Talk back

Location, location, location

In Paul Massari's article "Happy Trails" from the June 2005 issue, his first sentence refers to visiting the "fabled glass flowers" at the Peabody Museum. The Peabody Museum is a fantastic museum of anthropology and archaeology with incredible artifacts from all over the world, but those artifacts do not actually include the glass flowers.

The glass flowers are in the Harvard Museum of Natural History (HMNH), which is connected to the Peabody, such that visitors to the Peabody get a two-for-one admission to the HMNH, and, similarly, visitors to the HMNH get admission to the Peabody. This has sometimes caused confusion between the museums, and I can understand why Mr. Massari may have thought that the Peabody housed the flowers.

As a member of the Education Department at the HMNH, I have had the wonderful opportunity to both learn and teach about the glass flowers and their fascinating history over the past three and a half years. We offer Glass Flower tours to groups from all over the world, and have hosted foreign dignitaries who have come here specifically to see them. They are well worth a visit (as the Harvard Forest most certainly is, as Mr. Massari was urging us), and on every weekend, there are trained gallery guides volunteering their time who can answer questions and bring the flowers and their history alive for all visitors.

Thanks for the chance to clarify the glass flowers location.

Lisa Maloney
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opinion

Understanding the dearth of women in science

By | **Maria Ong** | Contributor

Over the past 50 years, women have made tremendous strides in education and in professions in all fields, including science, mathematics, engineering and technology (SMET).

According to the National Science Foundation (NSF), in 2001, women made up 56 percent of all bachelor's degree recipients, though they comprised less than 45 percent of bachelor's recipients in the natural sciences and engineering. Within the latter category, women's representation approached or exceeded 50 percent in some fields (chemistry, mathematics, and biology) but hovered around 22 percent in others (physics, computer science and engineering).

Perhaps with the exception of biology, the further a woman travels along an academic path in science or engineering – graduate school, postdoc, faculty or other high-level positions – the less female company she is likely to have. Similar trends apply for underrepresented ethnic and racial minorities.

How do we explain a dearth of women at the advanced academic and professional levels in SMET? The past few months have witnessed a passionate dialogue about the barriers to success in science and engineering for women, including the question of their innate abilities. On average, American girls outperform boys in mathematics in elementary and middle school, and women's Ph.D. achievement in disciplines like physics varies from country to country. We would not see these phenomena if there were truly innate shortcomings among females. Unfortunately, many people subscribe to the "intrinsic aptitude" argument. If they work in SMET fields, they may convey these beliefs, intentionally or not, in their social interactions with female students or co-workers.

I place myself among the increasingly vocal ranks of gender scholars and female scientists who argue that *cultural factors* are mostly to blame for gender differences in representation in SMET.

For nearly 10 years, I have studied the lives, academic careers and communities of young women and minorities who aspire to become physicists. I have included in my research only students who have earned physics or physics-related bachelor's degrees and who usually have entered Ph.D. physics programs. What I have learned is that gender bias of decades past hasn't gone away. It's just gone underground.

In academic or work settings, women usually are no longer at risk of being flatly told by faculty or peers that they can't do physics because of their gender. Instead, female undergraduates often receive subtle cues that their belonging and competence are doubted: they aren't called on in class; they aren't looked in the eye when spoken to; when studying with male peers, they feel their answers aren't taken seriously; if they have a question about an intermediate step in a problem, their instructor condescendingly begins his explanation at the very beginning; they find themselves being the "only one" in upper division classes; and they lack female faculty mentors and role models.

At the graduate level, women have many similar experiences and, in some instances, they encounter more direct messages. For example, one woman was told by her adviser that her job on the research team was to "decorate the lab," while her male counterparts were given experiment-related tasks. Female graduate physics students also tend to think more about how they will balance family and career in the future; sadly, they find few role models among faculty.

These small instances of bias or difference – what sociologist Daniel Solórzano terms "microaggressions" – are difficult to name, to clearly associate with gender, and to correct at the individual or institutional levels. Many women spend a great amount of time trying to process and decode such encounters, then even more time worrying about whether, and how, to respond to them. Furthermore, these microaggressions have a cumulative effect that often eventually diminishes their confidence and turns many of them off of science. In my research, I have watched talented women grow jaded from their daily social and cultural interactions in the physics community. They go from asking themselves, "Can I do physics for a living?" to, "Why would I want to bother?"

The United States needs to recruit and retain more women, as well as more minorities, in SMET fields, especially as the demographic balance of college attendees shifts towards majority female and non-white populations. According to the NSF, the country's continued national security and its status as a world scientific leader depends upon its abilities to attract top students from the domestic population into SMET careers. Institutions that educate and employ scientists and engineers, therefore, must accept the responsibility of reforming social and cultural practices in these disciplines to create a hospitable environment for a more diverse population.

Recently, the Task Force on Women in Science and Engineering at Harvard released recommendations toward these goals, including requiring pedagogical training with a gender bias component for doctoral students, mentoring for junior faculty, and developing a number of options for maternity leave and childcare. I applaud Harvard, as well as many other institutions around the country taking similar measures, for their serious and necessary efforts in increasing diversity and excellence in SMET. Δ

Maria (Mia) Ong, Ph.D., is an outgoing postdoctoral fellow and lecturer at the Graduate School of Education who studies social dynamics and pedagogy in physics and engineering. She served as a United States delegate for the 2nd IUPAP International Conference on Women in Physics (Rio de Janeiro, May 2005) and is the author of a forthcoming article in Social Problems, *"Body Projects of Young Women of Color in Physics: Intersections of Gender, Race, and Science."*

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