so long ago, really.

The book is factual and upbeat. Many contributors simply relate the stories of why and how they became mathematicians, and they do so with grace, generosity, and humor. Some of the stories have little or nothing to do with discrimination or obstacles. The book is loosely organized into five parts, each of which contains chapters of short essays addressing a wide variety of topics. Part I consists of two chapters of historical essays on some of the well-known nineteenth- and twentieth-century female mathematicians, including Sonia Kowalevski, Julia Robinson, and Emmy Noether. The essays in Part II chart the founding and growth of the Association for Women in Mathematics (AWM) and other organizational milestones for women in mathematics. Part III contains four chapters of essays on the choices and challenges that women face in mathematics. For example, Lynne Butler discusses the balance of research, teaching, and service at a liberal arts college, Neal Koblitz writes about student evaluations of female professors, and several authors discuss their careers in industry. The chapter "A Dual Triumph" addresses the challenges of being black and female in the mathematical community. Other essays concern such challenges as the two-body problem and having children while on tenure track. Part IV celebrates specific mathematical problems. The final part of the book consists of essays written by young female mathematicians, looking to the future.

The reader should understand that the book is not meant to be an exhaustive accounting of all current or recent female mathematicians, or necessarily a spotlight on the most productive. It focuses to a large degree on the stories of women who have been involved in AWM. Only a small fraction of the many well-known and highly productive female research mathematicians are mentioned.

Mathematicians should read this book for at least four reasons. First, it gives a sense of recent history and context to those of us who were born in the 1960s or later. Many of us had it easy thanks to those women and minorities who came just a decade or two before us, and we should have the humility and appreciation to celebrate and honor them. Second, the stories remind us that some people still face circumstances that discourage them from pursuing mathematics. As mentors, we can take substantive steps

to alleviate the isolation felt by some in our classrooms. Third, we need to face the prejudices and generalizations that insidiously infect each of us over the years, whether or not we were raised to be prejudiced. These ideas subtly (or not so subtly) affect the way we relate to individual students. Finally, we need to reflect on the fact that social progress and civility are fragile and can quickly reverse in certain climates, especially during times of national crisis and social instability. We need to keep educating ourselves and every new generation in the equality and worth of all human beings, no matter how much progress we think our society has made.

My university has a 33% minority enrollment, and in the mathematics department two-fifths of the regular faculty and more than half the undergraduate majors are women. Many of these young women students are passionate about mathematics. They throw epsilons and deltas around with complete confidence and unapologetically tutor their boyfriends in math and physics. Last school year, most of my top incoming calculus students were African-American women. They weren't just good students; they demonstrated genuine talent for abstract thought, doing the kind of work that makes a professor start thinking "Ph.D. material." Nevertheless, it is clear to me that some young women, for various reasons, do not have the confidence that I had and need a female role model and extra encouragement. I work hard to mentor them, and I derive great satisfaction from introducing them into my network of colleagues and watching them gain confidence and succeed.

As I watch some of my women and minority students excel, I am proud, but I feel no sense of surprise. It seems right and natural, like reentering the real world after having awakened from a visit to a distorted dream world. It is what I fully expect to see. Deep down, I am still my parents' child. I want to take the opportunity to thank them, along with the teachers and mentors who encouraged me, and the women of the preceding generation whose stories are told in this book.

Andrews University, Berrien Springs, MI 49104
henson@andrews.edu