

APARNA HIGGINS

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Tell me about growing up in India.

My parents were of different religions. My father was a Hindu, and my mother was a Parsi. To me, this was an advantage because we celebrated the holidays for both religions, and we learnt to embrace (and not just tolerate) both religions. My parents married in 1957. They had met when my mother was a student in college and he was a professor at that college.

What did your parents do?

Both of my parents taught commerce (business) in college. My mother had a master's degree in both commerce and law. My father also had a master's degree in commerce and a bachelor's degree in law. Later my father left teaching to work in the corporate world.

Where did you go to school before the University of Bombay?

My parents were committed to sending me to the best schools possible, so I attended Queen Mary School from age 5 to 16. This was a Christian girls' school, thus introducing a third religion into my young life. There were about 600 students, very few of whom were Christian. I loved the school. It is interesting that so many non-Christian families sent their daughters to be educated by a Christian school. It had the reputation as one of the best girls' schools in Bombay (now Mumbai). However, they didn't try to convert the students, though they would have been happy with some converts. I worked hard in school.

My brother went to one of the best boys' schools in Bombay, Champion School, run by the Jesuits. My brother is five years younger than I am and is also well educated. He has devoted much of his life to caring for my parents.

When did you get interested in mathematics? What was the special attraction?

A first important general decision had to be made in the ninth grade. I chose science over business or a program in the arts and humanities. I studied all four subjects in science: physics, mathematics, chemistry and biology. Our school was strong in science and had good laboratories for biology, chemistry and physics. The Indian university system at the time required you to start off studying all four science subjects (biology, chemistry, mathematics, physics), and then to drop off one subject each year. Your major was the only subject you were studying in your senior year. In my junior year, there were only nine of us taking both mathematics and physics. In my senior year, I was the only one continuing with mathematics. My father, especially, encouraged me to make the

more unusual choices, whether it was choosing essay topics given some options, or choosing a major.

Did your parents influence your interest in mathematics? If yes, how?

They encouraged me to study science, and then later mathematics. My mother was the taskmaster. I was especially influenced by my high-school teacher Miss (Janet) Bingham and the books in the "Pattern and Power of Numbers" textbook series. In high school, I also competed in the NSTS, the National Science Talent Search. The process consisted of a written exam, a project, and an interview by a panel. My project was to find patterns satisfied by the squares to base 2. A Fellow of the (Indian) Society of Actuaries, N. M. Dongre, who was a former student of my father, gave me mathematics problems to ponder and generally encouraged me.

And then you went to the University of Bombay?

Yes. I went to the Institute of Science in Bombay. Being a National Science Talent Scholarship winner meant that I had to commit to a month at a summer program at other institutions in other states for each of three years. These were great experiences for me, including excellent networking. Many other students from these programs also went abroad for their doctoral studies. Those who were a year or two senior to us gave us good advice on which institutions in the U.S.A. took students from India directly after a Bachelor's degree, and which offered them assistantships. This helped us with decisions of where to apply so that we could spend our limited funds on application fees to institutions that would be more likely to accept us and provide us aid. An influential teacher was M. S. Huzurbazar who did not have a Ph.D. He was very direct but gave me helpful one-on-one attention.

Then you went to Notre Dame. I see that your Ph.D. advisor was Abraham Goetz.

Due to the education traditions prevalent in India at the time, I was only nineteen when I came to Notre Dame for graduate school. In order to make a choice of schools, my father and I perused the brochures and admissions materials for each of the graduate schools I was accepted to, but eventually we were persuaded by the fact that, at Notre Dame, all first-year graduate students were on fellowship, i.e., they had no teaching duties. I was concerned about teaching in a system (semesters, frequent testing, exams being written and graded by the same people who taught you in class) in which I had not yet been taught. I was also concerned that I would be overwhelmed trying to learn new mathematics and adjusting to the teaching system, all in my first year in the U.S.A. Notre Dame was a good choice, because the department provided a gradual increase in teaching responsibility in subsequent years.

I had to work very hard in my first year, and I felt mathematically unprepared for graduate school. I soon realized that some others were not doing as well as they had hoped either. Quitting the program was not a viable option given the enormity of the shame that would be associated with failing and returning to India. Although I was very worried when I took the (oral) candidacies, I passed. I started off in differential geometry, but that did not work out. At that point, I was engaged to be married and had decided that I would quit trying to get a doctorate and would teach high school instead. The Director of Graduate Studies, Alan Howard, talked to me and told me that the department would arrange for me to switch fields and advisors so that I could complete a Ph.D. degree. I ended up with a Ph.D. in universal algebra, under the direction of Abraham Goetz, who was a very supportive advisor.

My husband, Bill Higgins, who also received his Ph.D. in mathematics from the University of Notre Dame, was hired by Lake Erie College, which is about 30 miles east of Cleveland. It was a very small college and it became clear that the part-time employment I had would never progress to a career there. I taught as a substitute teacher at a high school, and I quickly decided that I'd rather not do that for a career. Bill got a job at Wittenberg University. I applied for jobs in the general area of Wittenberg University. The business school at the University of Dayton had turned over some courses to the Department of Mathematics to teach, and I was lucky enough to contact the mathematics department just as it became clear that they would have a full-time position for the following year.

How did you get involved in the MAA?

Members of Bill's department had a tradition of going to the meetings of the Ohio Section – often traveling together in a Wittenberg University van. Bill and I joined them. I began taking students to these meetings, and I also gave talks. Will Hahn and Milt Cox were key members of a new MAA committee to investigate the idea of Student Chapters. Milt Cox was very active in the Ohio Section at that time, and I suspect he recommended that I be appointed to the committee. Others involved were Al Wilcox (who was Executive Director of the MAA then), Chuck Cable, Bob Eslinger and Howard Anton.

You were a great group and MAA's Committee on Student Chapters is still a strong group. Weren't you chair for a time?

Yes. Howard Anton was chair when the committee was first formed, and we were able to do so much – create programming for undergraduates at the national meeting, create MAA Student Paper sessions at Mathfest (Pi Mu Epsilon had sessions already), create a newsletter for Student Chapters. After Howard Anton finished his terms as chair, I was appointed chair. Because of that I was put on the Meetings Council. I also served on the Professional Development Committee. I was also made chair of the Membership Committee, but I had no affinity for that assignment. Jerry Porter (former Treasurer of the MAA) once

asked, in casual conversation, how being Chair of the Membership Committee was going, and I said that I didn't really know what I should be doing on there, and that this kind of assignment is really not something I am suited for. To which he said, "Ask to be put on something else." I was shocked and said I couldn't do that – I felt honor bound to do what I had been assigned. He got a very serious look on his face, and said something along these lines, "Look, this is how the MAA works. When the MAA knows of someone who is willing to work, they will assign her to various jobs. The MAA doesn't know what she really wants to do. The MAA just knows that they would like her to do some work for it. So tell the MAA what you really want to do. The MAA won't care about switching assignments. It just doesn't want to lose volunteers."

I was also appointed to some committees to recommend people for MAA Invited Lectures at the Joint Meetings and at Mathfests, including a very memorable committee chaired by Paul Halmos.

This must have been in the early 1990s. How did you get involved with Project NExT?

After I gave a talk at Saint Louis University, Chris Stevens "interviewed" me and then invited me to organize a short course on undergraduate research for the Project NExT Fellows who were meeting at the AMS-MAA 1995 summer meetings in Burlington, Vermont. The next few summers I was invited to repeat the course, and I was invited to be a consultant for a couple of groups of Project NExT Fellows. When I heard that Jim Leitzel was ill, I offered to help Chris if she thought she could use me. It turned out that she was happy to have my help, and soon after that, Chris formally brought on Joe Gallian and me as co-directors of Project NExT. Chris is a wonderful manager of people, and we functioned very well as a team, along with Judith Covington and Gavin LaRose, who were Project NExT Fellows from the very first group. Chris sought our opinions about most things associated with Project NExT. We worked together on most of the essential parts of Project NExT, including reading the applications, selecting the Fellows and finding appropriate presenters to fill a two-and-a-half day workshop.

Project NExT is now an established program of the MAA. In 2011, we will welcome the eighteenth group of Project NExT Fellows. Since Project NExT is a professional development program, it has been delightful to know so many Fellows (over 1300) and follow their careers. It is fun for me to look through a program of an upcoming mathematics conference or meeting, and recognize many Fellows' names as organizers of sessions, speakers, officers, award winners. It is a further delight to hear from Project NExT Fellows, who tell us that they feel that Project NExT was instrumental in the choices they made and in their successes. It is very gratifying.

Working on the leadership team of Project NExT is always interesting. You can probably relate to this as a former MAA Associate Secretary for Meetings – each

meeting is similar to the one before, but very different. This means that you are confronted with a new set of challenges in which you must insert the structure with which you are familiar. So, for example, when Mathfest was held on a college campus, one of the challenges was leaving enough time between sessions in the program to get to the next session on time, since we didn't have a feel for distances on that campus. Another challenge was figuring out when the college campus dining services would operate their meals, so that our sessions could be timed to allow the Fellows and presenters to eat and network over meals. Then, our meetings moved to hotels, and none of the concerns I have mentioned apply, but new ones do. For example, the Project NExT leadership team has to specify menus for six consecutive meals in the same hotel and keep these costs reasonable!

What accomplishments in the MAA are you especially proud of?

My work with Student Chapters and, of course, my long-time involvement with Project NExT.

Are there any efforts of yours in the MAA that you are disappointed with?

As I said before, I didn't do well as chair of the Membership Committee, for which I was not suited.

What changes have you seen in the MAA since you first became involved?

There are many more activities that target undergraduates at the national meetings. A question like this makes me feel old. My focus is on the summers, since that is the time of most impact for me given my work with my own undergraduates, the Student Chapters Committee and now Project NExT. I remember taking students to speak at the summer meeting when it was a *joint* meeting with the AMS, I remember a year when there was no MAA summer meeting (after the AMS pulled out of the summer meetings), and MAA's challenge to organize Mathfests with rather small attendance – about 600, I think – to the large 1500-registered meetings that they are today. We rarely have dorm accommodations now and Mathfest has lost some intimacy, while gaining more sessions and more mathematicians participating in it.

Have you been heavily involved in your section?

Yes. In fact, I was President of the Ohio Section of the MAA. Before that, I served on some committees, like one on student members. After my term as President of the Ohio Section, I was automatically serving on, and chairing, committees like the Nominating Committee and the Teaching Award committee.

Have you been active in any other mathematics organizations?

Although I am a long-time member of the AMS and the AWM and have served on a committee or with the AWM Essay Contest, and I am an occasional member of the NCTM, my service to mathematics professional organizations has been essentially service to the MAA.

What personalities have stood out in the mathematical community, in the MAA and elsewhere?

The list of people I am indebted to is long and would include everyone I've already mentioned. At the national level, it would include Chris Stevens, Joe Gallian and Ron Graham. And, of course, my husband Bill Higgins, who can completely ignore my blustering, and yet offer me a thoughtful solution to a problem (be it domestic or mathematical or student-related) often delivered with a pun or a one-liner.

Thanks, Aparna, for an interesting interview. It makes me wish I knew Bill better.