As a chess player, I have been acutely aware that chess clubs are almost exclusively a male domain. Therefore, I was not surprised to learn that 99 of the top 100 chess players in the world in 2012 were men. These statistics have led some to conclude that women simply aren’t very good at chess. The argument goes that maybe women can’t visualize tactical or strategic patterns the way men can; maybe their brains are wired differently. Yet studies have revealed that the percentage of women who reach the higher echelons of the game is completely consistent with the percentage of adult women who actually play. Strangely, the number of female chess players decreases as they advance from elementary school through adulthood.

The chess experience highlights another, and more significant, problem: the disproportionately low number of women in scientific and engineering careers. Recent statistics indicate that about half of doctorates in science and engineering in the USA go to women, yet women comprise only 21% of full professors in science and 5% in engineering. Even worse, women scientists are generally paid less than men and are much less likely to be promoted, serve on advisory boards or receive research grants. Furthermore, women who advance in the academic ranks tend to find themselves burdened with heavier teaching loads that take time away from bench research. It is therefore not surprising to learn that only 43 women have won Nobel Prizes out of 839 laureates. Could it be that women are simply not very good at engineering and science? This was a possibility posited by Lawrence Summers, the former President of Harvard University, when he hypothesized that women might have a “different availability of aptitude at the high end.” (Dr. Summers resigned following a vote of no confidence by Harvard faculty.) The data simply don’t bear this out.

While there may be several reasons why women drop out of science and engineering, the most significant factor is gender bias going all the way back to the Greek philosophers. It just wasn’t possible for women to receive the appropriate education or achieve the necessary status to engage in scientific study. Women who made great scientific advances only did so after
considerable struggle and were rarely given appropriate credit. The female winner of the 1947 Nobel Prize for chemistry, Dr. Gerty Cori, was an unpaid lab assistant. And Dr. Rosalind Franklin, who played an instrumental role in discovering the structure of DNA, was not recognized for her contributions and completely overshadowed by the men who used her data, Drs. James Watson and Frances Crick.

While the examples above are historical in nature, recent studies indicate that gender bias continues to be a pervasive obstacle. A study of several different science prizes (other than the Nobel) revealed that men were more likely to head prestigious research award panels and women were statistically less likely to win awards from male-dominated award panels versus women-dominated award panels. More recently, a study by microbiologist Jo Handelsman at Yale University raised alarming questions about the continued pervasiveness of gender bias. Her research team asked 127 professors to rate one of two resumes. Half were given the resume of a male candidate and half the resume of a female candidate. The professors were significantly more likely to hire the male candidate and offer him a higher salary than the female candidate. Here’s the rub: The two resumes were identical except for the name at the top! Most surprisingly, this bias was the same regardless of whether the evaluating professors were men or women. These data are disturbing and force even the most well-intentioned senior scientists to reevaluate hidden biases as they make key decisions in junior scientists’ careers, such as hiring and tenure decisions.

Fortunately, the situation for female scientists has been gradually improving in recent years. For example, the proportion of federal research grants going to women has increased from 24% in 2002 to 30% in 2012. There are also more female faculty members in academia. Since the departure of Lawrence Summers, Harvard University’s ratio of female faculty has increased from 22% in 2001 to approximately 25% today, an all-time high, with senior faculty accounting for most of the increase. Women are increasingly taking the helm of key panels and committees; Keystone Symposia’s own Board Chair, Dr. Juleen Zierath, is now Chair of the Nobel Committee for Physiology or Medicine. We have also observed a steady increase in female attendance at our conferences, and by putting some pressure on our conference organizers, we are close to ensuring that women at the podium reflect their general representation in their scientific fields. While there is a still a long way to go, the trend is in the right direction for society to tap the scientific talent that lies latent in the female population.

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