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Interview with Dr. Johnny W. Lott (JL)

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by

Dan Finch (DF)

DF: My first question to you, before we even get into the particular is let's do specifics, not even particulars. Where and when did you get your degrees?

JL: I got my first degree at Union University in 1965, Jackson, Tennessee, and the second one, it was a Bachelor of Science degree, and the second one was a bachelor, excuse me, was a Master of Arts in Teaching degree from Emory in 1969 in Mathematics Education. And then the last one was a Ph.D. in math ed from Georgia State University in 1973.

DF: Ok, you knew those right off the top of your head. Most people have to think about it for a while.

JL: Not exactly off the top of my head, but…

DF: All right, as you think back, was there a most influential person who helped you go into the mathematics field?

JL: Yes.

DF: If so, you know, how did he or she do that?

JL: I had a great high school math teacher, Mildred Majors. And she was without a doubt a super influence on me. When I went to college, I always knew that I would major in math. I didn't know what I would do with it. But I always knew that I would major in math. She was a fantastic teacher, and I appreciated her immensely. And I went back and told her that about 25 years later.

DF: Really?

JL: She didn't know who I was, but I went back and told her anyway.

DF: Still nice to hear; still nice to hear. Well, after that, after your degrees, obviously you wound up here at The University of Montana. What led you to decide that? Some sort of strange factors or not too many?

JL: I like to claim it was just fate. I went to a National Council of Teachers of Mathematics meeting in Atlantic City, New Jersey, and met Rick Billstein and Shlomo Libeskind. They had a 3x5 card up on a board advertising a job in math ed for one year, when Shlomo was going to go on leave and go to Israel to the Technion for a year. I talked with them in their hotel room for about 20 minutes, and they were busy and about to go somewhere else. I was about to meet some people for dinner, and that was kind of the end of the conversation. I went back to Atlanta where I was living, and Carolyn and I laughed about it. One, we almost didn't know where Montana was. Two, we knew we'd never heard of Mazola, not Missoula, and finally though, when the job got offered, we said sure, we can live anywhere for 9 months. It was a visiting appointment. So, I stayed for 9 months. Had a great year. They offered the job for a second nine months visiting because Shlomo wanted to stay two years in Israel at this point. At that stage, we had decided we pretty much liked Missoula, but I was still applying for other jobs. But we liked the people here. We liked the community in the math department, and during that second year, I got offered a tenure track job by the department. So, I came for 9 months and stayed nearly 26 years.

DF: Not what you expected.

JL: Not at all, what I expected. But it worked out well.

DF: That's good. But it worked out well.. .That's great. Well, then since you've been in the department for that amount of time, obviously you've seen it change. Can you see, can you identify some of those changes?

JL: Sure.

DF: Like, you know what, and what do you think of them maybe? If you're willing to go that far.

JL: For many, many years, there was only one faculty member who had been here less time than I had. Hien Nguyen, he came the second year I was here. Okay. And for about 12 years, we were the two faculty members on this staff with the least amount of time on campus.

DF: Oh, on campus.

JL: No, excuse me, just in the department. I'm talking about in the department.

DF: Ok.

JL: But one of the things that has been a definite change over the 26 years is the turnover of staff. It is in the process of completely changing since the time I got here. Several of the people have retired in the past 5 to 6 years, and there are many more of them coming up. Because there are a good many people now in the department who can retire. So, one of the major changes is to watch new faculty members with new ideas come in here. I think it's very positive. We needed that to happen, and it's about time for me to take off too. So, it needs to happen again. But I do think that, that it's been positive. It's been positive for the department, it's been positive to see ideas come in here, it's been positive to have new mathematics come in here. We didn't have operations research when I first got here. I think the first operations research, and I know that's your area, but I think the first operations research courses officially kind of got here the second year I was here. When, Hien Nguyen. So, that's something that's been pretty positive. We've lost some things over the years too. Sometimes when faculty members have left, we haven't been able to replace them necessarily with the types of people that we wanted. An example might be Frank Wang who was here early on when I got here. He was a probabilist and a statistician, but more of a probabilist, and he kind of mixed the two areas. And it's, we've never truly had another probabilist-type person here. We've had more statisticians, but where they haven't had quite the interest that Frank had. But Frank was able to kind of bridge the two areas of mathematics. That's not to put any of the faculty members down that are here now, but... This has been kind of a unique place in that it, for a small department, it's had a pretty good mix of people who aren't local people necessarily. I mean, it's had, it's been almost common international community. It has not until more recent times had enough women, probably, in the department. But, it's changed in that regard, and we've made an active effort in the last few searches at least to try to find women to fill the positions. And I think as time goes on, that'll change and help the department too.

DF: So, do you think there's a reason why faculty tend to stay here? I'm not sure every department around. does that happen, and do you think the new faculty will have the same sort of tenure if you will, in the department?

JL: It's hard to say, there have been a few people who have left, you know, over the years, have come and stayed not too many years. I'm not, I don't know. The reason I think people have stayed in the past certainly is not because of salaries, because the salaries are fairly pathetic. But, of all the places that I've ever been in math departments, even though we may not

always get along with one another, this has been a pretty friendly, easy-going department where people have pretty much respected other people's ideas. That hasn't happened where I've been at other places. Emory when I was there, shortly after I left, the department had a battle basically and split up. The same thing, same type of thing under different circumstances happened at Georgia State. I haven't seen that happen here, and I don't mean that everybody has always been bosom buddies with everybody else, but there's been kind of a sense of community in the math department that's been here over the years that I think is kind of unique. At least it doesn't happen in every place anyway.

DF: True.

JL: And I think that's important, I think that's kept people here. The other thing, and this has to do with, somewhat with respecting other faculty members, but faculty members have been given a lot of freedom here to do what they want to do. And, I know I have always been allowed to do pretty much what I want to do in this department. And being in mathematics education in a department of mathematics, that had potential for real problems, and it could've had real problems at other places, but here, the department members have I think, have respected me and let me do what I wanted to do. So, I've appreciated that, and I hope the new faculty members are receiving that kind of treatment, because I think that's one of the things, the collegiality of the department and the respect of your colleagues goes a long way toward keeping people around here.

DF: Yeah, but the reason I asked that because this may or may not be the same answer to the next question that I have, which would be, you know if there is one thing that you think about one good asset, one, something to have the department to hang their hat on. Do we have a singular best asset, or is it an accumulation of them?

JL: I can answer that in two or three different ways. One of the ways that I would answer that question is for me, personally, finding someone with whom I could work in mathematics education over a long period of time was super important. And Rick Billstein and I have been able to do that for many, many years. We haven't always agreed on everything, but we have been writing articles in books together for over 20 years now. We've given talks together, we've taught classes together, more so in some of the earlier years than we're doing right now because our interests have diverged some, but just having a colleague like that with whom I could work has been a tremendous asset for me. For the department as a whole, probably the best asset that it's had over all these years is, generally speaking, the ability of having the students and the faculty be able to talk to each other. The department's small enough that basically everybody knows everybody else. I think that's important too. So, if I had to pick out a single kind of asset, for the whole department as a whole, it almost has to be that one. Because people do know each other, and they generally know what each other's doing.

DF: Right.

JL: That's not always the case in terms of research and things like that, but generally speaking, we know what each other's doing. I think that's pretty helpful. Probably one of the best assets this department's got. It's had a graduate program that is not huge, it had some good undergraduates, and I think having faculty that know many of the students has helped. Kind of wandered on that, but... that's the way I feel about it anyway.

DF: That's what happens. Well, since you've mentioned your obvious interest in math education. Some people are goal oriented; some people aren't. You mentioned it was important for you to have a colleague to work with, but as you've gone through your years, has there been a goal that you have always wanted to achieve, or a series of them, you know, have you done it, or do they change to much to say, ok, check that one off my list let's go to the next one?

JL: It's pretty interesting.. .Years and years ago, a colleague from Helena and I were sitting around having a beer and talking one day, and saying we'd like to have some major kind of National Science Foundation curriculum project to be the swan's song. Well, I got to do that with SIMMS [Systemic Initiative for Montana Mathematics and Science]. It just came a few years to early, but that truly was a goal, forever. Rick and I had a goal of working on an elementary school curriculum to see if we could make some changes in it. Together we wrote the grant that eventually became the STEM [Six through Eight Mathematics] Project, and because I was also involved with writing the SIMMS Project grant at the same time, when they were both funded the same year, a decision had to get made. And I wound up with the SIMMS Project and he wound up with the STEM Project, so we kind of got our goals in some respect, although not exactly where we had expected them to be. It was a real shock to get two major grants at the same time, and it's kind of like having the best of all worlds and the worst of all worlds. Yes, you got what you wanted, but you got too much of it.

DF: That's right, how am I ever going get it done.

JL: But I mean, that was a goal. I mean, and it was for me, at least, a stated goal at one point in my career to kind of do that kind of thing. There have been some other things that I have wanted to do. I tried very hard to write a geometry book, and had a contract to write it, wrote enough of it that I could teach out of it about three times, and decided it was a disaster. So, it's sitting over in the filing cabinet. So, there have been a few goals that obviously have not been met, and never will be, because I'll never finish it. I figured if I couldn't teach out of it, nobody could. And...

DF: You are your own worst critic.

JL: So, there have been some things like that. And for what's coming up, I mean, there's still a few that I want to get done. I'm working on a National Council of Teachers of Math Project right now called the Figure This! Campaign, and it's got another couple of years to go. I am about to start working this coming week as the editor of the secondary mathematics portion of the Addenda series that will go with the new standards of NCTM that will be published

next April. And it'll be a series of books, probably six of them. [Telephone rings.] One of the other good goals that came out of the SIMMS Project is working with people like Maurice Burke at Montana State. I found my colleague there to be super knowledgeable and easy to communicate with. So, one of the assets, particularly for the math ed community that this place has had for me, is the ability to work with other math educators across this state. Glenn Allinger and Maurice Burke, Lyle Anderson, three in particular are outstanding people, and I'd rank them with anybody anywhere in the country. So, that's been pretty wonderful.

DF: Tell me, I don't know why, what is Figure Disk Campaign?

JL: Figure This!.

DF: Figure This! Thank you.

JL: Right. The National Council of Teachers of Mathematics got a grant from the National Science Foundation and the Department of Education to write materials that could be used with middle school kids and their families at home. And it's coming out in a print version and also a web version. And this is something, it's one of the first times that those two government agencies have really tried to work together to do something. And I mean really work together with their hands in it, not just give the money and say 'bring us a product when you're done.' And I'm the project manager for the National Council of Teachers of Math side of it, and we will produce about 80 problems that can be used with kids and their families. The first 15 are done, and we'll continue over the next couple of years to try to do the other, whatever it is, 65. So…

DF: Sure, over a variety of topics?

JL: It's, pretty vague directions from the Department of Ed. and National Science Foundation because their supposed to cover all of mathematics that kids might see in middle school, and, but they're a series of distinct, individual problems.

DF: Ok.

JL: So, it's kind of challenge. There are about 15 writers from across the country. There's a chair of the writing committee from Boston University. My immediate boss on the project is from the National Research Council. And the three of us manage the writing of the product and then hand it off to a public relations firm who are doing the design and printing of it. And it's all done in coordination with the National Action Council for Minorities in Engineering in New York. So, the three groups, the public relations firm, the National Council of Teachers of Math, and NACME, the National Action Council for Minorities in Engineering are working to produce this stuff, and we have a web site where it's available by web, or people can call and get it for free, so.

DF: That's great.

JL: It's, takes up a considerable amount of time, so. I've got another year or so, to work on it.

DF: Just the traveling alone, I'm sure. Well, then as we've discussed the changes in you work itself, as we've broadened the scope, and say, so how has math, or how have the courses in math been changed? Or how do you expect it to continue to change? I don't think many people think nothing has changed, but.

JL: Personally, in math ed over the time that I've been here, lots of things have changed. I will talk only about mathematics education courses, but we have been instrumental since I've been here in putting calculators and technology in for the perspective elementary teacher math courses. Those were not there when I first came here. In fact, I worked with a graduate student many years ago now, on one of the very first calculator studies in elementary schools. And it was financed in a very small way by the Montana Council of Teachers of Mathematics. It was one of the very first studies that was done using grades 2, 4, and 6 I think. That was a long time ago, but based on what we learned in that study, we put calculators into those classes. One of the next things that came along, Rick, Shlomo, and I received a grant from the National Science Foundation where we learned how to use Logo when it was in its infancy. And we incorporated Logo into those classes, okay. And got some of the very first computers that were on this campus. They were Apple II's. Eventually we got Apple II+'s and Apple 2 E's, and all sorts of other things. But those were some of the very first ones that we had around here for general use with kids. And we had a lab where they could get to them and use the Logo in that lab. One of the next things that has happened that grew out of the SIMMS Project was we put, kind of the first multiple use computer labs in the department, specifically for mathematics teacher education use, but then more generally we got money from the University to put them in for all math people's use. And one of the things that's grown out of that is our Math 401 class for secondary teachers, Math Modeling with Technology, which is about to be revised and renumbered as Math 301. The intent was always to let students learn how to use the technology to the point the point that they might be able to use it in their other classes. So, it's going from a 400-level course to next year, I guess it'll be a 300-level course. And, so, I mean, those are some technological changes that I think I've helped and with other people to be instrumental in getting that done, and I did not do it alone by any stretch of the imagination. But, that's a big change in a math department.

DF: Yeah.

JL: I bought my first calculator for that calculator study in about 1976, and now every department, I mean every department member has a computer sitting on their desk, and we've come a long way. I think it's changed the way we write mathematics. I think it's changed the way many of us think about mathematics. I think it is slowly changing the way we teach it. That's been an unbelievable change in a fairly short period of time, 26 years. But where we went from having almost no technology. Charles Bryan had one of the early pieces of technology, and it was the, the equivalent now would probably be a $1.95 Calculator that you could buy at K-Mart, but I think that initial calculator cost about $1500

for this department, and that was early on when I got here. I think that's changed. I think the use of the computer and computer lessons even to do traditional type mathematics and the way it's delivered and the way students turn in homework, I think all that's changed math a lot. There are things you can do in mathematics now that you could not do without that technology. I mean, that's not taking anything away from the theory; that's just plain thinking about big numbers or small numbers, or numbers or operations that you simply couldn't deal with by hand, they took too long. You couldn't even approximate it then. One of the big changes in the mathematics itself that I think is coming is going to be the use of recursive formulas more and more and more, because lots of spreadsheets use that kind of formula. And I think that's going to change certainly some of the lower division type math courses. It's almost the same kind of revolution you got when you're talking about a slide rule. You know, many, many years ago, which is, they were popular when I was an undergraduate. You know, now you would never catch anybody with a slide rule, but most everybody has some kind of calculator, graphics calculator of some kind, and a computer, or computer accessibility. We didn't have that before, and it's going to, I think it's changing the mathematics we teach and how we teach it, both. Probably at some point, we'll do away with it, more of the drill, and that's going to be I think one of the bigger challenges for university math departments.

DF: Sure.

JL: . i s to decide what is it you can throw away and not lose anything, or not lose much. And there'll be more and new stuff that comes along. Pretty exciting time actually. In the past it took roughly a hundred years to get anything incorporated into mathematics. I mean, here we are the computer is what, 60 years old, and.

DF: And look how prevalent it is.

JL: But in 60 years it's gone from being an instrument of the government in war departments and things like that, to being accessible to nearly everybody. It's a lot faster than some of those hundred year changes. So.

DF: Yeah. Two questions, with absolutely no relation to each other, but as we're still thinking of maybe the future here, and we're in a new century, would you have an idea as to what might be included on a new list for the new century if Hilbert were to come back from the grave and know all that was to happen, but something for a new list of Hilbert problems?

JL: I have a hard time with that. I'm not enough into research mathematics probably to answer that question. So, I don't have a good one.

DF: Alright, fair enough. That's great. So, my last question, which is a good summary because in one question you can incorporate a lot of things, but you wouldn't of stayed doing what you're doing unless you enjoyed it. I don't think. Whether that be as a teacher or doing your research or a combination of the two, but do you have a favorite memory or anecdote that

you, when people say why do you do what you do, and in the back of your mind something clicks and you think, jeez, you know?

JL: It's an interesting question. My wife and I had this conversation not long ago, and the question that we were thinking about is, 'What would we change if could go back and redo any of it?' And the truth of the matter is 'very little.' Very, very little. When I think about my time here at the university, not all the memories are good. I mean, I can distinctly remember the first talk I gave after I was a faculty member here, and I gave it at Washington State. I got invited to come over and give a colloquium. Unfortunately, they wound up being on a holiday, not having any students. There were about 8 faculty members that showed up in an amphitheater type room, and the talk was a disaster, and included in that was the fact that we had a blizzard that night as well.

DF: To make matters worse.

JL: If I hadn't had another talk scheduled for the very next day at Eastern Washington, where it turned out to be a really good experience, all except driving in the snow storm to get there following a snow plow, I'm not sure I would have remained in mathematics education another year. One of the good things that happened out of that was I came back and talked to Howard Reinhardt who was one of the faculty members here, and he gave me some good words of encouragement, and said, 'okay, chalk one up as being a very bad experience, see if you can get beyond it,' you know, and helped a little in trying to do that. It's one of those experiences that without a doubt kept me in it, and at this university, and I tried to tell Howard that in later years, but I don't know that I ever got that totally across, but it's something I'll never forget. Wasn't a great experience, but it was one that certainly lasted with me. And there have been many other with Rick and Shlomo in traveling, going to math ed meetings and being on the road. Watching Shlomo with his interesting diets that he had over the years, and Rick's reaction to him, and Shlomo's reaction to the world. Watching other faculty members in their interactions with people here, some of them visiting some of them permanent are pretty incredible stories, some of which aren't worth repeating, but watching a visiting faculty member occupy a tenure-track faculty member's office for a year and going in one day and finding a rotten apple stuck between two books. There are little snippets that you can sort of pick out that are interesting. The people in the math office have made, over the years, this place be alive. Vera Hanner when I got here, Valerie Crepeau who came, I describe her as a child. She and I got here about....? (Tape ends).