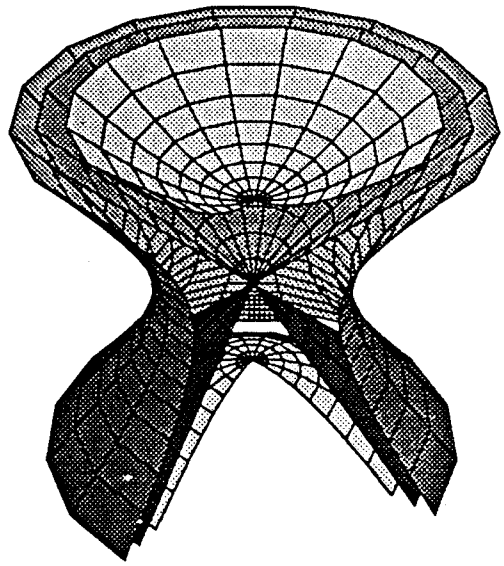

MATHEMATICS & STATISTICS DEPARTMENT
ALUMNI NEWSLETTER
UNIVERSITY OF MISSOURI-ROLLA

HISTORY OF MATHEMATICS DEPARTMENT

Our last Newsletter began with a short account of the history of the MSM-UMR Mathematics Department, covering the period from the beginning of the Missouri School of Mines and Metallurgy to, but not including the tenure of nationally known and highly respected Professor GEORGE REINALD DEAN - student, teacher, and finally department chairman from 1888 to 1930. Much of this has been taken from Professor CLAIR V. MANN'S "The History of Missouri School of Mines and Metallurgy", published in 1941 by the Phelps County Historical Society.

Before recognizing Mr. Dean's accomplishments, it would be well to state that after the previously noted hectic years 1878-1882, Professor E. D. W. EATON led the department until 1888, when the directorship of C. E. WAIT ended. Director Wait's administration awarded thirty-nine degrees - all as either Civil Engineer or Mine Engineer. Again, we remember the mathematics department was not, as such, "degree granting", except in one or two unusual cases, until 1962, when now Professor JAMES M. JOINER, who held degrees from Southeast Missouri State University and the University of Chicago, was awarded MSM's first Masters Degree in Applied Mathematics. (Later, upon leave of absence, he attained the doctorate at George Peabody/Vanderbilt, returned to UMR to serve us admirably - not only as a mathematician but as a linguist who works with our many Spanish speaking students to the extent that he has been highly honored by one or more of the governments of our Spanish American countries.)

To back up, in 1888 WILLIAM HOLDING ECHOLS, JR., B.Sc., C.E. became director. What is interesting here is that Director Echols was an accomplished mathematician who, upon resignation from MSM in 1891, went to the University of Virginia, where he chaired the mathematics

department for many years. So, as to be expected, the rather "hodge-podge" MSM mathematics department became more "mature" during his stay here. It was actually called the department of "pure" mathematics, although still only a service department for engineers, and part of a general science program as well.

Coincident with Director Echols' arrival in 1888, a most fortunate event occurred. From Waterloo, Illinois, across the river from St. Louis, came one of MSM's most brilliant and highly esteemed students, who entered as a freshman and who almost immediately became faculty as well, GEORGE REINALD DEAN. Dean had been one of several high school students who learned mathematics through the calculus and physics, by help of a Professor PELTIER, and who had actually taught himself chemistry and some medicine before entering college. So it seemed obvious that this young man, if he were to remain at MSM, would make great contributions to its fledgling mathematics department. Remain he did - and an entire volume could be written about his academic experiences and accomplishments until his retirement as chairman, and later teacher, in 1935.

Mr. Dean, already well versed in mathematics and physics and other sciences, and Director Echols, also mathematically minded, undoubtably worked together to form a stronger, more "up-to-date" mathematics curriculum.

Starting in 1888, eight regular courses of instruction made up the MSM offerings. One of these was "Mathematics and Physics." It was this program of study that Mr. Dean followed to his graduation with the Bachelor of Science degree in 1891, having previously received the degree Civil Engineer in 1890. His Mathematics and Physics degree was essentially electrical engineering oriented. It was soon, however, abolished.

After his graduation in 1891, Mr. Dean left Rolla with Director Echols for the University of Virginia, where he served as a laboratory fellow and assistant at the University of Virginia Astronomical Complex. He further gained more teaching experience in two or three institutions until 1897.

During this period, another strong mathematician, a faculty member of MSM, WALTER BUCK RICHARDS was appointed director, remaining also as Professor of Mathematics and teaching foreign languages upon occasion. Since he had been recommended to this position by previous Director Echols, it is only logical to assume that Mr. Dean's expertise in practically every scientific academic endeavor was well known to him. Thus Director Richards was instrumental in bringing Mr. Dean back to his Alma Mater as Professor of Mathematics in 1897, when he with two others, one Assistant Professor and one Instructor, formed the department. The next Director, C. E. LADD, termed Professor Dean "a teaching genius".

The General Electric Company had, in the early 1900's, the services of CHARLES PROTEUS STEINMETZ, a man small in stature but huge in brains. It was inevitable that the paths of Doctor Steinmetz and Professor Dean would cross at some point. Probably no better scientific and engineering combination had ever existed than the collaboration of the mathematical genius of Professor Dean and the electrical wizardry of Steinmetz. Together, their solutions of new problems resulted largely from Professor Dean's study for his baccalaurate degree in the MSM "Mathematics and Physics" curriculum, although it was actually electrical engineering. But apparently political decisions elsewhere than Rolla made it impossible to refer to it as such.

Superb teacher that he was, Professor Dean was quite active in the Mathematical Association of America, as can be ascertained by browsing through earlier volumes of the MAA journal.

The usual departmental changes occured during Professor Dean's chairmanship because of demand. Probably the most important in early years was the separation of Theoretical and Applied Mechanics courses which had been taught by the mathematics department, to eventually form the Engineering Mechanics department as it now exists. This change was probably brought about by Professor LEON ELLIS GARRETT, who was Associate Professor of Mathematics under Dean until 1916, after which he headed the

Department of Mechanics. Professor Garrett eventually became Acting Director of the School in 1913. Director Garrett, still serving under Professor Dean, was also undoubtedly responsible for the inclusion of courses in engineering in addition to mining, metallurgical and civil, as well as enhancing the mathematics program as necessary to keep it in line with other engineering service departments across the country.

As earlier indicated, Professor Dean was a great teacher as well as a great scholar. This writer came on the scene just three years after he passed away and well remembers the reverence he was awarded by his colleagues. He had many teaching "tricks", later being known as the "eraser thrower". In his time, and until the close of the Curtis Laws Wilson administration in 1964, all mathematics classes were small. One excellent teaching procedure involved sending the students to the blackboard (such may still be to case in recitation hours of large classes) so that the instructors could analyze each individual''s progress as he worked assigned problems at the board. Probably ninety percent of walls in each mathematics classroom were covered with blackboards.

Of course the purpose was for the teacher to spot an error and call it, forcibly or otherwise, to the student's attention, and to offer the remedy therefor. In a simple example - suppose at 8 a.m. a sleepy, groggy student was assigned $\int \frac{dx}{x}$. Not having prepared himself, he may well write $\int \frac{dx}{x} = \frac{2}{x^2}$, since he already knew $\int x\,dx = \frac{x^2}{2}$, and $\frac{1}{x}$ being the reciprocal of x, its integral must be the reciprocal of the integral of x. Good thinking, perhaps, but for some reason or other Professor Dean wouldn't agree, and the offending student's head immediately became a target for an eraser, hurled by the good professor from the center of the room with the accuracy and speed of his namesake, the great St. Louis Cardinals pitcher "Dizzy" Dean. Fortunately, the erasers were of the soft kind - there were no injuries and no student resentment. Conversations with old grads confined their love and respect for this great man whose classroom antics helped them so much to learn well the mathematics necessary to engineers.

Professor and Acting Director Garrett, under and over whom Dean served, wanted to make the Missouri School of Mines well known to people outside the engineering world by producing a winning football team. That he was successful is quite obvious: in 1913 the Miners total was 265 points to 60 for the opponents, the only loss being University of Missouri (now UMC) 44, MSM 14. However, the 1914 team scored 540 points to opponent zero, including Washington University (19-0), Arkansas University (40-0), University of Missouri (9-0), Pittsburg (Kansas) (104-0) and St. Louis University (63-0). While this revelation has little to do with mathematics department history, it is part of the story of MSM and so worth inclusion. All the football players either were taking or had taken mathematics courses.

Professor Dean, having served through several administrations, was succeeded as Chairman in 1930 by Professor VAN BUREN HINSCH (BS in EM, 1909; E. M., 1917 both MSM. In the meantime the school had gradually increased in offerings and student body numbers to its most stable curriculum picture ever. These were eight curriculums: Mine, Metallurgy, Civil, Mechanical, Electrical, Chemical, Ceramics and Science - all but the last being engineering. The Science category was just that, but was not too frequently elected. Majors and minors had been introduced, and presumably the courses were most often used for transfer or, in many cases, by public school teachers who needed certain science or mathematics courses for certification or for advanced knowledge in their fields. For some years, a summer session for teachers of sciences and mathematics was actually carried on by the regular faculty, supplemented by experts in Education from Columbia.

Professor Hinsch, a rather large and very kind man, chaired the department, until his death in 1942. Professor Dean had continued to teach from 1930 until 1935,

became Professor Emeritus at that time. His health deteriorated and he passed away in August, 1937. By this time, while the mathematics department remained very strong as a service department, it had actually become a smaller part of the whole school, which had grown considerably in both numbers of departments and courses, and in corresponding faculty as well.

In 1940, when this writer first arrived at MSM, the regular mathematics program for all engineering students consisted of Trigonometry (5 semester hours); Analytical Geometry with a little calculus thrown in at the end (5 hours); Differential Calculus (4 hours) and Integral Calculus (4 hours). Elementary Ordinary Differential Equations (3 hours) was offered, but few students other than EE's took it since no others were required to do so. A few other courses were offered upon demand, and added by 1944. These were called, at various times, Advanced Analytic Geometry, Intermediate Calculus, Theory of Equations, Partial Differential Equations (called at one time "Fourier Series and Harmonic Analysis") and a "catch-all" course called Advanced Mathematics. Needless to say, few students enrolled in these more advanced courses - sometimes only two or three, and the instructor just added one of these courses to his regular schedule of 15 to 16 hours.

The mathematics department in 1940 consisted of six members: Professor Hinsch, Chairman; Associate Professor R. M. RANKLIN (AB Maryville College (Tennessee), AM University of Chicago, CE MSM); Associate Professor F. E. DENNIE (BS in CE, Brown), who had previously been football coach but for health reasons was transferred to a more sedentary endeavor; Assistant Professor E. A. GOODHUE (AB Amhberst , BS California Institute of Technology, MS MSM) and Instructors RALPH EIKELBERGER (AM Hays State) and E. E. JOHNSON (BS in CE, Nebraska). Mr. Johnson soon resigned and later became Dean of Engineering at the University of South Dakota.

It is clear that most members of the mathematics staff held engineering degrees as well as strong training in mathematics. This was, of course, a rather necessary thing because the staff's main purpose was to prepare engineers mathematically. But at this point there began a gradual change in its makeup, necessitated by various things such as World War II and its aftermath and the ensuing new developments in engineering that required the use of more sophisticated mathematical procedures. We shall continue the history from here in the 1992-93 Newsletter.

ALUMNI NEWS

Professors MAXWELL ENGLEHARDT and MIN MING TANG are still on leave. Professor V. A. SAMARANAYAKE, who was on Sabbatical in the Philippines, and Professor SELDEN TRIMBLE, who was on personal leave, has returned to us.

New this year to the tenure-track staff is Assistant Professor TIMOTHY RANDOLPH (Ph.D., Oregon, '90), who was Visiting Assistant Professor here last year. He and Professor SARAH HOLTE "tied the knot" this past summer, and they have our very best wishes.

It was brought out in the last Newsletter that Dean MARVIN BARKER had resigned, with Professor GLEN HADDOCK appointed Interim Dean of the College of Arts and Sciences. That vacancy has been filled by Dean JOHN D. FULTON (Ph.D., Mathematics, North Carolina State University), who comes to Rolla from the Deanship of the College of Arts and Sciences of the University of West Florida. Dean Fulton, after a year as Research Associate at Oak Ridge, joined the mathematics department of Clemson, rose in rank from Assistant Professor in 1967 to full Professor in 1976 and Chairman in 1978. Welcome aboard, Dean Fulton!

Professor Haddock is again on leave from the mathematics department to be Interim Vice-Chancellor to Interim Chancellor JOHN PARK.

Two well deserved promotions within the department took place this year. MARTHA GRISHAM, Secretary and Senior Secretary to the department since 1977, has been named Administrative Assistant. Associate Professor LEON HALL was advanced to full Professor.

Professor Hall is Immediate Past Chairman of the Mathematical Association of America-Missouri section.

Giving papers at the 1991 annual Joint Meeting of AMS and MAA in San Francisco were Professors HOLTE, SINGER, INSALL, AND HALL. Professor Hall also attended the Mathematical Conference on "Mathematica" at that convention.

Professor SINGER received an AWM-NSF travel grant and AMS stipend to attend AMS Summer Research Institute in "Algebraic Groups and Their Generalizations" July 8-26, 1991 at State College, Pennsylvania. She later solved a problem she had worked on for eight years, and submitted a paper describing the result, "More Results on Kac-Moody Subspace Products". A colloquium talk here, also, was presented on that topic in October by her.

Professor EUGENE M. INSALL has a paper entitled "Some Finiteness Conditions in Lattices Using Non-standard Proof Methods" that is to be published in the Journal of the Australian Mathematical Society.

At a special session at the summer AMS meeting in Orono, Maine, Professor TOM INGRAM presented a joint paper with M. BARGE of Montana State University entitled "Inverse Limits on [0,1] with Logistic Bonding Maps". Professor HOLTE also talked there: "Full Attracting Sets of Annulus Maps Which are Inverse Limits of Circles".

An innovative inservice teacher training program is being developed by Professors HADDOCK, HALL, AND ROE for the Satellite Educational Resources Consortium (SERC) in cooperation with Kansas City Public Television. The programs are available to schools in Missouri and other states that are members of SERC, and will be carried by satellite to these and by some public television stations on Thursdays from 3:00 to 4:00 (Central Time) as follows: Hall will give "Spirograph Mathematics" on January 9, and "What Good is a Square Wheel" January 16. Haddock follows with "Math Modeling" on January 13, and Roe wraps up with "Chaotic Dynamical Systems" on January 30.

On October 5, the MSM/UMR Alumni Association presented its Alumni Achievement Award to Astronaut TOM AKERS (B.S., M.S., UMR) for his outstanding contributions to many endeavors - especially the NASA space program.

National attention has been given to UMR's doctoral program especially as it refers to granting degrees to women. According to the American Mathematical Society, we were tied for fourth in the nation in terms of mathematics doctorates awarded to women in the 1980's. According to Professor TROY L. HICKS, who is in charge of recruitment of graduate students, our doctoral candidates have "teaching opportunities not available to students in large mathematics programs". They get to teach a wider variety of courses than they may at other places, and they have the "plus" of getting to know their professors better. "This year, UMR's mathematics department has 29 graduate students including 16 women" writes Professor Hicks, while "sixteen of the department's 34 undergraduate students are women."

We are glad to again hear from JOHN C. KILLINGER, (B.S. Math '73, M.S. Engr. Mgt. '80), Senior Research Associate with Texaco in Houston. He writes that he and Marybeth had their "second child, Joseph Matthew, on February 15, 1991." Sister Catherine is three and one-half. John earned the MS in Petroleum Engineering from Tulane in May '91. John lives at 14823 Preston Park Drive, Houston, TX 77095.

KEVIN T. DAVIS (B.S. Applied Mathematics '86) is working in the Naval Nuclear Propulsion Program. Agency regulations, Kevin complains, "are more convoluted than calculus proofs." His home is 214 Tennessee Avenue, Alexandria, Virginia 22305

Another Houston resident is AMY MARIE LAMPAZZI (B.S. '86), 16102 Seahorse, Houston, TX 77062. Amy is continuing with graduate study at the University of Houston-Clear Lake, and enjoying staying home with two year old son, Peter. Visit us when you can, Amy.

JOHN L. WILLIAMS (M.S. Applied Math, '77) 8613 La Sala Del Centro NE, Albuquerque, NM 87111, is a member of the technical staff of Sandia National Labs, serving as division supervisor of Satellite Data

Systems. His wife Melina teaches in the public schools, son Jim is a senior in high school, Mindy an 8th grader, and Piper a first grader. He enjoys working with two other UMR graduates, DON ROUNDTREE (Ph.D., comp. sci. '79) and DAVE COX (M.S. comp. sci. '83).

Programming Architect for IBM is DAVID F. OBERMANN (B.S. '78, M.S. '80), 470L Ridge Oak Drive, Austin, TX 78731. His most important news is the arrival of their first child, Luke August, in March 1990. Other highlights: three weeks in Europe (courtesy of IBM) and a 3-day bike tour. He celebrates 10 years at IBM and also 10 years as co-host of a radio program "Folkways". David says, "Hello to all".

The UMR Mathematics department is always happy to hear of the accomplishments of its graduates. So please do continue to keepus informed-we appreciate your interest in you Alma Mater, whether it be accounts of your progress, monetary or other types of gifts-in short, just anything about you to make us feel the pleasure of having been some small measure of help to you in achieving your successful goals.

Our thanks to the secretarial staff, Martha Grisham and Carleen Humphrey, for their efforts in getting this newsletter produced and into your hands. Without their help it would not have happened.

Don't forget our

Phon-a-thon

is scheduled for

January 15-16, 1992

COMMENTS FROM THE CHAIR

I find it difficult to believe that I am already beginning my third year here at UMR. It seems like only yesterday that I sat here at my Macintosh and wondered what I should say to the alumni of this university with which I had decided to cast my lot. I knew of UMR by reputation, but I had very little first-hand knowledge of the department. My wife and I are reasonably well settled in Rolla--we have built a home here and we have even unpacked most of the boxes we moved here from Texas. I now even know a number of our alumni by their first names, and some of them I have taught in a course or two here. I like what I see of the students and the graduates of this institution. I especially appreciate the support we receive from you. When invited to do so, alumni have been willing to come to campus to talk to our current students about how they are using mathematics or statistics in their jobs. The department is equipped with a fax machine through the generosity of an alumnus. There are several endowed scholarships available for mathematics majors from funds set up by alumni. In December of last year, just as we were about to break for Christmas, the department received an anonymous, unrestricted gift of $10,000. If you have been reading my comments for the last two years, you know that I am committed to endowing as much of the money that is given to us as I possibly can. The faculty of the department have concurred in this and, as of this writing, I am pleased to report to you that the Board of Curators has accepted our recommendations and created two endowments for the department. The anonymous gift has been used to endow a contingency fund for the department from which we will be able to purchase items which we might ordinarily have to do without. The second endowment has been created entirely from alumni donations which we have allowed to accumulate over the past three years. It is called the Alumni Scholarship Fund and can be used to assist students coming to UMR to major in mathematics. One special provision of the Alumni Scholarship Fund is that we may give preference to a mathematics major who is a daughter or son of an alumnus in the awarding of this scholarship. It is not a large scholarship (approximately $550 per year),but, as the parent of a UMR student, I know how much even $550 could help out. Creation of an endowment requires an initial investment of $10,000. The funds are invested by the Board of Curators so that some of the income is returned to the corpus of the fund to keep it from being eroded over time by inflation. Once a fund is created, the return in spendable funds is approximately 5.5%. If the recent generosity of the alumni continues, we will soon have another $10,000 from which we will be able to create another endowment or enhance the ones we already have. The department has plans to give this year's donors a chance to speak on the use of their donations. I hope you will include us among your contributions this year and that you will participate in our survey. Of course, we would be happy to hear from any of you at any time, and whenever you are in the vicinity of the campus, please drop by the department for a visit. You will likely find a familiar face or two around the department, and, naturally, I would be delighted to meet you.

I hope you have enjoyed this issue of the department's newsletter. Please keep us informed of your activities so that we can pass them on to all the alumni. This newsletter has resulted from the hard work and dedication of Professor Dickran Erkielatian. Our special thanks to him for his efforts in getting it put together. I hope you enjoyed his second installment in the history of the department at UMR.

Note: The image in the header of this newsletter was generated by Mathematica and it shows a relationship between quadric surfaces.