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## Biophysicist in Profile



Catherine Royer

Catherine Royer's life has been serendipitously intertwined with the Biophysical Society. She was born in Fort Wayne, Indiana in 1957, the year of the Biophysical Society's first Annual Meeting. Although her mother and father were chemists—her father later became an economist—she did not originally plan on a career in science, but rather in French Literature.

Royer spent her early childhood in Chicago, and moved to Peoria, Illinois, when she was 10 and lived there

until she was 18. During her junior and senior years in high school, Royer was involved in the American Field Service (AFS), a community-based organization that provides for international student exchange. Royer went to France, and quite literally fell in love with the people and the culture. While in the AFS at the age of 16, Royer met her future husband, where, as part of the exchange program, Royer stayed with a couple in the town of Versailles and was introduced to their nephew, *Patrick Royer*.

Upon graduation from Woodruff High School in 1975, Royer attended the University of Illinois for one year, majoring in French Literature. After her

first semester, however, she realized that her study of choice was not what she wanted to do. "I was bored," she said, "I had a lot of college friends in science and what they were studying seemed much more interesting to me." She then decided to return to France at the Université Pierre et Marie Curie to study chemistry and biology. Developing an interest into the fundamental aspects of chemistry, Royer switched majors and received her Diplômes d'Études Universitaires Générales (DEUG), or Diploma of General Higher Education in the Natural Sciences. She then took on the Chemistry/Biochemistry dual major (they are the same major in the French system) and received her License.

After graduation she left Paris and with her husband spent nine months hiking through Mexico and Guatemala. When the money ran out for the young chemist and cultural anthropologist, they settled down in Illinois. It was there that she received her doctorate at the University of Illinois at Urbana-Champaign in Biochemistry in 1985. Biophysics as a subdiscipline was quite strong at Illinois at the time.

While at Urbana, Royer met *Gregorio Weber*, her thesis advisor, who was the first Biophysical Society National Lecturer. "Working with Weber was amazing in all sorts of ways," she reflects, "He really taught us all to think deeply about proteins and interactions and dynamics." She also learned to enjoy fluorescence from an aesthetic point of view. "Gregorio told me that I had to like biophysics," she recalls, "and I do."

Weber also introduced her to the Biophysical Society, and took her to her first annual meeting in San Antonio, Texas in 1982. At that meeting Royer

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roomed with *Suzanne Scarlata*, another graduate student in Weber's lab. They have roomed together at every meeting except for four since then.

Scarlata recalls Royer's determination and persistence as a graduate student. Originally, Royer was told by the department chair that she could not join Weber's lab, but she kept at it until they let her in. Although the lab was dominated by men, Royer remained undaunted. "Cathy was actually motivated by them and she worked hard to show them up," says Scarlata, "the comments from guys kept coming but Cathy was very self-assured and didn't take them that seriously."

In 1986, Royer moved back to Paris to do her postdoc work at the Université de Paris VII in biophysics. She became a research associate through another exchange program with the Centre National de la Recherche Scientifique. With her advisors, *Bernard Alpert* from the Université de Paris VII and *Guy Herve* from CNRS, Royer studied the effects of ligation on the dynamic properties of two allosteric proteins.

The next year Royer returned to the US as a research physicist in the Laboratory of Fluorescence Dynamics (LFD) at the University of Illinois, Urbana-Champaign, and later became an adjunct assistant professor in the biochemistry department. While there, she and Scarlata collaborated on a project together. "Cathy was always able to get excited about her work and motivate others," Scarlata remembers, "...we had so much fun!"

After three years as the User Coordinator at the LFD, which included an independent research program,

Royer felt "she had the stamina to take on just about anything." Spending a lot of her time helping and counseling the users to the facility, Royer learned to do fluorescence on "all sorts of systems and [it] was very enriching intellectually."

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**"...the comments from guys kept coming but Cathy was very self-assured and didn't take them that seriously."**

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Feeling like it was time to concentrate on her own work, she applied for a tenure track assistant professor position at the University of Wisconsin. She was offered the position in the Pharmaceuticals Department, and was also able to build up her own research program while teaching through grants from NIH, NSF, and the Whitaker Foundation.

Scarlata remembers Royer always talking about returning to France, however, and Royer kept many ties to France long after leaving as a postdoc.

In 1996 Royer did return and spent one year as a visiting research director at the Center for Structural Biochemistry, a department associated with the INSERM (the French Institute of Health and Medical Research), the CNRS, and the University of Montpellier. During the year, she learned to use the atomic force microscope "with the help of our local AFM guru *Christian LeGrimellec*," and applied it to exploring protein-protein and protein-DNA interactions of the tryptophan repressor. In the spring of the following year she was offered a permanent position as an INSERM director of research, and in 2001 was named associate director of the department at the Center for Structural Biology.

Royer thoroughly enjoys her research, and loves when she looks at the computer screen as the results appear, and she gets that "A-ha!" feeling. She agrees that you should be a biophysicist only if you really like it. "Biophysics should be something that keeps you awake some nights," she explains, and compares the work in biophysics to being an artist or musician. "Biophysics requires creativity. One must have ideas and be ready to question his or her own worth and the direction to take." Her advice for international students is not so different. In fact, she says, "French students really should like it more because the pay is lower and the bureaucracy higher, but then again, the wine is better."

As an international member of the

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Biophysical Society, Royer would like to obtain a more representative amount of international

members at the annual meetings. While she is able to and looks forward to attending them every year, it is important to ensure that the number of symposia by international members reflects the 28% of the members who are international. Also, she would like to help out the international members by providing support groups and aid to those trying to find jobs and provide other assistance in their career paths.

In the meantime France affords Royer and her family a myriad of opportunities for a rich personal life in addition to her professional one. With her husband and two sons, Ian, 18, and Julien, 9, hiking in the Mediterranean back-country and in the Alps are all part of everyday life.