The Continuing Struggle for Equity as Women in Mathematics

From the panel "Women's Role in Mathematics"

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Lynne H. Walling

Let me begin by telling you a bit about myself. I did not intend to become a mathematician. I was raised to believe women and men are equal, and that all doors were open to me. Still, it was the ambitions that my teachers set for me that led me here, and the determination of my friends that kept me here in the face of active, terrifying resentment from a few.

My first year in college disappointed me; except for Calculus and a graduate level course in literature, my courses were far less challenging and intersting than those I had in high school. I quit college, making my mother cry. After two years of working low-paid, intensely boring jobs, I returned to (a different) college as an Accounting major. I picked up Math as a second major, just for fun. The math kept getting more intriguing, so I decided to pursue a Master's degree in math, then get a "real" job in accounting (which I found boring, but offered a surfeit of well-paid jobs).

One of my math teachers, Bill Barnier (topologist), eventually convinced me to apply to Dartmouth College, despite my fear of its students' wealth. He also told me that some schools, like Dartmouth, don't have Master's programs, although they award Master's degrees. So he convinced me I needed to apply as a doctoral candidate, and I could simply stop after the Master's degree if I was so determined. (Clever ploy!)

Once at Dartmouth, I almost quit during my first year. Having an insufficient background for the course, I could not understand algebraic topology. Since I, the only female in the course, asked questions, the professor treated me as stupid. I stopped asking question during class, then asked the male students afterwards; they also didn't understand the course, despite their sage nods during lecture. Especially since I knew other math professors there believed I was a strong student, I refused to give those boys the satisfaction of my quitting.

One of those professors who believed in me was Tom Shemanske, who became my doctoral advisor. And the first paper he gave me to read was by a woman: Winnie Li. Tom's goals and expectations of me were beyond my own, but I so cherished his belief in me that I dare not disappoint him. As his student, he told me something that terrified me: If I got an idea for a thesis, take a month to check it out. I did get an idea, and it became my thesis.

Thinking I might never have another idea, I didn't apply for research jobs, which I could tell made Tom angry. Looking back, I can now see that he was angry because he

felt I underestimated myself. After a few boring years at small colleges, during which time I worked on research with Tom and on my own, I applied for 50 research jobs. I got only one interview, but I only needed that one job.

Around this time I was invited by Bill Duke to give a talk at Rutgers University. My visit to Rutgers was very powerful, for several reasons. First, I was scared but honored that Bill thought enough of my research to invite me. Then, Henryk Iwaniec had several impressive mathematicians currently visiting, such as Brian Conrey, Carl Pomerance, Andrew Granville, Amit Ghosh. These people treated me as though I belonged there. Later, Bill and Henryk took me to IAS in Princeton. Walking in the woods, Henryk said to me, "When you get a sabbatical, you should consider coming here for a year." All this changed what I thought was possible for me.

A few years later when I was up for tenure at my university, I faced horrors. I had to hire a lawyer to make them follow their own rules. So often I thought of quitting, except I was so in love with math. My advisor and other friends, especially Jeff Stopple (number theorist), were so supportive, determined I not quit, that I made it through that nightmarish time. Now I've been elected chair of my department, with the support of those who initiated and propagated the horrors.

A few year ago I worked for two years as a Program Officer at the National Science Foundation. This was another powerful experience, requiring me to stretch beyond what I thought were my limits. Once again, the people I was around treated me as though I belonged. My research program suffered because of this demanding job, but my belief that I do belong in this profession has strengthened.

My mentors and role models have dramatically changed what I have thought possible for me.

Now let me turn to the question at hand. When asked to comment on women's role in mathematics, one word sprang to mind: unfulfilled. Although more women have entered this profession over the decades, we still face barriers as subtle as condescending and patronizing attitudes, to as blatant as harassment and abuse. We do not need to justify or defend our knowledge that women belong in mathematics and should be treated as equals. The first step toward this is that we accept as an axiom that our qualifications entitle us to be equal.

There are theories that women think differently, and some argue that this means women contribute in different ways. But to assert that women can all be characterized by the same adjectives is narrow-minded and foolish. While some people share similar characteristics, we are all individuals, with our own sets of strengths, desires, and needs. To have a strong, inclusive community we must recognize this and support the goals that each person sets for him or herself.

Having said that, let me remark that too often women do not set for themselves goals that meet their talents. Women who are ambitious and confident are often spoken of derisively. Many feel free to comment on a woman's physical appearance when describing the woman's professional accomplishments, asserting that "attractive" women cannot be strong mathematicians, and "unattractive" women are not worthy of consideration. Such messages are so constantly broadcast that they become part of the white noise our conscious minds filter out. However, these messages are heard by our subconscious minds, and often result in lowered expectations of ourselves.

To combat this, it is critical that we not remain isolated from other women, that we do not apologize for being women, and that we have role models. We need to look to each other to find these role models, which means that each of us must recognize that others look to us in search of role models. This does not mean we should present ourselves as perfect; we need to present ourselves as human. We need to encourage other women to fully utilize their talents, and to set goals that match their talents. Then we need to support them when they face discouragement and harassment.

Our own fights to gain our places in the mathematics community may have been hard, even horrifying. The next generation of women will face somewhat different struggles, but this does not mean they will not struggle. We must feel pride, not resentment, when barriers we faced are no longer put before the next generations.

Any struggle to achieve and maintain equality is difficult and lengthy, and never really over. For each step of progress we must celebrate, gratefully acknowledging those who have assisted us. But the celebrations must be used to renew our energy and to redouble our efforts in this struggle. We cannot stop short of equality, and once there, we must be vigilant to retain our hard-won status.

Such a struggle takes a vast amount of energy. Effectively pursuing the goal of equality requires that many of us join together, sharing our energy as we share the burden. We need to have enough women in this struggle, each of us shouldering enough of the burden, that each of us can also pursue our research careers and our personal lives.

We must not think only of whether our own personal situations are acceptable. We are part of a community; further, we are stewards of the future, guardians of the next generation of women mathematicians. We must pass to them, without rancor, the knowledge and the advancements we've made.

We must reach as high as we can, the reach back and lift up those coming up behind us.