

# Eulogy for Dan Archdeacon

3/10/2014



It is hard for me to express how deeply saddened we are at Dan's passing. It's a small comfort to have this opportunity to speak about my friend, colleague and soul-mate, Dan Archdeacon.

Dan was a great guy and characterizing him is difficult, but some things about him were clearly apparent. Dan had a keen sense of humor and a sharp wit. He was always ready with a quip or bad pun. He was extremely smart and indeed was a brilliant and world renowned mathematician. He was a kind and gentle soul, who never had a mean word to say about anyone. Dan was always courteous, considerate and respectful of others – he always made the people around him feel comfortable. It was always clear that his love for Mara was deep and meaningful and that he was an awesome father to Talis and Nick. He was just an easy guy to be around: he was fun loving, interesting, smart, insightful and friendly.

But let me back up some years and put some things in e perspective. Dan and I met 40 years ago when he began graduate school in mathematics at Ohio State in 1975. Those of you who know Dan from his UVM days probably think of him as a highly responsible faculty member, a list-maker who lived by his "to do" lists, a by-the-books guy who followed the rules. Well, in 1975 I met a different Dan. We called him Loosey-Goosey Dan. He had hair down past his shoulders, wore overalls, a straw hat and John Lennon style glasses -- He was a total hippy (in all the best ways). We bonded immediately. After I sent out the news of Dan's passing I heard back from some of our contemporaries in graduate school. Andy Woldar, who is a now a professor at Villanova, remembers meeting Dan. He says "*I first met Dan while sitting in on a calculus class that he was teaching: he had long blond hair clipped together in a pony-tail, and was wearing a tee-shirt that said "Teacher"*". I love that image of Dan.

We eventually became roommates and best friends and lived together for 3 years on the first floor of a sprawling old house on Arcadia Ave. in Columbus, Ohio. We had a lot of shared experiences at that house and we both loved telling stories of those days. That period of time was the most fun time in my entire life and I am certain that Dan shared that view.



Three grad school roommates, Tim Tillson, Dan Archdeon, Jeff Dinitz

Loosey-goosey Dan was up for anything. We played hours of Frisbee, taking pride in our trick throws and catches. We played a lot of Frisbee golf, too. Our course started and ended at the house on Arcadia. We played ping pong in the basement of Arcadia on Dan's ratty old ping pong table. We listened to music of all sorts—rock and roll, classical, jazz--including many of the songs playing before this service. In the summers, we played on a very good math grad student softball team (sometimes called the antiderivatives and sometimes the disintegrators). We went skiing on Fridays in the winter (believe it or not, at Mansfield, a hill in central Ohio), and backpacking in the summers. We were also into running. We had many long and beautiful runs along the Olentangy River, with a big buildup to the New York City marathon – which we ran twice, in 1978 and 1979. Although twenty six miles in the heat nearly did us both in, we had a blast, making the trip from Columbus to NYC, hanging out in Central Park, and eating pasta in the Village the night before the race.



You may be wondering—did these guys do any math? Well, it wasn't all fun and games at Arcadia. Luckily, Dan was so brilliant that he didn't have to work as hard as I did. It's hard to believe now, but loosey-goosey Dan didn't worry much about studying for his qualifying exams or orals, and passed them anyway (though by the seat of his pants). When we were both going great guns on our Ph.D. dissertations and getting lots of results, we would each put up our "theorem for the day" on our house blackboard, taking gleeful pride in deleting each other's previous theorems as we got a new one. If I remember right, Dan got the last laugh. And indeed in 1980, after all that fun, we did both get our Ph.D's



One unfortunate thing about being a math grad student at that time was that 95% of our 150 or so fellow graduate students were male. Luckily, upstairs from these three young math grad students lived a girl who was a graduate student in the English Department. Her name was Mara. And about 70% of her fellow graduate students in English were women. We joined forces, and threw a series of epic house parties. These parties were pretty crazy and fairly famous for their size, duration and bad taste, including a Jimmy Jones party (where we drank purple grain alcohol Johnstown punch and a 3 Mile Island party (we wore booties and radiation badges).

But that's not the most important part – amazingly, the three math roommates ended up marrying three of the English grad students. Dan married Mara, Tim married Kate and I married Sue. And all the marriages lasted and thrived. Dan and Mara and Sue and I planned our weddings to be a week apart, and then we went on our honeymoons together. This photo is from the tacky motel we stayed in at Niagara Falls on our way to canoeing at Algonquin Park.





We got real jobs – me here at UVM, Dan at the University of Kansas— and I still remember our two U-Haul trucks parked in front of Arcadia, his pointed west – mine east.

And this is when we began to see Dan morph from loosey-goosey Dan into responsible- adult Dan. I think the first change was on his drive to Kansas. He had been a vegetarian all during graduate school, probably weighing 130 pounds or so as he was a “lazy” vegetarian who basically ate macaroni and cheese with occasional trips to the salad bar at our local fast food joint. Soon after arriving in Kansas, he asked Mara to cut his hair—one of the photos in the sequence that opened the service. He surprised Mara one night by ordering steak when they were out to dinner, with no fanfare. And then Talis was born to a very delighted, proud and responsible father.

In 1982 we had an opening for a mathematician in combinatorics and were lucky to hire Dan. So Dan and Mara rejoined Sue and I here at UVM. And we started a new series of traditions, with wild dance parties replaced by kids’ birthday parties, backpacking replaced by annual family foliage hikes down Mad River Glen, Friday night skiing replaced by Sunday skiing with the kids at Mad River, and eventually kayaking and canoeing from Dan’s lovely beachfront on Lake Iroquois.

From the time Dan arrived at UVM in 1982 until 2009, when we hired Greg Warrington, Dan and I made up the combinatorics research group here at UVM. In the late 80’s and early 90’s we ran a series of 7 small conferences (workshops if you will) in Vermont, 4 of them in topological graph theory. These were very specialized, by invitation only, and we attracted the top researchers in the world. These workshops greatly helped to put UVM on the map for combinatorics research.



1991 Vermont Summer Workshop on Combinatorics, Stowe, Vermont

I'd like to take this opportunity to talk a little about Dan's mathematics as it was such an important part of his life. Dan was in an area called topological graph theory. His interests there were broad and deep, but basically he was always interested in drawing graphs on surfaces.

As Dan always said – he got paid to play “connect the dots”. He always considered doing math just playing with math, it was so much fun for him. His dissertation was titled “a Kuratowski Theorem for the Projective Plane” and it remains his most highly cited result. In 1930 Kuratowski proved that if you want to draw a graph on the plane without crossing any of the edges, then the graph cannot contain one of two special graphs – these are called the minimal obstruction graphs for the plane. Well, it had long been thought that there must be a list of obstruction graphs for other surfaces such as the torus or the Mobius band or a torus with 2 or for that matter 10 holes. Dan's thesis was the first proof of the exact set of obstruction graphs for the so-called projective plane. But instead of 2 minimal obstruction graphs there are exactly 103 of them. This showed the organizational skills that Dan possessed (that's a lot of cases), but also foreshadowed the high quality of his subsequent work. It is hard to describe much of it here, but of one of his later paper on obstruction sets, the reviewer said it was “masterful” and ends his review by saying, “This paper ... constitutes a tremendous advance over previous results.” He had many other excellent results over his career, and in total will have about 80 refereed publications. He was extremely active the past few years, with 5 papers published in 2014 and another 5 papers submitted. He left several in progress. In fact two of his papers on the new and exciting topic of Heffter arrays and biembeddings on surfaces were just accepted the week after his passing.

Jozef Siran, a professor at the Open University in England specializing in topological graph theory and a close colleague of Dan, wrote me that

*It is still hard to realise that we lost him. I have 12 joint papers with him and working with Dan was always a combination of pleasure and huge intellectual challenge because of his highly non-standard ideas.*

*It won't be easy to talk about Dan's math. I would say in the first place that he could be described as a `visionary'. He was very thoughtful about what one should do, which direction to go, and what would be of importance to prove. He has several valuable survey papers with lots of open problem that have been the driving force of research, and also maintained a web page of open problems.*

As a measure of Dan's stature in the field, we can point to the fact that he was on the editorial boards of the top two journals in graph theory. These editorial boards are small and very selective and in general Dan was in charge of all of topological graph theory. He was the managing editor of the Journal of Graph theory for five years. He very much helped to shape the field with this work and maybe even more so by his prolific refereeing for journals. I counted that he refereed articles for at least 35 different journals. I know he did dozens per year – a huge commitment and tremendous service to this profession. . Dan was an invited lecturer at conferences and universities around the world, including. Japan, Korea, New Zealand Denmark, Slovenia, Slovakia Canada, England, Mexico, Germany, Wales, Scotland, Peru, Czech Republic, France, Spain, the Netherlands, Latvia, and Hawaii (in the winte--I said he was smart) . He took full advantage of his sabbatical opportunities, going to top universities and at times even brought either Talis or Nick with him.



Dan at a conference in Japan

For his “outstanding and sustained research and scholarly contributions to both the University of Vermont and the greater academic community” Dan was named a University Scholar in 2004.

Dan was also a great role model and mentor. I would like to read this note that was sent by Paul Bonnington, who is now at Monash University in Australia and holds the position of professor of mathematics and Director of e-research at Monash. The photo is from a conference in Korea in 2002.

*“Dan was my very dear friend and long-time collaborator. I will miss him dearly. We collaborated on 13 publications over a span of 22 years including a publication as recent as last year.  
No one has had more influence on my academic career than Dan. I owe him so much. He was my mentor at the beginning of my career and taught me to appreciate the pure joy of problem solving that has sustained me since.  
I was honored that he would choose to spend two long sabbaticals with me in New Zealand, and I felt privileged he allowed me to call Vermont my second home.  
I never got to tell Dan how much influence he had on shaping who I am before he passed - this I regret. I only hope he knew.  
I feel very privileged that someone I connected with professionally in my work was also one of my closest friends for so many years - a true soulmate.  
My sincere condolences to Mara, Nick and Talis, and to his colleagues/friends at UVM.”*



Dan and Paul Bonnington in Japan



Dan and I share a small lounge outside of our offices -- dubbed the “combo lounge”. We’ve spent countless hours there doing math together. Whether we were just trying to stay a day or so ahead of the students or working out a new theorem, doing math with Dan will always be one of the highlights of my life. Sitting in our combo lounge putting ideas on the blackboard was what we lived for mathematically. Sometimes I’d get an idea, sometimes Dan, sometimes it would be simultaneous. Sometimes we’d get no idea at all. But I could tell when something clicked with Dan – he would sit quiet for a minute, then explain his nascent idea, then we would act on it. Dan was truly brilliant. Dan and I wrote about 12 joint papers, including our first publication (together with our grad school roommates at OSU, Tim Tillson and Doug Stinson) and one in the 80’s called V-squares – the V for Vermont. He really loved it here. We just submitted a joint paper in December and I know Dan would be pleased to hear that it was accepted just last week.



Dan and Jeff in the 1980’s, working on V-squares

As great a researcher as Dan was, he was an equally great departmental and university citizen. As noted before he was a long serving member of the Professional Standards committee, but he did so much more for UVM. He basically never turned down an opportunity to serve. He was the Interim Chair for the Department of Computer Science in 1999 – 2000, was the head and longtime member of the mathematics department graduate committee, and on countless departmental, college and faculty senate committees, including executive committees of the faculty senate and the graduate college. He didn’t do these to pad his vita or to get a big raise – he did it out of a sense of duty. A very strong Dan trait. He never learned to say no. In his later days here, when he did had to say no a few times because of ill health, he always felt guilty for doing so.

That Dan would dutifully try to do anything asked of him was also evident even on the softball field. We had a pretty decent math department softball team here up until a few years ago (when we collectively got too old) . Here is a photo of the Eulers – from 2003. Dan was very versatile and would play any position asked of him, all with equal verve and moderate ability.



The 2003 Eulers

Indeed, Dan was fearless, willing to try anything. He would teach anything he was asked to — whether it was in his area or not—confident that he could keep ahead of the students. By my count, he taught 29 different math classes, surely more than any other person ever. He was very proud of this fact. He sometimes only prepare minimally for his classes—a remaining trait of loosey-goosey Dan? I think he enjoyed the challenge and the resulting spontaneity in doing it for the first time in front of the class. Mostly he'd come back with a glowing story about how great his lecture went. Sometimes – not so much. I always was kind of amazed at this, but it was his style and he did well with it.

He was loved by many of his students. When I posted on Facebook the sad news of his death, many of them responded with short notes about Dan. For example Aaron Sullivan, who as an undergraduate student here took an independent study class with Dan on math and music said: *How terrible. Archdeacon was an awesome teacher and an awesome person. Every class was a downright pleasure. There are many, many fond memories of this guy in the graduates of UVM, I can tell you that*". Jason Mimick, a former graduate student said: *"I'm really sad to hear this news. He was an incredible mentor, role model and friend - my thoughts and prayers to his family and UVM"*. Matt Welz another former graduate student kind of hit it when he said *"So sad. He was such a smart, kind, and silly man. He was always really nice to us. We'll miss him very much."*

There are other aspects of Dan which may be surprising to you that I would like to briefly touch on. Dan participated in a lot of different sports – none particularly well, but he enjoyed them greatly. In addition to skiing and kayaking, he played pool and he even was a fencer for a while, so he could share that experience with Talis. Dan also loved to watch sports, especially the Ohio State Buckeyes and the Cincinnati Reds. He avidly played fantasy baseball for years – I think he even won his league a few times. Dan was an extremely avid reader. I'm not sure he had particularly good taste in books – I think he just read everything. I remember all the book cases filled with Dan's cheap paperbacks in the lower level of his house on East Terrace and then in one of their basement rooms in Williston.



Dan and I did many things together through the years, but one thing we did religiously was watch the Ohio State Buckeyes football games together. The Buckeye games are almost always on tv and we watched nearly every one together, either at his place or mine. The last activity we did together was watch the Buckeyes win the National Championship this year. It was mid January (only about 4 weeks before he died) and Dan was very ill. But we both put on our Buckeye Jerseys and cheered them home. Going full circle from being students and roommates to celebrating that national championship together – it was an awesome moment for us.

For years the math department designed and sold math tee shirts. We had many fun and interesting shirts, but our classic one was the peace, love, math, shirt. Next to peace was a peace sign, next to love was a heart and next to math was an infinity symbol. Classic. As fate would have it, this was the last shirt worn by Dan, chosen by Nick and Talis. There is no more fitting shirt for Dan. He was indeed a peaceful man. He went to Earlham College, a Quaker school, and lived his life as a pacifist. He even hated arguments. Dan was so full of love for Mara, Talis and Nick and they for him. And it was math that so defined Dan. He was always thinking about a problem and had a clipboard handy to jot down ideas. He had so much fun doing math. From loosey-goosey Dan to responsible-adult Dan, math was a constant. I have received letters from mathematicians worldwide expressing their respect for him and the math that he created. But also noting what a great guy he was. Kind, funny, smart, sometimes silly, always considerate -- We'll miss him so much.

