Building a big tent: Ted Vessey and the mathematics department at St. Olaf College

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Ted Vessey, long-time chair of the mathematics department at St. Olaf College, one of the reasons the department rose to such phenomenal success in the late 1970s and 1980s, and a consummate story-teller, sat down with us a couple of years ago to tell us his story. He told us about his path to St. Olaf, building the department, and how to make a successful program in mathematics.

Q: An important story in the history of American mathematics is the St. Olaf program. We want to talk to you about what happened there: what happened and how it happened. First, let's get some background on you. Tell us about growing up and studying math.

TV: I grew up just north of St. Paul, Minnesota. We lived out in rural Ramsey County. Now it's actually a suburb, but not when I grew up. I grew up on Lake Johanna there and went to public schools.

My grandfather lived with us while I was growing up and I had a brother who was two years older who was not particularly good at math. Every afternoon we would sit at the kitchen or dining room table and my grandfather would drill my brother. And of course I was there too. I knew my math tables, whatever he was drilling, I knew before it was my time to know them, so I had a head start.

I liked school a lot; I was an enthusiastic student as I remember. We were very good arithmetically back then because we didn't have calculators. Still are. My grandfather had all sorts of tricks for multiplying things. How to multiply by 9s, 11s, you know, and I was always very good at it. One of the first jobs I ever had was working in a drug store; I put stuff on the shelf and worked at the cash register. The cash register didn't add, it was just a cash register. One thing you learned very quickly was the complement of any two digit number to a hundred – say "63" and "37" comes to mind immediately. I thought everyone was good at that, but now nobody knows how to do that. It's a fine art or something.

Q: Did you have mathematicians in the family?

TV: No, neither of my parents went to college. My dad was a purchasing agent, first for Montgomery Ward and then for the state of Minnesota. He was a very bright guy. He worked very hard. Very serious. Mom was a homemaker until my brother was going to go to college, and we didn't have very much money, so she got a job at the St. Paul newspaper ostensibly running a high-powered comptometer. It was something like a high-powered calculator or adding machine. She ended up doing consumer research for them in their advertising department. She was going to do that just while my brother was in college, but she did it until she retired because she liked it.

I had the very good fortune to go to three high schools and never move. My first year was at St. Paul Central which was a forty-minute bus ride each way, then we went to some place called Alexander Ramsey for my sophomore year, and then I went to Mounds View High School for my last two years. That was a terrific experience because when we moved in there as juniors there were no seniors because the kids who were seniors got to stay in whatever high school they were at. We were the oldest class for

two years, which was really fun. I was a pretty good student.

Somebody asked me how I ended up teaching math and the response was obvious: getting Kermit Anderson, who was my high school teacher in both my junior and senior years. In those days we didn't have things like pre-calculus; junior year was higher algebra and senior year was called "Trigonometry and Solid Geometry." He also taught my chemistry course and my physics course. He was also the end coach on the football team; I was a tight end. So I spent a lot of time with Kermit Anderson. He was a man I admired for his enthusiasm, his incredible enthusiasm. It was fun to be in the presence of someone who loved math and science. When I graduated from there I knew I was going to do something in math and science. If you think about it, this was the late fifties, and sort of the beginning of the space age. The Space Race, you know? I graduated in 1956, the year before Sputnik. I went off to do science something.

I was always going to college. It never occurred to me to question if I would go to college. My wife's family was the same way; her mother and father went to high school but it was never a question that the kids would go to college. So, going to college was a given, and I assumed like everybody else that I would go to the University of Minnesota. I couldn't afford private schools, and one day I was called out of class by a recruiter from Wesleyan University in Connecticut. I don't know how he'd heard about me, but by the end of our interview, he'd offered me a scholarship. I assumed they needed either red-haired people or people from the Midwest. I thought "this is an opportunity I can't turn down," so I went to Wesleyan for one year.

I never felt comfortable there. Almost everybody there was a prep-schooler and they were really very different than a guy who went to a county high school in Minnesota. About everything. I wasn't terribly successful academically.

My math experience there was really one of the profound influences on my entire professional life. It was supposed to be calculus, but they had a visiting instructor there from Reed College in Oregon. He taught this calculus course with only notes. There was no book. We were to develop the real number system during the first semester, so we started out with Peano's Axioms and until we actually developed the integers, the guy was such a purist that he didn't number the pages of his notes.

It was a disaster. It was a total disaster. I felt like I had no idea all first semester. I did homework, but I didn't know why we were doing what we were doing. Then we moved on to rationals and we did all the classical things, the equivalence classes. You have to remember that this was a time when they were introducing modern math to first-graders. And first-graders could learn about commutative and associative laws and learn to develop the real number system. I remember I came home for Christmas break and our task, while we were home, was to find out how to extend the rationals to the reals.

I heard he was famous at Reed for just destroying people. I don't know how he got to teach this course at Wesleyan, but this course was significant in my view of what mathematics is about and what mathematics should not be about. And I have to tell you in my storied career I've met people who have exactly the same view of mathematics as he did. So I transferred back to the University of Minnesota.

Minnesota had two Nobel Laureates in physics so I justified going back because, after all, who wouldn't want to study with Nobel Laureates? And I became a physics major. I started calculus all over again; it was my sophomore year when I took calculus.

Q: Did that put you behind?

TV: I think most students starting at the U had analytic geometry and trigonometry for their first year,

maybe some calculus, but I started in calculus. The only problem was I was sort of behind everybody else in my class in physics. Most had calculus; I was learning it again for the first time, but I did very well. I had a book that I understood and at the end of every section were 100 or 150 exercises. I did them all. I handed in what they told me, but right before a test, I did them all.

I really liked it and I liked my physics, and I crushed physics, just crushed physics. I found my home. Because of my experience at Wesleyan, I didn't go to the Institute of Technology at the U, I stayed in the college of liberal arts where they had a physics major which allowed me to study other things like languages and political science and humanities kinds of courses, which I thoroughly enjoyed. I was cruising along doing well in physics, and taking the requisite math courses. Physics majors always had math courses. Between my junior and senior years, I actually looked at the college catalog carefully and discovered that I only needed two more mathematics courses beyond what I was planning to take, and I could have a math major. Well my mother didn't raise dumb children. Two courses! So I went over to the career planning and placement people and I talked to the guy there who was in charge. And I said "Am I better off to have a double major in math and physics than just a major in physics?" And he snorted and said "But of course! Those are the two hardest majors at the University! If you can do well in both of them, you have opportunities to go in any direction you want." So I did. I decided to take those two extra courses, and they were, not surprisingly, abstract algebra and real analysis. I just loved those courses.

I took a course in electricity and magnetism from one of those two Nobel Laureates, and it was arguably the worst taught course I felt I had ever been in. But he was a Nobel Laureate. Then I took this capstone course the last two quarters, taught by a visiting professor. This guy came from Argonne National Laboratory, and he'd never taught before. So, simultaneously, I was taking these math courses I just absolutely loved and this physics course I absolutely hated, and somewhere in there I became a math major with physics as a secondary major. I won a prize as an outstanding physics major at the University that year the same day I applied to graduate schools in mathematics. The very same day. Applying to graduate school was kind of interesting. I was walking down the hall and the chairman of the math department came up to me and said "Vessey, how close are you to graduating?" and I said "I only need a few more credits" and he said "Well, you could be in graduate school!" I said "Yes I could, but why would I do that?" and he said, "Because if you're in grad school I'll give you a TA."

It never occurred to me before this conversation to go to grad school for mathematics. I didn't know what I was going to do. This was the middle of my senior year. I went over to the grad school, and the lady looked at my transcript and said, "Yes, you can get into graduate school." I came back with a piece of paper and said, "I'm in graduate school now," and he reached across and he handed me a book called *College Algebra* and he said "You start tomorrow; it's from 3 – 4 everyday, five days a week." He gave me no instructions. Nobody came to see me teach, I just made it up as I went. And one thing I did was I didn't know which problems to assign so I worked all the problems, particularly in probability. I'd never had a course in probability, and there's a section where you do counting, so I worked those things backwards. I found out the answer was 27/93, and I asked myself "how could he get 27/93?" and I figured it out. And that's how I learned probability, which is not a bad way to learn it.

Q: Were you any good at teaching? Tell us about graduate school.

TV: You know, I think I was. My students really liked me. I had an amazing class. It was late in the afternoon with about 28 kids, all boys. Most of them were one year or two years younger than I was, but they seemed to like me. We laughed a lot. I had friends come and sit in the front row and read the newspaper. I thought it was just a gas to teach. I never really applied to any place else to go to grad school.

David Storvick was my adviser in complex analysis. And people have asked me why I studied complex analysis. It's because David Storvick did complex analysis. He was just magical in the classroom, and I just wanted to be him. It was not a coincidence why I would study the same thing. I just thought the world of him. Grad school was fun in those days. We knew there were jobs. There were jobs everywhere. Colleges and universities in America were expanding at top speed. The University of California was opening one or two campuses every year. And I didn't hurry through graduate school because I learned to ski. Several other graduate students were good skiers, and we skied in Colorado every year. It was very pleasant and non-pressure-filled, I was single, and life was good. I thoroughly enjoyed it. It took me six years. I probably could have done it in four, but there was no reason to do it. We were having such a good time, and I would have had to miss some of those ski trips.

There was this guy in real analysis who taught that course when I was a senior – he was so good and he was so fun to watch because he knew everything. He proved theorems three different ways: the quick way, the sloppy way, and the clear way. He showed us these proofs and it was just a real learning experience and fun.

I took a measure theory course. I took measure theory twice. I took it from a guy who shall remain nameless who went on to be a hotshot at the University of Illinois and it was hopeless. He was just hopeless. You learned everything in there by yourself. He would lecture and never turn around. He'd come in, he'd pick up a piece of chalk, he would never turn around, and the bell would ring and he'd pause to listen, and if we weren't leaving he'd write some more. We had a guy come down and rattle the door everyday because he wanted to teach his class, and this guy would grab his coat and run out. I got an 'A' in the course and I took it again the next year so I could find out what was in measure theory. I had just mimicked what he had done. The second time it was like a different subject, it was really interesting and fun.

In Minnesota you had to have a minor in something, so I took statistics. I didn't take physics because I had taken all the easy physics classes! I fell in love with probability. Had I had a probability course, a good probability course, early on I would have probably been a probabilist. Most of the stuff I've done in the past twenty years has been probability-related. I just love probability. I took linear algebra, and it was arguably the hardest course I'd ever seen. It was just all theory; you could not see a single application. And I was really disappointed because I was looking forward to people talking about the beauty of linear algebra. It was just the way it was taught: definition, theorem, proof. It was just really ugly. Later it become my favorite course in the entire curriculum to teach once I found out what was really in there.

About a year and a half before I got my PhD, I ended up getting a wife, Margie, and she was the best decision I ever made. She was a student at the university.

Q: How'd you end up at St. Olaf?

TV: Well, first I had a job at the University of Wisconsin – Milwaukee. I was at Milwaukee from 1966 to 1970. Both of our sons were born in Milwaukee. Margie was an occupational therapist and worked at the hospital right across the street from the University of Milwaukee.

The curriculum at Milwaukee was built presuming that all of our undergraduate majors were going to go to graduate school in mathematics. It was the rule, the yardstick by which we measured a course. Do you need this for graduate school? And at what level do you need this to go to graduate school? And the reality is we probably had fifteen to eighteen majors every year, and Paul Humke is the only one I ever knew that went there and went to graduate school. He was a student there when I was there. But the rule was we had to use the highest power book we came across because that's what you need to know when

you get to graduate school. Silly, it was just silly. They insisted we use Rudin in our junior-level course. I went in and used Buck to make up my lectures for a class that was really using Rudin.

It was about an hour walk from where I worked to where I lived, and on the walk home, I always thought about what I could be doing for my class. I seldom was trying to figure out how to get delta for that epsilon; what I did in the classroom was important. So, I talked to Storvick and I told him I just felt like I had to make a move. And he said, "Well, Macalester has a job." To me, Macalester was the best place in the world. I grew up in St. Paul, I had friends who taught at Macalester. It's a great school; I knew where I'd live. So, I went to the national meetings to see about getting a job at Macalester. I talked to Storvick, and he said, "You know I heard St. Olaf might be hiring." and I said "St. Olaf?"

Q: Had you heard of St. Olaf?

TV: Sure, I grew up here but it wasn't talked about in the sense of Macalester. Macalester and Carleton were on one level and then there was everybody else. So I said to Storvick, who was a graduate of Luther College, "St. Olaf? I'm afraid these small colleges are going to go bankrupt." Lee College had gone out the year before. And he said, "Not St. Olaf, that's a flagship of Lutheran colleges, and it will be the last one to close its doors." So, I wrote Dick Kleber a letter, and he said, "Meet me at the meeting" and so Dick and I went for a long walk. I didn't know Kleber; Storvick had called him. That's how I got my job – Storvick had made calls. Storvick had called a guy at Milwaukee and the guy at Milwaukee invited me down. Storvick called the people at Syracuse so Syracuse invited me out. I got invited to have an interview at Macalester. This gets kind of interesting. So I'm up at Macalester and my dad calls the office while I'm giving my talk, which went okay I guess, but I gave a peer research talk; little did I know that I should give something other than a research talk. I was at a university and that's what you did: you gave research talks. I asked Joe Konhauser if I could use his phone because I had got this message "your Dad called." I called my dad, who lived ten miles from there, who said, "St. Olaf is trying to reach you." So I asked Joel if I could use his phone and I called Kleber, from Joel's phone. And I said to Kleber, not knowing anything about how interviews are run, "I'm in the Cities on business. Why don't I come down tomorrow?" And Kleber went, "Uh uh uh, okay." So I went to St. Olaf without anything set up. I met with the Dean who was a friend of Storvick's, and all I did at St. Olaf was just talk to people there, and I went to a regularly-scheduled department meeting. Now I couldn't wait to tell my wife about it: in that department meeting they sat around and talked about their students, and they knew them by name. That never would happen at a university – the top graduate students, maybe. And then, it was a young department sort of; there were two old people who were going to retire very quickly, then Kleber, the Chair at the time, is five years older than I am, so he was reasonably young at the time, and then they had Lynn Steen, Arthur Seebach, and Loren Larson, who were all my age. Larson and Seebach and I were born within six months of each other. Lynn was a couple years younger. It was so interesting.

I went back to Milwaukee and told my wife, "If either one of those places offers me a job, we're moving." And she said "St. Olaf, too?" And I remember, I said, "There is really something special about St. Olaf," based on just one day's visit. It was these young guys and the fact that they really cared about their students. It was just beautiful. And another thing that happened: one of the faculty walked me over to the Dean's office, and at least five students said hello to him on the way; this never happened at the University of Minnesota or at the University of Wisconsin, and when we got to the Dean's office, we were overlooking the student center where kids were skating. It's just the antithesis of the urban university; I was pretty enamored by the place. Kleber called in about three days and offered me a position and I remember saying "Gee, I can't answer you right now," because I was waiting to hear from Macalester. A couple days passed, and I said, "I can't lose that job" so I called Kleber and said, "I'm in." And Joe Konhauser called the next day to offer me the job at Macalester; it turns out that job disappeared at Macalester, but I was at the right place anyway. And so, that's how I got to St. Olaf.

Q: What was the department like when you got there?

TV: When I got there it was interesting because Lynn Steen was obviously sort of an intellectual power in that department. It was clear to me the day I interviewed there that he was the star. He'd been there several years because in 1970 he went on sabbatical, and he went to the Mittag-Leffler Institute. Now Lynn had a reputation of being the most abstract person. Steen and Seebach were considered sort of a pair, and they were both very abstract, and not at all interested in applications. The more abstract things were, the better they liked them. I knew that was going to be an issue because I kind of like applications, and I had this physics background. I think one reason they might have hired me so quickly was I did have a physics background, and there were some problems between the math and physics departments over the tone of our courses. Well, my first year when Lynn wasn't there, the dynamics of the department changed quite a bit. There were now at least as many people who thought applications were good. We made some changes in the curriculum, which I assumed would go away when Lynn got back. And Lynn, when he was at Mittag-Leffler, studied a lot of the works of the giants in mathematics. And he came back with the idea, he had this epiphany, that all the really important developments in mathematics were not made to solve an abstract idea, but to solve a real problem. And we have to make sure that behind all this stuff there were real problems. When Lynn got back, we started talking about the major. I was very interested in St. Olaf as they had about as many majors then, they had about eighteen a year, as they did in Milwaukee. And I asked them about how it was we had so many majors, and I remember as if it was yesterday, Lynn saying, "Well, at a liberal arts college you have to major in something. You know, there are no professional schools here, we don't even run pre-professional programs. You have to major in something." And that discussion morphed into "What's the best thing to major in for a student who doesn't know what she wants to do?" And we all thought, of course, mathematics because you can use it everywhere. After several department meetings we had this exciting idea of "wait a minute, we should let people know about this." We had some very good students in those early days. And as a young faculty, we were attractive to students; they liked us as people.

Then Lynn had another discovery, that I think had a lot to do with our successes there. Lynn had come in one day and said out of nowhere, "You know, the number of students in a given class who take mathematics every term is a monotone decreasing sequence. Every term you lose some of them." And he was concerned about the students who were going to be with us for three terms. He says, "Is all we want them to learn calculus? Is calculus so central to what we do that we don't even teach them to do anything but calculus for three terms?"

Well, I was teaching the honors multi-variable course. And I taught a baby linear algebra course to my multi-variable students so we could appropriate notation, we could use matrices, talk about derivatives. And I said, "Let's teach linear algebra first." Then if you want to go off and do something like economics, well you've seen linear algebra. And I can I use it in multi-variable calculus. Everybody said, "yeah, why not?" And I'm convinced that of all the decisions we made when we were just going to upset the apple-cart and see how things go, that was the best one. Linear algebra is such a wonderful subject and most students in those days started with a full year of calculus. Linear algebra was first semester sophomore year. But we would have 75 kids in linear algebra. And there's more 'aha' moments in linear algebra than any course before or after. St. Olaf had a very, very strong pre-med program full of bright students that like math and science, and normally they were taking organic chemistry alongside linear algebra. Now, I'm here to tell you, one of those courses is more fun than the other. And I think we seduced half the pre-meds into becoming math majors.

Q: So, did you intend to seduce people?

TV: After a while we did. St. Olaf graduates 700 people a year and we had eighteen majors in the math department. To get into a school like St. Olaf, these kids are good at everything. Why don't we see if we

can get more of those students studying math? There's selfishness about this and I don't understand why programs who turn up their noses at half their majors don't understand this: when you have more majors, you have more students, and when you have more students, you have more classes, and when you have more classes, you get more faculty. That's how your department grows, but it starts with getting more students. If all the students go away at the end of their required one course, well, then you'll be stuck with six, seven people. There were seven faculty in the department when I started. And when I was done being chairman there were eighteen in the department. And that was strictly a tribute to the number of majors. More and more majors meant our majors' classes grew and we were running abstract algebra courses with twenty-five or thirty students.

With more majors, we could run seminars, too. I taught stochastic processes three of four times when I was at St. Olaf. In the days when everybody has to cut back their offerings, the goodies go away, and that's too bad. It feeds on itself. But we decided back when it went from eighteen to thirty-five then thirty-five to fifty that we had something going here.

Also, there is a kind of geek factor about being a math major. I was a math/physics double, there's nothing geekier than that. But, when there are fifty or sixty or seventy kids in a class majoring in mathematics, ten percent or more of the graduating class, that kills the geek factor. It actually became fashionable to be a math major. Now, it was not unanimous that we wanted more majors because, as one of my colleagues pointed out more times than I can count, "you know, if you've got fifty math majors, you've got twenty-five in the bottom half." We got lots of kids who were studying mathematics simply because they liked it, not because they had been told they're really good at it, and the more we massaged our major, the less it became a pre-graduate major. We wanted breadth; we were a liberal arts college, and we promoted double majors. You're an economics major? Well of course you want to be a math major. Physics majors are a given, chemistry majors, maybe. But economics… it became the biggest double major on the campus – economics and mathematics.

Q: Was this a very conscious effort that you weren't training for graduate school anymore?

TV: Yeah, but there were two reasons for it. One, we didn't think that's what our job was. Secondly, so few of the students in anybody's class go to graduate school that you can't focus your program on those few students. They will rise to the top in almost any program. And, everything changed in graduate mathematics in the early 1970's. The jobs stopped. Richard Nixon needed money to run the hidden war in Laos and Cambodia – he eliminated all the research money, the Air Force money, all the grants that were out there that went through the Pentagon. That money went away so he had to get that money from other things; he killed all this research money. In Minnesota when I was there, one-third of the faculty were on some sort of government-sponsored grant. Well, when the grants went away, those people all had to go back in the classroom, which meant there were no jobs for new people. And this happened very soon after I went to St. Olaf. There just weren't any jobs anymore. So, you weren't doing students any favor by saying, "Oh, you really should go to graduate school and get out there and see if you can find work." That made us think we were okay not to focus on graduate school. And still, in spite of this, St. Olaf became the sixth largest school for people to get their PhD in mathematics. The kids who want to go to graduate school, or feel like they have to go to graduate school, have to go to graduate school.

Q: Were your colleagues still teaching classes so that kids could go to graduate school?

TV: Oh yeah, the tone of the classes was pre-graduate. A couple people, that's all that they wanted to teach. And they're the people that had to be sort of massaged to go along with this. But, as the number of students grew, the excitement level grew, and the last one of my colleagues was willing to give up his dream of having only research mathematicians around him; I was never convinced that anything was lost. I mean some of my favorite students were C or B students. They had no idea of going to graduate school,

but they just liked mathematics. Kids were taking complex analysis for no reason other than it was just an interesting subject. You gotta like kids like that, kids who find complex analysis a beautiful subject.

Q: So did you just sit at department meetings going, "What the heck is going on? We've got fifty majors this year" I mean you didn't consciously set out to get 100 majors in a year.

TV: No, it snowballed on us; we were never aiming for 100 majors. We came up with something called a "Contract Major in Mathematics," which was considered revolutionary on the face of it, but it wasn't revolutionary in terms of how it operated. A student would come in and say, "I want to double major in chemistry" and then you'd say "Well, you really need to take differential equations and you should take linear algebra, blah blah blah." There were five courses you had to take, and five you got to pick from. Even that wasn't fixed; we told students they could propose any contract they wanted, but hardly any of them came up with anything creative at all. It was a very important philosophical thing because when a student came in and said, "Dr Vessey, I think I want to major in [something]," we'd say, "Go get a contract form, bring it back, and we'll talk about this." And it was this period when you and the student planned his or her major; I told them, "It's not written in ink, we'll change it if you have to, but let's start out this way. And let's keep in touch." They really had this sense of belonging.

Also, the St. Olaf Math Department had a lot of student graders; we were the second-largest employer on campus behind the food service. In fact, we put in the contract that you have to do something outside class: tutor, grade papers. It got very hard to find something for them to do after a while but we wanted them to feel that mathematics was an activity more than just a collection of courses. And I think we sold that.

We thought it was important to rotate courses among the faculty; in fact, to avoid a dispute about who would get to teach linear algebra (or some other popular course) next, if you taught a course once you had absolutely priority to teach it a second time because everyone wants to teach a second time. But then if you taught thrice, you went to the back of the row. And then anybody else could have that course. And we encouraged, almost demanded, that people teach across the curriculum for several reasons. One was just that you learn a lot more about linear algebra when you teach differential equations and you learn a lot more about differential equations when you teach linear algebra. You become a better mathematician, and we wanted our students to see us as broadly-trained mathematicians, not 'he's an analyst, he's an algebraist.' I suspect the only area that didn't participate in this was computer science, as a group. But, I think it was important. Looking back, that was a very good idea. You always brought some new perspectives to the course. I had a lot of admiration for people that knew how to do it.

Q: So you grew insanely during the 1970's, is that when all this happened? You went from seven to twelve faculty in the seventies, you doubled?

TV: I was chairman from 1975 to 1985 and then again from 1987 through 1990. And it just grew incrementally.

Our faculty manual, like everybody else's, lists three aspects of a good faculty member: teaching, professional activity, and service to the college. Those weren't equal in our department. First, we wanted somebody who came with the reputation of being a good teacher. But, not all those people lived up to their reputations. People had to have a certain sense of professional activity and be active; service to the department came easy because there was so much to do for the department. We pay a lot of attention to what students said about their teachers. I have often said that the reason why we got to be where we got to be was that we hired very carefully. We really did. And Cliff would always shoot back "Yes, and we fired carefully, too." We had some very promising young people who students said they didn't relate to, and it was important to us that students liked their teachers.

Q: Could you tell during an interview who was going to fit?

TV: Not every time. But we could tell when people weren't going to fit. I remember picking a guy up at the airport, and before I got to make a left turn on Cedar Ave, I knew it was going to be a mistake. He said things that made it clear that there's no way, short of a frontal lobotomy, that he was going to change his mind about in a couple years. And I had three days with this guy. We made some mistakes, but we corrected them. We hired some very good people. And then we got to the point where we had two or three people on sabbatical every year. We had a whole slew of temporary folks that I would kill to have kept but we couldn't, we were tenured pretty tight. But, we never felt guilty about hiring people who had great promise because our experience was that after you've been at St. Olaf, you could get a job almost anywhere. Hiring was very important. And the candidate had to understand what it was we were trying to do. Not everybody did.

Q: It's not just what happened at St. Olaf; the people in your department were a big part of your success: they were out there editing MAA publications, being MAA President, being Problems Editor, there's all this amazing stuff that they're doing.

TV: Well, years ago we had to come up with a departmental statement on what was professional activity. The easiest thing would have been to count pages in journals. However, Lynn Steen, who everybody knew was an incredible asset to our department, published one, count it one, research paper. He and Arthur published the *Counterexamples in Topology* book based on a summer institute URP. But Lynn was writing absolutely pivotal papers that appeared in the *Monthly* or appeared in *Scientific American* and we knew that what he did was important. So we said what we really want people to do was to be active. Doing things and getting out there and of course they should have some results that people can look at, but it was not just counting research papers.

I think that if Ken May hadn't asked Lynn Steen and Arthur Seebach to help out with the *Telegraphic Reviews,* maybe our whole fortune would have been different. It was a lot of publicity, and it works. Lynn Steen, based on his brilliant writing, became President of the MAA. And then, you know, Lynn is so bright and so organized that he became a tremendous power in mathematics education. Lynn's out there, and it always says "Lynn Steen, St. Olaf College." Well, that gave us tremendous public image, and everybody who's anybody would come to St. Olaf. For a period of ten years, we had every significant mathematician in American who was interested in mathematics education come and visit us. And then Loren Larson started getting involved with the problems, and he became Problems Editor for *Math Magazine*. And we were doing *Telegraphic Reviews*, so between Carleton and St. Olaf every decent mathematics book written in a twenty-year period went into our libraries. This was a real asset to our department to identify closely with the MAA. We accepted that as professional activity.

A lot of our history goes back to Lynn Steen and you know "you gotta major in something" and "do you really want to have three calculus courses." Not all Lynn's ideas were great ideas. Someone once asked me what was the hardest part of being chairman. I said "Lynn Steen." They said "Why?" I said, "He's in my office every morning, he's got three ideas. One of them is brilliant, one of them is nonsense, and one of them might work and that's the one you think about all day long because he's coming back tomorrow."

Q: Lynn Steen told us that one reason he wanted to come to St. Olaf was that he saw that the senior members of the department were all going to retire soon, and there was the opportunity to build something.

TV: Steen came and the next year Loren Larson and Arthur Seebach came and now you've got three young very active people, and I joined them three years later. We were in charge of our own destiny I

think. It was serendipitous; I mean, who would have thought. There were a lot of things that came together, like the perfect storm. You know, we only had one person that disagreed and thought we were wrong all the way through, and he simply lost his power in the department because everyone else was so busy in the department doing the things we wanted to do. Then the department grew, and I was able to hire with this view of the department we had in mind. If you can't hire, it's awfully hard to get people to change what they do, to change their views.

Q: So when you do departmental reviews for other math programs. What do you give as advice to the other departments?

TV: We look to find out if there is a person out there who considers it his job to protect the virginity of mathematics - to drive anybody but the A students away because that's killer. I mean, killer even if you don't want to have a lot of students. It's an unpleasant thing to do, and mathematics should not be in the hands of a few people. It's just too wonderful of a subject, too powerful of a subject, too interesting of a subject. And we look and see if they're thinking of changing their curriculum in any way at all. We don't even tell them how to change their curriculum, you have to look at your courses. People who write their own books and then insist on teaching it can be a real problem because they're set in their ways; they're not going to change anything, they're not going to listen to people. I've had people who've visited with me go back to their departments with all these ideas and the departments say, "I'm not changing, I've done it this way for the past 25 years and I've got 20 years to go, and I'm going to do it the same way." That's discouraging. I remember visiting a small college in Illinois, and they were really good people but nobody was doing anything. They were teaching their classes, their students like them, but they hadn't had a really new thought. So our suggestion was that all of them do something, probably starting with MAA summer workshops, and learn a new subject even if they couldn't teach it. Just go learn some mathematics. I've heard from those people; they all embraced the idea of trying to recapture the excitement they had when they were graduate students.

Three of us department chairmen back in, I suppose it was the late 1980s, were on a panel in New Orleans, talking about the three programs that we were chairs of. It was St. Olaf, a small public university, and a large public university. They had large, successful undergraduate programs in mathematics. We talked about what we did, and someone said, "It seems like you people spend a lot of time eating with your students." We had a turkey roast in a fall, we had a pig roast in the spring, we had all this food. I talked about the To Be Or Not To Be event [a fun-filled hour telling potential majors the importance and joy of mathematics and the possibilities it creates for future careers], which is something I think is really worth doing: the students will get fired up because you're fired up, and they look around and there's a room with a 150 seats that are full of people wanting to major in math. When professional opportunities came along for our colleagues, we would ask, "Is there any way this is going to benefit our students?" If so, we say yes! Now a lot of schools won't do that because there's no publication at the end of it, there's no payoff, but if we see a benefit for our students, we'll do it. We also spend a lot of time with your students, not just in class. Humke was a great hire because Humke is one of those guys who genuinely likes to talk to people. Here's, arguably, one of the best research mathematicians in the country. He never worried about how he was going to handle getting professional work done – he's written 75 papers – but still he's out there talking to students, encouraging students, having them come out to his house. I think those are important things.