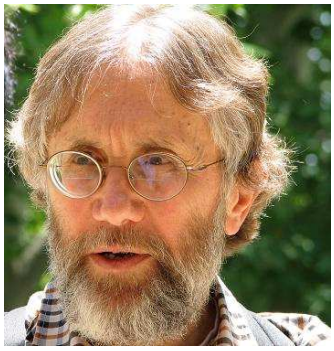

Know Your Wisconsin Mathematician

Interview with Professor Richard Brualdi, UW-Madison by J. Sriskandarajah, Madison Area Technical College.

Professor Brualdi retired after a very successful career at the UW - Madison (1965-2008). He has served on many editorial boards and has published four books and more than 200 papers. To learn more about Professor Brualdi, please visit his website: http://www.math.wisc.edu/~brualdi/

If you have any comments or suggestions to improve this section, please email Sri (jsriskandara@matcmadison.edu) . Thanks.

Let's start w/your boyhood. What impression did grade school make on you?

I grew up in a working class family living in a working class town in Connecticut.

In general I excelled at school (except in penmanship!). I was encouraged by my parents even though my mother stopped school at the 7th grade. My father worked in a factory but at some point went to night business school and earned an associate degree. He later started a business that my younger brother now runs. I believe I got my strong work ethic from my family. Even my grandmother, who emigrated from Italy and who never could read English very well, started a catering business for Italian weddings and such. My education through high school was nothing special; I did well in mathematics but there were no special programs or activities that I was aware of.

You went to the University of Connecticut as an undergraduate and Syracuse University as a graduate. What was the environment like?

UConn was the only school that I applied to; I was not very worldly at the time. The environment at UConn varied considerably with a very high dropout rate the first year. I was more or less an average student my first three semesters. After that I studied all the time and graduated "with high honors." I almost majored in bacteriology. At UConn I took just about every math course they offered. In my last semester, although I could have coasted, I took four math courses, including projective geometry which doesn't seem to be taught much anymore.

Syracuse was a wonderful place to be a graduate student in the 1960s. It had a good faculty and a large and good graduate student population. I was fortunate in that after two years there, Herb Ryser, then one of the top two or three combinatorialists at the time, came to Syracuse. My work with him has greatly influenced my mathematical career. Herb, who was from Milwaukee and got a PhD from Wisconsin, stayed at Syracuse only five years and then went to Caltech. He and I were starting to write a book together when he suddenly died. I went on to write the book and I included Herb as a coauthor. During the 1960s there were three Syracuse PhDs in the mathematics faculty in Madison.

Tell us something about your career in Madison.

After getting the PhD in 1964 from Syracuse, I spent one year at the National Bureau of Standards (then in Washington, DC, now called National Institute of Standards and Technology and located in Gaithersburg, MD). I had no duties whatsoever, and just did mathematics, some with Morris Newman. While there I applied to three (just three, more or less standard at the time) universities. I got offers from all three and chose Wisconsin because of people I had heard of who were there, like Hans Schneider, Richard Bruck, Henry Mann, all doing work on matrices and combinatorics. It was a great choice.

Wisconsin was and is a stimulating place with great colleagues and great traditions. I loved to teach, and I developed several new courses, one of which led to my book "Introductory

Combinatorics", first published in 1977 and now in its fifth edition in 2009. My graduate students played the most important role in my mathematical life at Wisconsin. I have had 32 students who received PhDs, with 5 more now in the pipeline. I talked and worked with graduate students all the time. My best years at Wisconsin were the six years (1993-1999) I spent as chair. I used to say, that from 1965 to 1993 I lived in the Mathematics Department. Starting in 1993 I lived in the University. I got to know and work with so many wonderful people then and afterwards, and to learn so much about the university. Someone once asked me why I liked being chair; my answer was that I liked being important and I liked being closely involved with the affairs of the Department, the College, and the University. Whether or not I was important, I certainly felt like I was. I enjoyed presiding over departmental functions.

I became an emeritus faculty member in 2008 after 42 ½ years on the faculty. But I am hardly retired. As I already said, I have five PhD students, I continue to do research and write (my fifth book was published just a few months ago), I continue to go to conferences, I am one of three editors-in-chief of the journal "Linear Algebra and its Applications", and one of eight editors-in-chief of the Electronic Journal of Combinatorics. Being an emeritus faculty member gives one a lot of flexibility in one's schedule. That I like.

You have travelled extensively. What are some of your favorite places?

The most spectacular place I have ever been to was Antarctica. It wasn't because of a conference there! The icebergs, penguins, and scenery in general are incredibly magnificent. I recommend it to everyone. But you can't go on the ship we had because that one is at the bottom of the Southern Ocean, it having sunk a couple of years ago on one of its excursions. Fortunately, there were other ships nearby that rescued everyone. I have been so privileged to go to conferences all over the world: Japan, Korea, Thailand, India, Israel, Greece, Chile, Brazil, Mexico, Greece, Italy, Hungary, France, Portugal, Spain, Canada, England, Germany, New Zealand, Czech Republic, and Iran. In fact, I am going to a conference in Tehran, Iran this coming May. In spite of the political differences on the governmental level, the Iranian people are some of the most friendly and hospitable people I know. My two previous trips to Iran have been very memorable. In 2010, I'll go back to Portugal and Italy, and then to Serbia for the first time.

What is the best part/worst part of being a mathematician?

The best part is the discovery and proving process. The way I do research is to start thinking about something, formulate some questions, and see where they lead you. I let the problem lead me (possibly to quite different problems) rather than lead the problem. Once you are fixed on a question, a result you believe is true and within reach, it is difficult to let go. Another best part is meeting and collaborating with mathematicians from all over the world and the travel involved (see above).

The worst part? Well, I am not sure that there is a worst part. Of course, there is sometimes the frustration of not being able to come up with a proof even though you "know" it's true. We are a very privileged lot, doing what we love to do, teaching courses on topics we are interested in, and having job security through tenure. I always say that I haven't lived in the real world since I was a teenager.

You have served in so many math committees. Can you elaborate on your services to the mathematical community?

I was President of the International Linear Algebra Society (ILAS) , a great community of people. This was a rewarding and enjoyable job in planning conferences, overseeing an electronic journal, interacting with people, … . I have also served on the Editorial Boards Committee of the American Mathematical Society. I was involved with the two MAA Summer Fests held in Madison, most recently as chair of the committee to select invited speakers. I have served on many committees of the University; in particular, I chaired the implementation committees for the Quantitative Reasoning requirement and for the Freshman First Year Experience Program.

What other careers do you think you might have been good at?

I think I would have made a good secretary, since I am reasonably well-organized.

I want to talk about how you do mathematics and how you did it. Has it changed over the years? Did you do it differently at 30 than you did at 40, 50, 60?

Of course, technology enables us to get lots of data to make and test conjectures. This was not so easily done when I started out. The invention of MatLab by Cleve Moler has had a profound effect on e.g. matrix theorists. But basically, I think and scratch with a pencil and paper. My favorite mathematical work on do these days is writing. I love to organize ideas and results and to present them in an organized and clear way. This passion contributed to my writing five books and numerous papers.

It is hard for most mathematician to explain what their subject is to non-specialists for some very obvious reasons, not the least of which is language., if you are outside the field. How would you describe, let say to a freshman or sophomore HS student, how a professional mathematician really does his/her subject?

Indeed, it is difficult. I could say that I study various patterns, some of which are motivated by real-world applications, others of which come out of my head, and may sometime in the future have an application. But it is not applications that motivate my work. Mathematics is a powerful language for expressing and studying ideas and figuring how they relate to other ideas.

What do you think makes a mathematician successful?

A lot of hard work, being curious, and motivation, along with the intellectual capacity to pursue that work.

What of your mathematical work do you like best?

I have worked on many topics in matrix theory, combinatorics, graph theory, coding theory, and matroid theory. I loved it all, and continue to do so. I never have worked on one particular topic for years and years but have gone wherever my curiosity leads me.

What have been some moments that have stood out for you in your career so far?

It's been quite a ride and it's not over yet. I was lucky enough to receive the Hans Schneider Prize for lifetime accomplishment from ILAS, and an Euler Medal from the Institute of Combinatorics and Applications, again for lifetime achievement. I received many years ago the Chancellor's Award for Excellence in Teaching, and an Outstanding Alumini Award from the Mathematics Department of UConn. A few years ago ILAS had a conference in my honor in Coimbra, Portugal. The best is the small conference my former graduate students organized in my honor in Madison. As I have said above, they have been the central part of my career here in Madison. I have had more than my share of honors, and I am humbled by them. The honor from the university that I most cherish is that of being awarded a Bascom Professorship.

I have enjoyed immensely working on the two journals mentioned above. It brings me in contact with so many wonderful mathematicians and one gets to see the great volume of mathematics being done.

What besides mathematics do you like to do?

I have been a runner for a long time now, and like to compete in races (like the Crazylegs Race, the Komen Race for the Cure, the Run for Literacy). I run about 3 miles or 5K four times a week to keep me in reasonable shape. I also like biking trips and cross-country skiing. I like music (especially opera), and we go to concerts often, as well as movies. We also belong to an enjoyable book club. I like to read. Right now I am taking an even Italian class in preparation for a bicycling trip in Sicily this September.