Sharyn Endow

Sharyn Endow was born in a small town in Oregon, to second-generation Japanese American parents. She earned a BA degree from Stanford University and went on to do her PhD at Yale University, where she was a student of Joe Gall. She was a postdoc at Cold Spring Harbor Laboratory and then in Edinburgh. She returned to the USA to take an Assistant Professor position at Duke University, where she has been ever since. She was promoted to Full Professor in 1992.

Sharyn has been working on molecular motors since the kinesin field was in its infancy.

In the interview that follows, Fiona Watt, Editor-in-Chief of JCS, asks Sharyn about her experiences as a woman in science.

FMW: *What changes for women in science have you observed during the course of your career?*

SAE: Things have not changed that much during my scientific lifetime, really. It is still, in the United States and many other parts of the world, a male-dominated society with all that this implies. There are still major problems in the way those with only one X chromosome perceive the abilities of those with two. Having said that, many of my friends in my field of research, molecular motors, are men. Several of them have gone out of their way to be helpful, being perhaps more receptive to me because I am a woman in this highly competitive, male-dominated field.

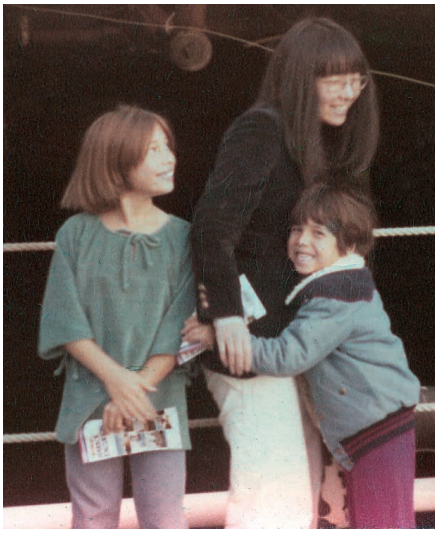
It is true that there are many more women in high academic and administrative scientific positions now than there were when I was a student. These women are truly exceptional individuals – many of them have families with children and older parents to care for. They are creative, highly intelligent, socially graceful and perceptive, forwarding-thinking people. But there are still not enough women in higher positions. Too many women are falling by the wayside for want of role models, support by others and many other reasons. Some women are reticent about letting others know that they need help at different points in their career, or are reluctant to accept help. And then there are those people who are in a position to support and promote women at all stages of their scientific careers, but who do not do so. They still believe that a qualified man is more deserving of promotion, nomination for special awards, pay raises, and so forth, than a well qualified woman. It is still surprising and shocking to me that these views are held not only by men at all levels, but also by *women*. There are prominent women in high academic positions who promote and support men at the expense of women. They may not realize or admit they are doing so, but it is apparent to everyone around them.

I think that it will require another generation or two before the view that women are as capable as men fully pervades our society and is generally accepted by everyone. Meanwhile, women scientists in my generation are still doing battle and clearing the minefields for those who will follow.

FMW: *How has your research career impacted on your personal life and vice versa?*

SAE: From the time that I was fifteen or so, I knew or decided that my life would be different from those of many around me. I wanted my life to be significant, to make an impact, even if it took most of my time and energy. And now I have been a scientist for so long that I have gotten used to not having time for many of my personal interests. I most regret not having more children around me, although I am not sure that I could ever have children of my own, as they require so much care!

I think that if I had not become a scientist, I would have done something in the food industry, either writing about food or preparing it. My brother was trained as a chef and I love talking with him about the philosophy of food and its preparation. Or perhaps I would have worked in the arts – my former roommate from my graduate student days at Yale is now in theatre in New York – she was in the drama program at Yale and her husband is a very talented but still struggling painter. I don't think that a career in science is necessarily prohibitive to having a personal life or outside interests, or that the extensive time commitment required to be successful is unique – other careers are exceedingly demanding, requiring long hours and a lot of travel.



Sharyn Endow with her niece and nephew

To a large extent, it is a matter of individual choice as to how much time one devotes to one's career versus personal life. This can also vary quite a lot during the course of one's career. There are certainly times when I have wondered whether choosing a career in scientific research was worth giving up so many of my outside interests. This has been especially true whenever a manuscript is returned without review or a grant proposal receives severe (but undeserved!) criticism from the panel. But I think that the deciding point always comes down to the fact that I really love doing the research and thinking about the problems. I'm not sure that there is another line of work that I would enjoy doing so much, day in and day out. And there's really nothing comparable to the thrill of discovering something new that others may not even have *thought* possible. My only hope is that when I retire and look back over the other career paths I could have taken, I will have no regrets about having chosen this one.

FMW: *Do you feel that being a woman is an inherent advantage/disadvantage for a career in science? Why?*

SAE: My view is that women are highly diverse people, as are men, and so it is wrong to generalize. Some women are more suited for a career in science than

others, and this is also true of men. A career in science today demands many talents: a depth of knowledge in a field, creativity, technical expertise, the facility to adapt new techniques, administrative ability, computer expertise, political adeptness, the ability to write well and quickly, and to teach and speak well. The demands continue to grow and change. It is not enough simply to be above the mean in IQ – I have seen highly intelligent people, both men and women, who fail to perform well in scientific research. I am not really sure why. Some can see too well the way experiments should work out and may not be able to reconcile themselves to imperfect biological systems; others get tied up in the small details of doing the experiments.

Some researchers whom I know would have been much better suited to being a scientist in the mid-19th century. In those days it was perhaps acceptable to spend the morning pursuing outdoor hobbies, the afternoon scrutinizing a new specimen under the microscope, and then round off the working day with afternoon tea. Eventually, after a year or two, one would send a thoroughly researched eighty-page manuscript to the publisher. These days have long passed and staying in the mainstream is exceedingly difficult for both men and women.

Perhaps women tend to be more adept at multi-tasking than men, which is an advantage for a research career. But today people still view the capabilities and roles of women as not equivalent to those of men; thus women have an inherent disadvantage that is ingrained in society, not in the different biology of men versus women. Given the enormous importance of science in society today, parents and teachers at all levels would do well to encourage children, both girls and boys, to excel in science and mathematics. As a society that encompasses the human race, we cannot afford to let more than 50% of the population sit by the wayside, not fully understanding or contributing to the advances that will come.

FMW: *What are your remaining career ambitions?*

SAE: A major question in the field of molecular motors is how motors convert chemical energy from nucleotide hydrolysis into work. I think that we now know enough about motor proteins to be able to solve this problem in the next 5-10 years. I would like to be a part of this. I feel that we are now on the verge of great discoveries, which will depend on a combination of biophysics, structural biology, and analysis of mutants. There are some very talented researchers in the field today. Most of them are men, but it is really encouraging to see that there are some outstanding, and a few brilliant, women who are entering or already working in the motors field. I look forward with great anticipation to the next few years and the exciting new scientific findings they will bring.

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