Massey Announces Shift in Structure of NSF Grants

National Science Foundation (NSF) Director Walter Massey, in his address at the MAA's Seventy-Fifth Annual Meeting in Baltimore, 8–11 January 1992, announced his intention to extend the average length and raise the average amount of NSF grants, indicating that three years should be the average duration of an NSF grant. Such a change would, Massey acknowledged, lead to fewer grants being awarded. The impact of such a shift will depend on how it is approached by the individual divisions of the Foundation.

While it is unclear how the proposal would ultimately affect the mathematics community, Massey noted its reliance on the NSF. According to a recent survey, almost ninety percent of all mathematicians who received a PhD in the past seven years and are currently employed in an academic institution say they are engaged in research, and over forty percent of mathematics doctorates active in academic research report receiving federal support for their research.

Still on the subject of mathematics research, Massey also observed that funding still favors the individual researcher, with some sixty percent of spending going to support projects initiated by a single investigator and the much-publicized NSF research centers taking only six percent of the budget.

The remarks on research funding followed a generally favorable analysis of the present state of the mathematics profession. "I think it is safe to say that the long-term health of science is very closely tied to the health of mathematics," Massey began. And then later: "In the past decade we have seen mathematicians respond to questions about priorities in teaching and research with careful study and quality analysis. The willingness of the mathematics community to undertake critical assessments of strengths and shortcomings is evident in the landmark work of the *David Reports (I and II)*; and such publications as *Everybody Counts* and *Moving Beyond Myths*." Praising the mathematics societies for not seeking to advance their own interests, but advocating instead across-the-board support for mathematics, science, and engineering, the NSF Director then went on to mention developments in the teaching of mathematics.

"Among the successes in mathematics at NSF are the efforts that are going into projects at improving mathematics teaching and curriculum development. I am particularly pleased with the excitement generated by our Calculus Curriculum Development program . . . . I think that any observer would give the mathematics community very high marks for its recognition of the need to improve mathematics education and its willingness to work toward this goal at every level, from kindergarten through graduate education. This effort must continue—as each of us has a personal stake in the success of K–12 education." ∎

Mathematics Goes Public

Barrett Gives Retiring Presidential Address
Calls for Women to Change the Rules

"Mathematics makes its case—who we are" was a possible title for her lecture, declared Lida K. Barrett, at the start of her *Retiring Presidential Address* to the MAA during the Association's Seventy-Fifth Annual Meeting in Baltimore, 8–11 January 1992. "Mathematics goes public" was another, she suggested.

She began by observing that the mathematics community has been particularly diligent in assessing itself over the past decade or so, with nine major reports appearing since 1980 alone:

■ the two *David Reports* on mathematics research from the National Academy of Science (NAS), entitled *Mathematics: A Critical Resource for the Future* and *Renewing US Mathematics: A Plan for the 1990s;*

■ the series on issues in education from the National Council of Teachers of Mathematics (NCTM) that commenced with the 1980 *Agenda for Action: Recommendations for School Mathematics for the 1980s;*

■ several reports from the Committee on the Mathematical Sciences in the Year 2000 (MS2000) of the National Research Council, including *Everybody Counts: A Report to the Nation on the Future of Mathematics Education; A Challenge of Numbers: People in the Mathematical Sciences;* and *Moving Beyond Myths: Revitalizing Undergraduate Mathematics;* and

■ the MAA's recent *A Call for Change: Recommendations for the Mathematical Preparation of Teachers of Mathematics.*

Referring to this last report, Barrett said: "As college professors, we have to realize that we are past 'chalk and talk.' We must use alternatives to the lecture method. The most powerful form of teacher training is the kind of teaching that potential teachers experience in their college classrooms. *A Call for Change* is a basic document which should help us revolutionize not only the way we teach teachers, but the way we teach all our mathematics students."

For evidence that the mathematics community has taken these various reports to heart, Barrett looked at the 1992 MAA Annual Meeting itself, comparing the 1981 Annual Meeting in San Francisco with the 1992 Annual Meeting in Baltimore at which she was speaking. In 1981, the MAA meeting was, Barrett noted, separate from and preceded by the AMS meeting. The total MAA program consisted of five, one-hour invited talks and was held jointly with the NCTM. By and large, the focus was on research at the AMS meeting and on education at the MAA meeting.

"We as the mathematics community have gone public. We have laid out for ourselves a future course of action .... I look forward to our community continuing to move ahead ...."

(Barrett Address continued from front page.)
The 1992 event was quite different. First of all, the two meetings— that of the MAA and of the AMS—were completely intertwined, and it was often not at all clear which event "belonged" to which organization. There were panels on how to start a colloquium, on preparing teachers of mathematics, on strengthening underrepresented minorities in mathematics, on how to cut down on the drop-out rate among graduate students, and on how to change graduate programs to be more receptive to women and minorities. There were talks on employment and on values and rewards in the mathematics profession. There were seventeen minicourses to enable mathematicians to broaden their knowledge of the subject. And our awareness of making new entrants into the profession feel welcome manifested itself in the first-ever *Reception for First-Time Attendees* at a joint meeting. *(See "Baltimore Highlights" on this page, below for additional details on the meeting.)*

Picking up on the issue of making the mathematics community more receptive to women, Barrett, who was the second woman president of the MAA, declared:

"For too long, we've tried to encourage women into the field and then we've told them to learn how to play the game the way that men have played it and by the rules they have long established. We must change the rules and the culture and make it a warmer, happier, and more inclusive place for women and minorities. My sincere hope is that the next generation of female mathematicians will not have to accommodate, as I did, to a white, male culture; and that the culture will be broader and more inclusive and a happier and less threatening place for women and minorities."

Returning to her main theme, Barrett also noted that at the same time as we have been raising our own professional standards, we have been working towards improving the image of mathematics and mathematicians among the general public and striving to make our voices heard in Washington. Referring to the national educational goals, *America 2000,* announced by President Bush last year, Barrett noted with pride that ". . . when the National Governors' Association and the White House sent out a call for input on what the goals should be, [the] NCTM, MAA, and AMS came forth with the suggestions on mathematics and science education that found their way into the list of goals."

"We as the mathematics community have gone public," Barrett concluded. "We have laid out for ourselves a future course of action. We have begun this action in a broad and thoughtful manner; we are beginning to move ahead to being first in the world in mathematics and science education by the year 2000. I look forward to our community continuing to move ahead—by not only setting standards and an agenda for school mathematics and mathematics education, but also for doctoral mathematics and doctoral education for the year 2000 and beyond. I look forward to our working together as a united community to address our needs at all levels." ■

Lida K. Barrett is now Senior Advisor on Precollege Education at the National Science Foundation.

1992 Chauvenet Prize Awarded to Steven G. Krantz

The 1992 Chauvenet Prize was awarded to Steven G. Krantz of Washington University in Saint Louis for his paper, "What Is Several Complex Variables?" which appeared in the *American Mathematical Monthly* **94** (1987): 236–256.

The Chauvenet Prize is awarded annually for a piece of expository writing published by the MAA. Krantz received his award in Baltimore on 10 January 1992 during the Seventy-Fifth Annual Meeting of the MAA.

Born in Missouri in 1951, Krantz received his undergraduate education at the University of California at Santa Cruz and, in 1971, earned his PhD under E.M. Stein at Princeton University. He has been a professor at Washington University since 1986 and has written numerous books and papers, including the 1990 MAA Carus Monograph *Complex Analysis: The Geometric Viewpoint.*

In his prizewinning article, Krantz provides a highly readable account of a fascinating and wide-ranging subject, giving self-contained proofs of several gems, and enabling a reader, prepared only with a first course in complex analysis, to obtain a good sense of the field, including areas of current research interest. ■

Baltimore Highlights

The lectures, the committee meetings, and the book and software fair were there, of course, as was the opportunity to meet up with old friends from across the country and occasionally around the world. But attendees at the Seventy-Fifth Annual Meeting in Baltimore, 8–11 January 1992, came away with a number of other memories. Apart from the events mentioned elsewhere in this month's FOCUS, the following activities all met with great success:

The first-ever *Reception for First-Time Attendees* at the winter meetings drew some four hundred people, both MAA newcomers and long-time members. MAA Secretary Kenneth A. Ross extended greetings to all on behalf of the MAA and the American Mathematical Society (AMS). Because of the success of this event, it is likely to be repeated at future winter meetings.

The National Security Agency premiered its new mathematics video, *You're Gonna Need Those Numbers.* The video will be available for purchase in early May 1992.

Exxon announced its award of $50,000 towards publication of *Math Horizons,* a new MAA magazine directed at students.

And on MAA matters, the MAA Book Sale brought in revenues of $21,000, by far the largest sales figures achieved at a national meeting of the Association. ■

Steen Wins Distinguished Service Award

Lynn Arthur Steen, Professor of Mathematics at St. Olaf College in Northfield, Minnesota and President of the MAA in 1985–1986, has received the Association's Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service. No stranger to either MAA members or the educational establishment in Washington, DC and elsewhere, Steen accepted the award in person at the MAA's Seventy-Fifth Annual Meeting in Baltimore, 8–11 January 1992. An expanded version of the official citation read at the award ceremony appears in the *American Mathematical Monthly* **99** (1992): 99 and 100. In accepting the award, Steen presented a brief response, which is printed below.

Response

Lynn Arthur Steen

I am deeply honored by this award and all it represents. It is truly a privilege to be associated through the Award for Distinguished Service with the many previous winners whose work has so enriched mathematics and mathematics education.

I express my special gratitude, both personally and on behalf of the MAA, to Dr. and Mrs. Hu for their generous gift that enabled the Association to endow the Award for Distinguished Service. Their support of mathematics, even as relative outsiders to the field, is a marvelous example of generosity and public spirit. Their gesture signals to all of us the value of what we do. I accept this award in that spirit, as a symbol of the importance of the work of the MAA, and as an incentive to redouble our efforts.

I feel very fortunate to have been elected President of the MAA just as the tide of public interest in mathematics and science education was beginning to rise. My term as president-elect began one year after publication of *A Nation at Risk* and one year before Macintosh computers began to invade our campuses. The resulting tide began to raise all boats, not least the MAA and other professional organizations. For example:

- The Education Directorate at the National Science Foundation (NSF) was revived from near extinction.

- The National Academy of Sciences (NAS) established the Mathematical Sciences Education Board (MSEB).

- The Joint Policy Board for Mathematics (JPBM) established its Office of Governmental and Public Affairs (OGPA).

- The National Council of Teachers of Mathematics (NCTM) published the nation's first-ever *Standards* for school mathematics.

Increased vigor is evident also in mathematics, both in research and in curriculum:

- The revolution in discrete and computer mathematics gave rise to the counterrevolution in calculus reform.

- The power of computer-assisted visualization has transformed mathematical practice and helped fuel a renaissance in geometry and data analysis.

- For the first time ever, aspects of advanced mathematics—chaos and fractals—have become household words.

It has been great fun to work in an environment so rich with opportunities and so ripe for constructive engagement. In every direction one looks, there are new groups riding the rising tide, new opportunities, and new challenges. Now science is following the lead of mathematics, with groups hard at work to establish standards for school science and to elevate the level of scientific literacy of our nation.
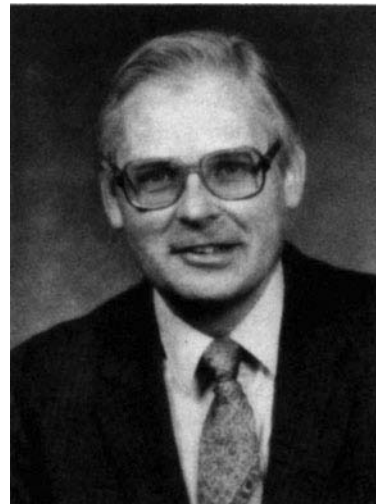
Nearly ten years after *A Nation at Risk*, the mathematical community is much closer to a common vision of what works in mathematics education. In this sense, although controversy still remains, we are now more truly a *community* than ever before. Indeed, building communities is what education is all about.

My work has always been embedded in communities—at St. Olaf, with the MAA, for MSEB, the Conference Board on Mathematical Sciences (CBMS), and the Council of Scientific Society Presidents (CSSP). I have been aided in more ways than I can remember or acknowledge by members of these communities. For me, this award symbolizes the value of building community in our common work.

Of course, committees are created by individuals. On this occasion I think especially about the contributions to building communities of the three most recent winners of the Distinguished Service Award—Shirley A. Hill, Leon A. Henkin, and Ivan Niven. I feel fortunate to have had the chance to work with each of these individuals in various capacities, especially in MSEB, the American Association for the Advancement of Science (AAAS), and the MAA. I have learned from them, and others, the value of inclusiveness, of joining into common cause individuals of different backgrounds and perspectives.

I especially want to thank two others who taught me, and the rest of the mathematical world, the value of building community:

- Kenneth M. Hoffman, for his persistent stimulation and career-long mentorship; and

- Marcia P. Sward, for her unfailing energy and contagious enthusiasm.

Finally, I thank members of my local community for sustained support despite my repeated absences. St. Olaf College has provided an exemplary undergraduate community, a place where values of education and good scholarship remain in good balance. My work has been generously supported by St. Olaf and tolerated by my wife and family with forbearance and humor.

So thank you again for this award. Let us all take up the challenge it represents—to redouble efforts to build a strong and inclusive community in which mathematics is truly for all.   ■

Secretary's Report

<div align="right">Gerald L. Alexanderson</div>

The Seventy-Fifth Annual Meeting of the Association, held jointly with the American Mathematical Society (AMS) and other organizations in Baltimore, 8–11 January 1992, was remarkably successful, with attendance running over 3,500. The site was particularly inviting, with excellent facilities and a number of attractions in the area that provided good breaks from the scientific sessions, the committee meetings, and other formal activities. The Board of Governors met on 7 January 1992 for a full day of business and discussion. Two hours of that meeting were devoted to the work of the Strategic Planning Task Force. The membership will be hearing more of strategic planning over the next few months.

The Board approved, pending receipt of some additional funding, a new undergraduate periodical called *Math Horizons*. For additional information concerning this proposed magazine, see page twenty-eight of the June–July 1991 issue of FOCUS.

Two new governors-at-large were elected by the Board at this meeting: Johnny L. Houston to replace Sylvia T. Bozeman as the governor to represent minorities, and Eric R. Muller to replace Peter D. Taylor as the governor to represent the Canadian membership. The Board also reelected John W. Kenelly as one of the two elected members of the Finance Committee.

John D. Fulton, Chair of the Committee on Guidelines, presented to the Board a draft of a set of *Guidelines for Departments of Mathematics.* These guidelines include some statements that will certainly provoke discussion within departments and between departments and administrators. The governors commented at some length on the draft; Professor Fulton is taking these suggestions and comments back to his committee for further discussion and review. Members of the Association interested in such guidelines should feel free to contact their Section governor about these issues.

Some members have, no doubt, wondered why it takes so long after they cast ballots to learn who has been elected to the positions of President-Elect and First and Second Vice President. The current *Bylaws* state that "This ballot shall be mailed to the membership approximately eight months before the annual meeting and voting shall close four months prior to the annual business meeting." This meant, in practice, that the ballots have been mailed out in April or May and we did not learn the results until September. This made it impossible to invite officers-elect to attend meetings of the Board of Governors or the Executive and Finance Committees at the summer meetings prior to taking office.

This year the firm that conducts our elections for us recommended that the period between distribution of ballots and the date they are due back in our Washington, DC headquarters be shortened to six weeks. The company provided data to show that almost all ballots are returned during the first six weeks of the election. An ad hoc Committee on Elections met at the Orono meeting and recommended that the period be roughly eight weeks in order to allow some additional time for foreign members to return their ballots and to accommodate people who are on leave during the spring term. The section of the ballot quoted above would then read: "This ballot shall be mailed to the membership by approximately April 1 of an election year; returned ballots must be postmarked prior to June 1." This proposal was endorsed by the Executive and Finance Committees and the Board approved the change in Baltimore. It will be taken before the membership at the business meeting in San Antonio, Texas in January 1993.

At the Prize Session and Business Meeting, the fiftieth anniversary of the book, *What is Mathematics?* by Richard Courant and Herbert Robbins, was recognized by the Association. This recognition was prompted by the fact that this book "exemplifies much of what the Association has stood for over the years: outstanding exposition of mathematical ideas, made accessible to a wide audience. It demonstrates the beauty and power of mathematics." In addition, John H. Ewing, the first Pólya Lecturer, was recognized. Certificates of Meritorious Service were presented to: James C. Bradford of the Texas Section; Franklin S. Brenneman of the Kansas Section; Robert Gilmer of the Florida Section; Delia Koo of the Michigan Section; A. Duane Porter of the Rocky Mountain Section; and James J. Tattersall of the Northeastern Section. The 1992 Chauvenet Prize was presented to Steven G. Krantz of Washington University in Saint Louis and the Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics was presented to Lynn Arthur Steen of St. Olaf College. Additional details on these various awards appear elsewhere in this issue of FOCUS.

John W. Kenelly, who heads the Building Fund Drive, provided the membership with a very positive and encouraging report on the projected success of the drive for the restoration of the Washington, DC headquarters buildings.   ∎

Career Fair Declared a Hit

Bernice Kastner

Eyebrows rose at the Seventy-Fifth Annual Meeting in Baltimore, Maryland on 9 January 1992, when groups of middle and high school students attended Simon A. Levin's invited address, *Problems of Scale in Ecology.* These were some of the 493 precollege students whose teachers responded to the invitation offered by the MAA to plan a field trip for their students in connection with the introduction of a new event sponsored by the Committee on Student Chapters—a career fair. A grant of $9,500 from the Exxon Education Foundation helped to underwrite the development costs of this new activity.

The career fair provided an opportunity for prospective employers of mathematically trained people to make the academic mathematics community, both faculty and students, more aware of the needs of such employers and of the variety of career opportunities available to people with strong mathematics backgrounds. Seventeen companies, government agencies, and organizations, as well as four members of the Committee on Mathematicians Outside Academia (CMOA), participated in the career fair. Representatives were on hand from insurance companies such as USF&G and Metlife; utility companies such as PEPCO, Baltimore Gas and Electric, and AT&T; and other companies such as Eastman Kodak, W.R. Grace, Bendix Field Engineering, and Program Resources, Inc., the manager of the supercomputer facility at the National Cancer Institute. The Social Security and Health Care Financing Administrations, as well as NASA's Goddard Space Flight Center, the National Security Agency, and the Environmental Protection Agency were among the government agencies which participated. The Operations Research Society of America (ORSA) and the Casualty Actuaries of the Mid-Atlantic Region also sent representatives.

CMOA members who participated were: Patrick D. McCray of Searle Pharmaceuticals, Leon H. Seitelman of Pratt & Whitney, Burton H. Colvin of the National Institute of Standards and Technology, and Robert James Thompson of Sandia National Laboratories.

In addition to the many regular meeting registrants who attended the career fair, the 493 precollege students were brought by 40 high school mathematics teachers and 8 parent chaperones. Fifty-five undergraduate students, many of whom were freshman or sophomores, also took advantage of the special, one-day registration.

It is anticipated that the career fair will become a regular feature of the annual meetings so that local high school and undergraduate students in different parts of the country can have the opportunity to receive this kind of career information. Several college and high school teachers called or wrote after the meeting to encourage continuation of this event. As one teacher explained:

"On Thursday, 9 January, I attended the Joint Mathematics Meetings with thirty-seven of my high school students. We applaud your suggestion of attending the special program for high school students, and hope that this type of effort will continue. I particularly want my students to be exposed to information about mathematics careers and to have access to mathematics professionals." ∎

Student Papers Sought

Pi Mu Epsilon and the Student Chapters of the MAA will sponsor a joint summer meeting at Miami University in Oxford, Ohio, 5–8 August 1992. A number of *MAA Undergraduate Student Paper Sessions* are scheduled. Nominations for fifteen-minute papers from Sections of the MAA, departments of mathematics, and other interested parties, along with brief abstracts, should be sent to: Ronald F. Barnes, Department of Applied Mathematical Sciences, University of Houston-Downtown, One Main Street, Houston, Texas 77002-1094.

Deadline for nominations and submissions: **15 May 1992.**

The Exxon Education Foundation has provided some funds to help defray student speaker travel costs. ∎

1991 Meritorious Service Award Winners
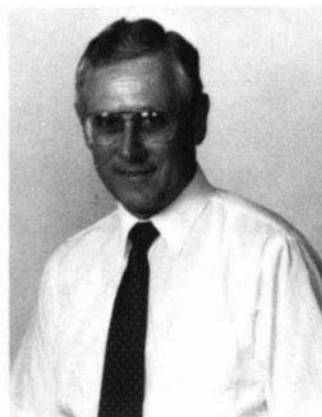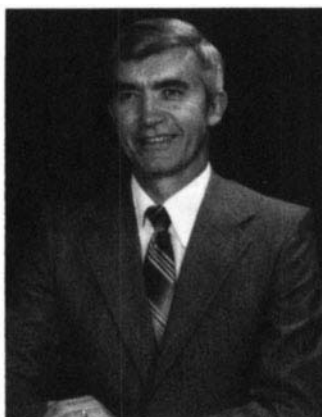
MICHIGAN SECTION

Della Koo
Eastern Michigan University
Ypsilanti, Michigan

Professor Koo received her BA from St. John's University in China in 1941, her AM in 1942, and her PhD in 1947 from Radcliffe College. In addition, she received an MA in 1954 from Michigan State University. She has taught at Eastern Michigan University since 1965, where she holds the rank of professor emerita.

For many years, Professor Koo was an active participant in and leader of Michigan Section activities. She served with distinction as the Section's Secretary-Treasurer, as Vice Chair, as Chair, as an Executive Committee member for nine years, and as Section Governor. She cofounded the *Newsletter of the Michigan Section* and twice served as its editor. She has been on numerous committees and has also served as the MAA Representative from Eastern Michigan University.

FLORIDA SECTION

Robert Gilmer
Florida State University
Tallahassee, Florida

Robert Gilmer received his undergraduate education at Mississippi State University and obtained his PhD at Louisiana State University in 1961. He has taught at Florida State University since 1963, which, in recognition of his outstanding teaching, research, and service, named him Robert O. Lawton Distinguished Professor. He has written over 150 papers.

Professor Gilmer, a renowned authority on the theory of commutative rings, has given unstintingly of his energy and time to further the goals of the MAA. He has participated in the MAA Visiting Lecturer Program and has served as associate editor of the *American Mathematical Monthly*. He has been on numerous committees: the Committee on Publications, the Committee on the Carus Monographs, the Committee on Miscellaneous Publications, the Committee on Lecture Notes, and the Committee on the Beckenbach Book Prize. From 1985 to 1989, he served as Section Governor.

KANSAS SECTION

Franklin S. Brenneman
Tabor College
Hillsboro, Kansas

Franklin S. Brenneman received his BA degree from Goshen College and earned his PhD from Oklahoma State University in 1967.

He has been active in the Kansas Section since 1974. Previous to that time, he was active in the Oklahoma-Arkansas and Eastern Pennsylvania-Delaware Sections, and has attended Section meetings virtually every year since 1964. He has served the Kansas Section as Vice Chair in 1977, Chair in 1978, and Section Governor from 1985 to 1988.

He is very concerned about undergraduate programs in mathematics and the preparation of students for graduate school and for high school teaching and has been an active voice for several years on the subject of raising standards for certification of teachers of mathematics in grades K–12.

NORTHEASTERN SECTION

James J. Tattersall
Providence College
Providence, Rhode Island

James J. Tattersall received his BA from the University of Virginia, his MA from the University of Massachusetts, and, in 1971, he obtained his PhD from the University of Oklahoma. His mathematical interests include geometry, number theory, and the history of mathematics, and he frequently lectures on these topics.

He served as the Host Coordinator for the Northeastern Section in 1983, as the Program Chair in 1988, and in other capacities. He currently serves as the Section's Historian-Archivist and is writing a series of articles on the history of the Northeastern Section. He has been a Visiting Lecturer for the MAA and has served on the AMS-MAA Committee on Short Courses and the AMS-MAA Committee on Employment and Educational Policy.
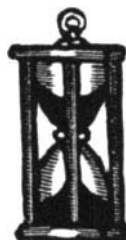
Warning to T_EX Users

Readers who use T_EX to prepare their mathematical documents should be aware that a particularly unpleasant and quite new strain of computer virus has been discovered in several implementations of T_EX.

According to Peter Oldfellow, a computer security consultant at the Stanford Research Institute in Menlo Park, California, the "April virus" (so-called because it is due to be triggered by the computer's internal clock registering 1 April 1992) is quite unlike previously discovered viruses. It does not, as far as anyone can tell, cause permanent damage to stored data, nor even the original text T_EX-input file. What it does is introduce small, but mathematically critical changes to the dvi-file that T_EX outputs to the printer.

By isolating a Sun workstation and then advancing the computer clock by a month, T_EX wizards at Stanford University have been able to detect the following effects of the virus: systematically changing greater-than signs to greater-than-or-equal-to signs; ran-
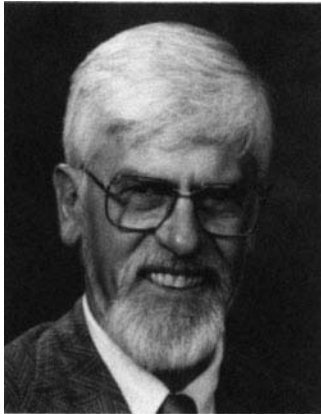
ROCKY MOUNTAIN SECTION

A. Duane Porter
University of Wyoming
Laramie, Wyoming

A. Duane Porter received his undergraduate education at Michigan State University and earned his PhD at the University of Colorado in 1964. He has taught at the University of Wyoming ever since then and has published approximately fifty papers in linear algebra and matrix theory.

A particular interest of Professor Porter's has been mathematics education and he has received three quarters of a million dollars from the National Science Foundation (NSF) in eight grants to further his goal of improving the teaching of mathematics at all levels, from elementary school through university.

Professor Porter joined the MAA in 1964 and has always strongly supported the national organization and the Rocky Mountain Section. He has been Chair of the Section twice and, during 1978–1981, served as Section Governor.

TEXAS SECTION

James C. Bradford
Abilene Christian University
Abilene, Texas

James C. Bradford received his BS and MS degrees from North Texas State University and obtained his PhD from the University of Oklahoma in 1957. With the exception of four years at Teledyne, he has taught at Abilene Christian University ever since then.

He has worked for the Texas Section in several capacities, including Secretary-Treasurer from 1969 to 1978, Section Governor from 1983 to 1986, Chair of the Long-Range Planning Committee from 1986 to 1989, and Public Information Officer from 1979 until the present. At the national level, Professor Bradford has served on the Committee on Sections and the Public Information Panel.

Help Push the Mathematical Center Fund "Over the Top"

Five hundred sixty-five donors have now contributed 85 percent of our $600,000 goal for the MAA Dolciani Mathematical Center Fund. In addition to the $168,000 Pólya bequest, gifts have included both cash and stocks. There have been 111 donors who have given $500 or more, including 37 who have pledged $3,000 or more.

"This has been the most successful fund-raising campaign the Association has conducted," said campaign chairman John W. Kenelly. "But we need to dig deep if we are going to be able to retire our mortgage as planned and put more resources into programs and services, not bricks and mortar. We want to go 'over the top!'"

One objective of this campaign is to name rooms in the Center for mathematicians or family members. At present, room campaigns are in progress for nine living mathematicians: Ralph P. Boas, Howard W. Eves, Rodney T. Hood, Neal McCoy, Walter and Mary Ellen Rudin, Albert W. Tucker, and Alfred B. Willcox. A memorial room is being named for Charles W. Trigg and another room for Viola and Bernard Hank, parents of a member mathematician. In addition, there will be an Authors' Room, supported by gifts from publishers, and a room named for the Michigan Section. The Northeastern Section is largely responsible for the Eves campaign, as is the Wisconsin Section for the Rudin campaign. About two hundred donors have contributed to these special room campaigns.

Many members have made gifts in memory (28) or commemoration of (198) someone—an excellent way to honor mentors, teachers, and colleagues in the mathematical community.

Thanks and appreciation are extended to all those who have made gifts for the Center. Remember, the names of all donors who have made gifts of $300 or more will appear on the Honor Roll of Donors wall plaque and all donors will be listed in the *Register of Donors* book on permanent display in the Center.

Please help us go "over the top" with this important campaign. Rooms are still available for gifts ranging from $5,000 to $25,000. If you are interested in making a major gift or know of someone who might be able to make such a gift, please contact: John W. Kenelly or MAA Executive Director Marcia P. Sward at MAA headquarters, 1529 Eighteenth Street Northwest, Washington, DC 20036-1385; (202) 387-5200; maa@athena.umd.edu. ∎

domly changing positive numbers to negative; interchanging sin and cos. FOCUS readers who use TeX should take particular care to look for these symptoms during the next month.

According to Oldfellow, attempts to eradicate the April virus have so far proved ineffective, so TeX users may have to live with these problems for a while yet. For most users, the new virus will be little more than a minor annoyance, but as Oldfellow points out, "If the virus affects a TeX-ed document that is then used in the design of safety-critical systems, the results could be catastrophic. I wish these pranksters would realize the potential danger of their actions and find some other way to get their intellectual kicks."

(Warning continues on page nineteen.)

The International Congress on Mathematical Education: Its Roots   Eileen L. Poiani

The roots of the International Congresses on Mathematical Education, more popularly known as "ICMEs," trace back to a paper by the group of American commissioners who participated in the first International Commission on the Teaching of Mathematics. It reads as follows:

"The preparation of the reports [on the teaching of mathematics] calls for a comprehensive survey of our educational system in general and of the work in mathematics in detail; for a sketch of the unparalleled activities of recent decades in the development of existent institutions and in the genesis of new ones; [and] for an account ... [of] the reforms that are still under consideration .... Work in mathematics must be regarded and interpreted in the light of its environment, and our reports should furnish the readers of other nations with information respecting our educational system and conditions analogous to that which we shall expect from them ....

America is unique in the liberty left to individual initiative in matters of education, and in the absence of authoritative central legislation and supervision. It is desirable, therefore, that the reports describe clearly the practical working of this freedom and its effect, good and bad, upon our progress in general and in mathematical education."

The goals expressed by these American commissioners ring familiar, although they were written in New York City over eighty years ago (26 and 27 March 1909), just one year after the Fourth International Congress of Mathematicians met in Rome in April 1908 and created the first "International Commission on the Teaching of Mathematics."

Historically, the ICMEs evolved in the following stages:

- In 1905, David Eugene Smith, an American mathematics educator, first proposed, in writing, that there should be an international group to look at mathematics instruction and curriculum.

- The International Commission on the Teaching of Mathematics, created in 1908, was headed by Dr. Felix Klein who remained its president until his death in 1925.

- The International Commission met in fall 1908 with delegates from thirty-three countries and concentrated on a survey of teaching practices. Two world wars interrupted its progress, but the Commission reported on mathematics education at the 1932 and 1936 International Congressess of Mathematicians (ICMs).

- In 1952, the International Commission on Mathematical Instruction (ICMI) became a commission of the newly created International Mathematical Union (IMU), with twenty-seven countries forming their own national committees. The IMU belongs to the International Council of Scientific Unions (ICSU).

  In the US, the National Academy of Sciences (NAS) serves as the national member of ICSU. The US Commission is called the United States Commission on Mathematical Instruction (USCMI) and began in 1952. Today, more than sixty countries have national committees.

- The Chair of USCMI sits on the General Assembly of the ICMI. The Assembly convenes at each ICME.

- USCMI composition has a broad national base of research and education with two members each drawn from the MAA, the National Council of Teachers of Mathematics (NCTM), and the United States National Committee on Mathematicians (USNCM). USNCM is the American liaison for the ICMs.

- Rifts have existed between mathematics researchers and educators. Reports on mathematics education were tucked into ICM programs, but not ordinarily given much attention.

- The need for international congresses focused specifically on mathematics education became evident, leading to the first ICME in 1969 at Lyons with six hundred in attendance. The other ICMEs with participation numbers have been as follows:

    ICME-2 (1972): Exeter (1,400)
    ICME-3 (1976): Karlsruhe (1,800)
    ICME-4 (1980): Berkeley (2,000)
    ICME-5 (1984): Adelaide (2,000)
    ICME-6 (1988): Budapest (2,400).

- Quadrennial congresses are now held regularly. The next, ICME-7, will be held 17–23 August 1992, at the Université Laval, Québec, Canada. 3,000 participants are expected.

Sometimes the only international news on mathematics we read is comparisons of performance on International Assessment Tests. ICMEs go far beyond this level and offer special benefits to the participants and those with whom they interact. ICME-6 provided many networking opportunities for the mathematical community, constructing bridges within a beautiful city of bridges. ICME-7 will build on the previous exchanges and look at new developments in mathematics education. For example, the dynamic changes caused by the dissolution of the Soviet Union should have an impact on how and what is taught in the mathematics classroom.

For additional information on ICME-7, contact: Congrès ICME-7 Congress, Université Laval, Québec, QC, Canada G1K 7P4; (418) 656-7592; ICME-7@VM1.ULAVAL.CA. FAX: (418) 656-2000. Telex: (021) 051-31621 UNILAVAL QBC. Deadline for applications for accommodations: 1 July 1992. See also pages ten and eleven of the September 1991 issue of FOCUS for Jeremy Kilpatrick's discussion of the 1992 ICME program.   ■

Eileen L. Poiani is a Former Chair of the United States Commission on Mathematical Instruction (USCMI) and a professor of mathematics at Saint Peter's College.

A Call from COMET

A CALL FOR CHANGE—One Year Later

The MAA Committee on the Mathematical Education of Teachers (COMET) wishes to collect information about the impact of its document, *A Call for Change*, released one year ago. The Committee is interested in what mathematical sciences departments are doing (or are planning to do) with regard to the mathematical preparation of teachers of mathematics. Have you initiated changes in your courses for prospective elementary school teachers? Do you offer special mathematics courses for teachers intending to teach at the middle-grades level? What changes, in both content and delivery, are taking place in courses for mathematics majors (particularly at the junior-senior level)? Please forward information to: James R. C. Leitzel, Visiting Mathematician, The Mathematical Association of America, 1529 Eighteenth Street Northwest, Washington, DC 20036-1385; cap@hilda.umd.edu.   ■

Mathematics at the AAAS

Keith Devlin

The tour guide stood in front of the Sphinx and addressed the group. "The Sphinx is about five thousand and two years old," he announced proudly. "Where does the extra two come from?" asked a young girl in the group. The guide smiled. "Well," he replied, "I have been a guide here for two years and, when I first came, I was told that the age of the Sphinx was about five thousand years."

The tour guide might have smiled, but readers of FOCUS probably will not, being all too aware that the lack of numerical awareness the story illustrates is all too common among the population at large. Equally dismayed at the present level of innumeracy is Haim Harari from the Weizmann Institute of Science in Israel, who relayed the joke as part of his lunchtime address to the members of the American Association for the Advancement of Science (AAAS) at its 1992 annual meeting, which took place at the Hyatt Regency Hotel in Chicago from 6 to 11 February 1992. The point Harari was trying to put across was that we have to raise the level of mathematical and scientific awareness in society and change the climate, which is all too common at the moment, where a seemingly well-educated person can say, with no shame and usually a smirk of pride, "Oh, I never was very good at mathematics."

One good thing about Harari's talk was that it seemed to be well-attended by journalists. One of the main aims of the AAAS is to bring together not only scientists from different disciplines, to meet, find out what each other is doing, and maybe even exchange ideas, but to bring practitioners in the science and education game into close contact with the journalists who link us to the general public. There was less evidence of a strong journalistic presence at most other mathematically related events, but maybe that too will change in time, as the signs are that things are steadily improving with regards to the perception of mathematics, at least among the other sciences.

Having been asked to organize a special session on *Mathematics and Computers* for the meeting, I took advantage of my position as editor of FOCUS to assign myself the task of attending the entire meeting and then reporting on the mathematics that was offered. There was a lot of it: nine, half-day sessions on *Mathematics, Computer, and Information Processing;* another nine (regrettably in parallel) on *Science and Mathematics Education;* a further session on *Mathematical Modeling and Environmental Concerns;* and a number of one-hour addresses on a variety of mathematical themes. In addition, MAA Executive Director Marcia P. Sward chaired a session on attracting women into science.

It was my first time at the AAAS and I am told that this was by far the best showing yet for mathematicians. As a community, we were slow to plug into the science-media network, leaving it to the physicists, biologists, chemists, and others to make their case with the aid of high-quality, glossy presentations. Clearly, those days are over and some of the best-attended talks at this year's meeting were on mathematical themes. Some indication of past performance and societal expectations may be gleaned from the fact that, for the first three days, the mathematical talks were squeezed into a small room that left many people standing.

One of those who packed a small room to overspill level was Marjorie Senechal of Smith College, who gave a fascinating and well-illustrated talk on the mathematics of crystal formation, bringing in set theory, Penrose tilings, symmetry, group theory, and even talk of projections down from five-dimensional space. The new mathematics Senechal discussed was developed in response to the discovery a few years ago of what are known as "quasi-crystals"—entities that, at the time of their discovery, broke all the known rules of crystal formation, but which exist in spite of that.

Question: how do you define a crystal? The old answer, claimed Senechal, is no longer valid. That old definition said that a crystal is a homogeneous solid with a periodic atomic structure. The new one she proposed in her talk runs like this: a crystal is a homogeneous solid with an essentially discrete diffraction diagram. Though it takes some mathematics to elaborate this to a reasonable level of comprehension, what this amounts to, Senechal observed, is that if something looks like a crystal, then it is a crystal. Since the subject of Senechal's talk concerned real crystals and involved genuine laboratory data, it could equally well have fitted into a number of other sessions, I am tempted to add that if something looks and feels like mathematics, then it is mathematics, and this is a message we should all be spreading as far and wide as we can.

In other, well-attended talks, Tom Leighton and W. Daniel Hillis of MIT described mathematical problems related to the design and application of parallel algorithms for modern, highly parallel computers such as Hillis' own *Connection Machine;* Thomas F. Banchoff from Brown University took the audience on a tour of the fourth dimension with the aid of computer graphics; Clifford A. Pickover of IBM showed how mathematics meets creative art in the field of scientific visualization; Stephen Wolfram, developer of *Mathematica,* and Dana S. Scott of Carnegie Mellon University demonstrated the power of modern computer algebra systems; and Albert Marden from the Geometry Center in Minnesota talked about and showed the fascinating new geometry video, *Not Knot.*

It was clear, from the interest generated among the participants by these and other events, that there is a large audience out there eager to learn what we mathematicians are up to. And we now have the technology to explain a great deal of our activity in terms that many may find accessible.

It is clearly in our long-term interest as a community (and by extension, as a society) to continue to increase our profile among the scientific community at large. With the aid of computer graphics, video, slides, and real-time, interactive computation, mathematicians can put on just as good a "show" as the physical sciences. And with everyone's name badge showing their major field of interest, the more mathematicians that attend, the stronger will be the message that mathematics ranks alongside the other sciences.

The major obstacle is cost. To attend the entire, five-day meeting cost me $900 for conference accommodations and meals alone. With support from both the AMS and MAA, I could do it. It works out considerably cheaper if two people go together and share a room, of course, but even so it is an expensive affair and, coming just a month after the AMS-MAA Joint Annual Meetings, I would imagine relatively few mathematicians are in a position to go.

Even so, having reached the stage where we now clearly rank alongside the traditionally better-funded physical sciences, I hope that enough of us are able to manage it so that we can maintain this momentum. Attending for just part of the meeting is one way to do this and, with next year's AAAS meeting scheduled to be held in Boston, this seems a real option for many of us. Based on my experience this time around, I can guarantee that any who can make it will have a stimulating time, both in terms of mathematics presentations and by finding out what is going on in other areas of science and public policy-making circles.   ■

Keith Devlin, Editor of FOCUS, chairs the Department of Mathematics and Computer Science at Colby College.

Making Everybody Count . . .

Marcia, age four.

When MAA Executive Director Marcia P. Sward received a Citation for Public Service from the American Mathematical Society, FOCUS and its Associate Editor Donald J. Albers recognized a felicitous occasion to interview her. Albers met with Dr. Sward in the MAA's Washington, DC headquarters shortly following the Association's extremely successful 1992 Annual Meeting in Baltimore; together they wandered through her many lives as a mathematical scientist. Their afternoon's conversation, embroidered with a history both personal and characteristic of a woman mathematician in the late twentieth century, appears below.

"I can't let somebody else do this."

ALBERS   At the recent combined 1992 Annual Meeting of the American Mathematical Society [AMS] and the MAA in Baltimore, you received a special award from the AMS—namely the Citation for Public Service—in recognition of your work in establishing the Mathematical Sciences Education Board [MSEB].

The MSEB has grown substantially since you started it in 1985. At the time of its founding you left the MAA to be its first executive director. Tell us a little about how the MSEB was formed.

SWARD   The concept of the MSEB was really first articulated at a meeting of the Conference Board for Mathematical Sciences [CBMS] at Airlie House in Virginia by Joe Crosswhite, who was then the president of the National Council of Teachers of Mathematics [NCTM]. Joe, who is a big man, got up, in a very impressive way, towards the end of the meeting, which had been rather chaotic, and said, "What we need is some kind of national steering committee for mathematics." That was the beginning. CBMS promptly established a committee and I worked with the committee. After the idea was adopted by the CBMS Council, Ken Hoffman and I spent an extremely concentrated six weeks—seven days a week, twelve–fourteen hours a day—writing a proposal to the National Academy of Sciences [NAS] that we hoped would convince them that this was a major new direction for the Academy. In fact, the timing of it was just perfect because Frank Press, the president of the Academy, was very concerned about the fact that the NAS, a major scientific organization, was doing virtually nothing to bring about badly needed changes in mathematics and science education. So they were receptive to the idea. They then advertised the position of executive director. Up until that point I had not thought of myself in that role. But there was a moment of epiphany when I saw the ad in the *Chronicle of Higher Education* and thought, "I can't let somebody else do this."

I worked half-time between the MAA and the MSEB during the fall of 1985. It was an incredibly hectic period; I was trying to round out my activities with the MAA, particularly with FOCUS, which had just expanded. In addition, we organized the first meeting of the MSEB and tried to begin to develop a plan of action. It was an exciting time, but it was also frustrating because I had little help. I was given a temporary secretary and an office in the basement of the Academy building across from the loading dock.

"Lady, you're on your own."

ALBERS   What were the biggest challenges to you during your first years at the MSEB. Did you really think it was going to make it?

SWARD   I woke up many, many a night in a cold sweat because I was afraid that we would not make it and that I would be responsible for having failed to carry out one of the most exciting ideas in mathematics education to come along in years. I felt a very deep sense of personal commitment to it and also a great deal of vulnerability because funding was just not readily available. The Academy had provided some start-up funds, but had then, in effect, said, "Lady, you're on your own." Of course, I wasn't really on my own. Ken Hoffman devoted endless hours to the MSEB, on top of his responsibilities as the "Washington Presence" for the mathematical societies. And Shirley Hill, as the MSEB chair, mentored both Ken and me on the needs and realities of school mathematics.

Funding was certainly the single biggest challenge, and yet, fundamental to getting funding was figuring out what we really wanted to do. We had to determine what made sense in terms of the kinds of leadership activities that the MSEB could undertake as a unit of the National Academies of Sciences and Engineering [NAS and NAE] and what initiatives would have an impact. At that time, the Academy had few lines of communication with the educational establishment. So we had to begin to reach out to such organizations as the Council of Chief State School Officers, the Education *(Interview with Sward continues on opposite page.)*

(Interview with Sward continued from previous page.)
Commission of the States, and others that were concerned about education but had never looked to the Academy for leadership. Most fundamental of all was the challenge of developing an operational philosophy for the MSEB as to how we would relate to mathematical societies. We adopted and, I believe, stuck faithfully to the principle of not undertaking anything that any of the other societies could do better.

Shoot for the stars

ALBERS   Let's turn the clock back to the origin of your involvement with mathematics. Do you remember when it first emerged as a prominent interest?

SWARD   I always liked it. And I always enjoyed whatever we were studying in mathematics, but I did not think of myself as being especially talented in mathematics. I did well in all of my subjects.

ALBERS   Which high school did you attend?

SWARD   Proviso West High School in a western suburb of Chicago.

ALBERS   What did your parents do?

SWARD   Both of them were teachers. My mother taught Spanish and English, and my father taught physics.

ALBERS   Since you were good at everything as an elementary and secondary school student, how did you choose a college?

SWARD   My choice was due to the influence of one of my mathematics teacher, Martha Hildebrandt, who, in the thirties, was the president of the NCTM, a fact I didn't learn until many years later. To me she was just my mathematics teacher. I didn't know she was a national figure. She thought I was good and she told me I should "shoot for the stars" which, to her, meant going to Vassar.

At that time, the late fifties, I think that going to a women's college was, for many young women, more important than it would be today in the sense of developing a self-identity. I remember the first time that it occurred to me that I might have any special ability in mathematics; I always thought the boys were a lot smarter than I was. I was very shy and quiet and didn't speak up much in class. I just wrote good papers. When I took the National Merit Exam, I came out way above everybody else in my school. I kept thinking, "How can this be? All these guys are so much smarter than I am. How could I have outscored them on this exam?"

So I went on to Vassar and, by the end of my freshman year, I had decided to major in mathematics. Earlier, it had been a choice between music and mathematics. I was a pianist and had given several piano concerts when I was younger. By the time I got to Vassar, mathematics was clearly the area in which I felt I had the most interest and the most talent; music was just a hobby. I was also strongly influenced by Winifred Asprey, whose vitality and enthusiasm for mathematics provided a compelling role model for me.

A Man's Subject?

ALBERS   After Vassar, what was graduate school at Illinois like?

SWARD   It was a big shock because, at Vassar, it was perfectly normal to be a physics major or a chemistry major or a mathematics major. I graduated from Vassar summa cum laude and, in that context, I obviously did very well. I went to Illinois and suddenly discovered that mathematics was regarded as a man's subject, and I lost some of my self-confidence.

ALBERS   But hadn't you also thought in high school that mathematics was for males?

SWARD   No, I just thought that the boys were all smarter than I was. Of course, my father had been a physics teacher and my mother, although she taught English and Spanish, made it clear that she had taken calculus when she was in college and that she, too, was good at mathematics. So I had encouragement in mathematics. Education was very highly valued in my home—doing well, being educationally ambitious, and being articulate and grammatical were very important. I remember my grammar being corrected many times. I was expected to be top notch in everything.

ALBERS   So when you went to Vassar and decided to major in mathematics, did you have any idea what you would do with it?

SWARD   I thought I would teach.

ALBERS   At what level? Did you think you would be a high school teacher?

SWARD   That was a possibility. But what I really wanted was to be a college teacher.

ALBERS   So you were already thinking about earning a PhD?

SWARD   Oh yes. I was very modest and shy and not very sure of myself. If you had asked me what I really wanted, I would have said that I wanted to get a PhD. But I had a long way to go to develop the self-confidence that I could do it.

An Outsider in the Department

ALBERS   When you got to Illinois, of course, like any graduate student, you eventually had to choose an area. How did you end up in partial differential equations—which, in the minds of most, is an applied area?

SWARD   Well, it wasn't taught as applied mathematics at Illinois at that time. I think my inclinations really were more strongly directed towards logic, but, unfortunately, my husband was getting a PhD in logic. It was bad enough that we were both graduate students and teaching assistants in the same department. In fact, we had a hard time finding a university that would accept both of us. So logic essentially was out for me even though I loved the field and felt very comfortable with it.

The Peterson Family posing on their sailboat at the Indiana Dunes. (Marcia is sporting the sunglasses.)

ALBERS   What was the most difficult part of being one of six women among hundreds of male graduate students?

SWARD   I felt very much an outsider in the department. It helped that I was married and that my husband Gil was a graduate student too. But the difficulty with that was that people tended to think of me as the secondary partner and that I was there only because Gil was there getting a PhD. I was taken far less seriously as a student than he was.

ALBERS   What did you do in order to be taken seriously—simply do well?

SWARD   I discovered that I could learn a totally new subject area and develop some expertise in a relatively short time; that I could work within a bureaucratic setting fairly effectively, even though it was very frustrating at times. It opened up my conception of myself so that many more things became possible in my mind. So, when I saw an advertisement for the position of Associate Director at the MAA, my first thought was, "They'd never want me." My second thought was, "But I'll never know if I don't apply."

The Placement Test Program [PTP] actually was the way that I became involved with the MAA. When I was at Trinity, PTP was just starting and I was trying to run a placement program for the Trinity students. So I got the MAA materials and used them. An MAA

Marcia with her sons Doug and David Sward.

Jun Rhee congratulates Marcia for earning a blue belt in karate.

SWARD   Well, I was very quiet and I hardly ever spoke up in class, but I wrote good exams. I wasn't aggressive in going out and making myself a part of the network of the department. I did not even have much contact with other graduate students and I rarely talked about problems outside of class, where you really learn what mathematics is all about. I was totally out of all of that.

ALBERS   After getting your doctorate, you spent eleven years teaching at Trinity College in Washington, DC. What prompted you to leave the school?

SWARD   When my two boys were old enough, I began to think about my own career and what I wanted to do. I knew I didn't want to stay at Trinity forever, despite the fact that I loved the school. It was a wonderful place to teach, but I wanted to do more than that. So I obtained a one-year fellowship with the Department of Transportation in highway safety, about which I knew nothing. But I learned a lot. It was a totally different world for me.

Living in a federal bureaucracy has to be about as far removed from teaching in a Catholic women's college as you can get. But I learned a great deal about myself, about my capabilities, and my interests.

"Yes"

ALBERS   What did you learn about yourself?

SWARD   That I could do a lot of things in addition to teaching college mathematics.

ALBERS   Such as?

questionnaire came to me at Trinity and it said, "Would you be interested in possibly working with MAA committees?" I thoughtlessly checked "Yes." It turned out that the committee needed a woman and they needed somebody local because they didn't have any more travel funds. So Al Willcox, who was then the Executive Director, called my department chair and asked, "Is this Marcia Sward any good?" History does not provide the answer to that question. I presume she said yes.

The Fast Lane

ALBERS   What motivated you to think about coming back to the MAA after such exciting years at the MSEB?

SWARD   I'm not sure anybody can live in the fast lane in Washington in that kind of position for a very long period of time. Burn out can come very rapidly. There was a certain glamour to it. I was meeting senators and very high level people and going all around Washington and around the country talking about this exciting new endeavor. But it was also physically, mentally, and emotionally exhausting because it was absolutely nonstop. The pressure was relentless all the time I was there. I felt that, for the longer term, I needed to be in a more stable situation and that I wanted to be involved in carrying out the recommendations that we had been generating through the MSEB. I knew how the MAA operated, and that it would play a key role. So, rather than stay in the think tank mode forever, I was ready to move into implementation.

ALBERS   Can you be more specific about the joys of implementation?

(Interview with Sward continued from previous page.)

SWARD   The MAA has great strengths resident in a large cadre of very loyal members, people who have been involved for many years, as well as in newer people. We have vast abilities to communicate ideas and influence what happens. We don't directly control anything that happens on any campus, but we do have influence. I think through our publications program, meetings, and committee work, the MAA can be far more of a national and international force for undergraduate mathematics than it has been. I think it's very important that we do that. Mathematics and science education have risen in the national consciousness to an incredible level, far beyond anything we would have believed, even a few years ago, and the MAA has many new opportunities for leadership.

SWARD   Certainly the hours, the weekend work, and the travel are hard to reconcile with raising children. Fortunately, during the time when they were little, I was teaching. I had summers off, Christmas and spring breaks, and so forth. There was far more flexibility in my schedule and, by the time I came to the MAA, the kids were old enough that they didn't need so much of my time and energy. In fact, I think that my professional work has been of considerable interest to the kids. They wouldn't always admit it, but they've been interested in what I'm doing and I've tried to draw them in in various ways. For example, David, my younger son, who is at Carnegie Mellon, has reviewed the contract for our new computer system and made suggestions for hardware and software. And Doug's commitment to the environment has inspired my efforts within the MAA.

Marcia relaxing at Lida K. Barrett's Tennessee cabin.

Marcia and Rueben, the world's most affectionate cat.

As Executive Director, one of my main interests and concerns has been SUMMA (Strengthening Underrepresented Minority Mathematics Achievement). I am excited about our new emphasis on bringing students into active membership in the MAA through Student Chapters and national and Sectional meetings. I also have a personal interest in environmental issues. It is critically important that the mathematics community capitalize on and contribute to environmental issues. My son Doug is majoring in human ecology at the College of the Atlantic in Bar Harbor, which specializes in environmental studies. As Doug ungraciously puts it, "Mom, my generation is gonna have to clean up the mess that your generation made." And I hear that.

Being a woman helps ....

ALBERS   Do you think it's been more difficult to lead the MSEB and now the Association because of your gender?

SWARD   No, I think it helps.

ALBERS   Let me qualify. This organization is still made up largely of males and you are obviously not male.

SWARD   Well, you got that right. I feel very blessed that my professional career is occurring during a period when women's professional opportunities have grown enormously and when people have become much more conscious of the fact that women do have a great deal to contribute in professional settings. At the Academy, I was aware of being especially valued because they had no other women executive directors.

ALBERS   For several years you've been remarkably active as an association executive and the mother of two boys. How have you kept so many balls in the air at once?

Rueben, Filters, and Pumps

ALBERS   You love to sing. What kind of music do you like?

SWARD   Well, I'm not a trained singer, but I sang in choirs all of my life until my professional life took me away so much that I couldn't make a consistent commitment to rehearsals and performances.

ALBERS   What are some of your other interests?

SWARD   I am a cat lover and share my home with Rueben, the world's sweetest Persian cat. My other interests center around outdoor activities. I love to go hiking in wilderness areas and experience the natural world—I've been in some incredibly beautiful places like the Grand Canyon, Zion National Park, and the Shenandoah Valley. I find the time very renewing and refreshing, and I long for it when I have spent too much time in an office or in a city. I've also done a fair amount of whitewater rafting, including a fabulous trip on the Salmon River, "The River of No Return!"

ALBERS   What do you see as the biggest challenge facing the MAA over the next decade?

SWARD   The biggest challenge is to help people who are teaching collegiate mathematics to attract and retain a broader spectrum of students. For too long, mathematics has been a filter and not a pump. That's become a stale metaphor but, in fact, it still helps to explain some of what's going on. Mathematics can no longer be essentially only for the elite or an elitist enterprise. It is becoming broader, but at a relatively slow rate. I think we have to speed it up so that we educate the next generation on a much higher level than in the past. Our society is becoming highly dependent upon the intellectual skills of people. We simply can't afford anything less than making everybody count.   ■

Conference on the Teaching of Calculus

The Calculus Consortium, based at Harvard University, will host a summer workshop, in conjunction with the National Science Foundation (NSF) and John Wiley and Sons, on 12 and 13 June 1992. A program of invited speakers, panels, contributed papers and workshops should provide something of interest for everyone involved in changing the way calculus is taught. The scope is broad; there will be no focus on one particular project, approach, or technology. Two- and four-year college, university, and secondary school faculty are all welcome.

A preliminary list of speakers, assembled by conference cochairs Thomas W. Tucker and Spud Bradley, includes Lida K. Barrett, Ronald G. Douglas, Wade Ellis, Jr., James G. Glimm, A. Wayne Roberts, and J. Jerry Uhl, Jr.

Panels are planned on the following topics: *Changing the Climate, Client Disciplines, Nontraditional Classroom Methods, Student Projects, Secondary Schools,* and *Technology.*

Parallel fifteen-minute sessions are available for contributed papers. The title of the paper and a twenty-five-word abstract should be submitted, by **1 April 1992** to: Karen or Joe Thrash, Department of Mathematics, SS Box 5045, University of Southern Mississippi, Hattiesburg, Mississippi 39406-5045; KThrash@USMCP6.Bitnet. Selected candidates will be notified by 30 April 1992.

Attendance will be limited. For additional information and an application, contact: Herman O. Sudholz, Harvard University, Department of Mathematics, Science Center, Room 325, One Oxford Street, Cambridge, Massachusetts 02138; Calculus@math.Harvard.EDU.   ■

Conference on Computers in Geometry Classrooms

This conference, held at St. Olaf College in Northfield, Minnesota, 24 and 25 June 1992, will examine efforts and ideas to realize the vision in the *Curriculum and Evaluation Standards* of the National Council of Teachers of Mathematics (NCTM) in secondary school geometry through the integration of computer tools into the classroom. It will feature reports on both research and implementation projects, addressing issues such as:

■ characteristics of current and emerging geometry microworlds;

■ ways in which geometry microworlds can and should faciliatate recommended changes in both the content and instruction of school geometry;

■ instructional methods which enhance and profit from the use of computer-assisted tools; and

■ teacher preparation and enhancement programs which encourage and empower teachers to begin and sustain appropriate use of computer tools.

Proposals for papers or poster sessions are invited and must be received, as one-page, camera-ready abstracts, by **10 April 1992.** Direct proposal submissions and registration information requests to: Martha L. Wallace, Department of Mathematics, St. Olaf College, 1520 St. Olaf Avenue, Northfield, Minnesota 55057-1098; (507) 646-3113; wallace@stolaf.edu. FAX: (507) 646-3549.   ■

Regional Institute in Dynamical Systems

During the summer of 1992, the Department of Mathematics at Boston University will continue to organize a Regional Institute in Dynamical Systems (RIDS). Funded by the National Science Foundation (NSF) as part of its Regional Geometry Institutes Initiative, RIDS will combine both advanced research and creative educational components. The basic purpose of the Institute will be to gather together researchers, college and secondary teachers, graduate students, and even high school students, to study a wide range of topics in dynamics.

The main part of the Institute consists of a series of week-long conferences on special topics in the geometric theory of dynamical. systems. Each conference will feature a principal speaker or group of speakers who will deliver a series of lectures on their specialities. The lectures will be aimed at graduate students and college instructors. The goal is to bring participants to the forefront of current research in various areas of dynamics. The pace of the lectures will be flexible, allowing participants time to assimilate new knowledge and to contemplate uses of their new tools in their own specialities.

The four conferences scheduled in the summer of 1992 include:

■ **6–10 July 1992** *Strange Attractors and Knots.* Principal lecturers: Philip John Holmes of Cornell University and Robert F. Williams of the University of Texas at Austin.

■ **12–16 July 1992** *Dynamics of Annulus Maps.* Principal lecturers: John M. Franks of Northwestern University and Glen Richard Hall of Boston University.

■ **19–23 July 1992** *Complexity and Computability Over the Reals.* Principal lecturers: Lenore Blum of the International Computer Science Institute (ICSI) and Mills College, Michael Shub of IBM's Thomas J. Watson Laboratory, and Stephen Smale of the University of California at Berkeley.

■ **26–30 July 1992** *Dynamics, Competition, and Neural Networks.* Principal lecturer: Morris W. Hirsch of the University of California at Berkeley.

The Institute will focus on coordination with several ongoing programs that combine dynamics and educational issues. These include the Program in Mathematics for Young Scientists (PROMYS), organized by David Fried and Glenn H. Stevens, in which talented high school students study a variety of advanced mathematical topics; and a teacher enhancement project, which seeks to give high school teachers from the Boston area the mathematical background necessary to introduce the geometric ideas of elementary dynamics into the secondary school curriculum. The principal lecturers will deliver several talks each week to the high school students and teachers. Participants will be offered the opportunity to interact with the other groups on campus, either through informal talks or in the Institute's computer lab. Participants especially interested in working with high school teachers are encouraged to apply for support to attend the conferences. We are particularly interested in finding researchers who will conduct small seminars or offer software demonstrations for the high school teachers and students.

The NSF will offer full or partial support for room, board, and travel expenses for a number of participants. In addition, there is a possibility for a limited number of faculty to receive summer salary stipends. For additional information, contact: Dynamical Systems Institute, Department of Mathematics, Boston University, 111 Cummington Street, Boston, Massachusetts 02215.   ■

And Yet, Even More Summer Activities for the Mathematical Scientist . . .

FOCUS EDITORIAL

How many of today's professional mathematicians had their first inkling that there was more to mathematics than performing tedious long division when they started reading Martin Gardner's columns in *Scientific American?* Or W. W. Sawyer's book, *Prelude to Mathematics?* Or are you one of those for whom Courant and Robbins marked the first step in a love affair that would last an entire lifetime? So much a part of the very fabric of the mathematics most of us grew up with, it is hardly necessary to add the title of this book—the phrases "Courant and Robbins" and *"What is Mathematics?"* are virtually synonymous.

Somehow or other, I lost my own copy along the way. Maybe I lent it to a student in whose eyes I caught a glimpse of the curiousity that drove me to first pick it up and glance through the pages, and then never got it back. Or perhaps it was inadvertently thrown out in one of the many moves that have punctuated my career as a mathematician. At any rate, I no longer have it, though as I cast my eye along the "popular mathematics" shelf in my office, I do see my original copy of *Prelude to Mathematics*—a paperback version published by Pelican Books in 1955, price (in 1964) at three shillings and sixpence. Inside the front cover is a certificate saying I was awarded the book as the mathematics prize in my final year at high school. In fact, it was only part of the prize. The prize was always a book of the winner's own choosing. Breaking with tradition slightly (a not altogether easy feat in England, even in the Swinging Sixties), I asked my headmaster (principal) roughly how much the prize book should cost. On being told the norm was about one pound, I

figured that I could buy five paperbacks at that price, and get five times the amount of reading. My request raised several eyebrows, but was eventually granted, and so on Prize Day, I stepped from the stage clutching a neatly tied bundle of paperbacks instead of the usual single, bound copy. I still have them all, nearly thirty years later.

Courant and Robbins was not among that pile, but I had it all the same, and regret its subsequent loss.

What is Mathematics? celebrates its fiftieth birthday this year, and, to mark the occasion, a tribute was paid to the book at the Seventy-Fifth Annual Meeting in Baltimore, 8–11 January 1992, and I finally got my chance to set eyes on one of its authors, Herbert Robbins.

Of course, there have been a number of other "popularizations" of mathematics since Courant and Robbins wrote their book in 1942, and, lately, quite a stream of them, but *What is Mathematics?* was really the first of its kind and, as such, probably influenced all those that came later. It is not easy to convey to the interested layperson the life and vitality that are part of the mathematics we all know. Indeed, the ability to do so seems to be far rarer than that required to prove first-rate theorems. It is therefore appropriate that FOCUS too should join the chorus of those who wish *What is Mathematics* a very happy fiftieth birthday.   ■

Keith Devlin

The opinions expressed above are those of the FOCUS editor and do not necessarily represent the official views of the MAA.

Ohio Section Short Course on Fractals and Geometry

Robert L. Devaney of Boston University will conduct the 1992 Ohio Section Short Course at Bowling Green State University, 17–19 June 1992. The course, aimed at college mathematics teachers, will first provide an overview of fractals and chaos and then connect these concepts to dynamical systems. It will also include discussions of how instructors might integrate these course topics into areas mathematics majors normally cover in college. Devaney, whose research interests span dynamical systems and complex dynamics, Hamiltonian systems, and computer experiments in mathematics, has written *An Introduction to Chaotic Dynamical Systems* and *Chaos, Fractals, and Dynamics: Computer Experiments in Mathematics* and edited *Chaos and Fractals: The Mathematics Behind the Computer Graphics.*

The course will include afternoon sessions on Wednesday and Thursday and morning sessions on Thursday and Friday, with a concluding session on Friday afternoon. Registration is $90 with a Thursday evening banquet option and participants may secure accommodations in a campus dormitory or at a nearby motel.

For additional registration information, contact: David A. Blaeuer, Department of Mathematics, University of Findlay, 1000 North Main Street, Findlay, Ohio 45840-3695; (419) 424-4705. FAX: (419) 424-4822. For additional information on the short course site, contact: Thomas A. Hern or Clifford A. Long, Bowling Green State University, Bowling Green, Kentucky 46789; (419) 372-2626 or (419) 372-7462.   ■

Computer Algebra Systems Summer Workshops

The following computer algebra system (CAS) workshops are for people seeking assistance in preparing to use a CAS in their teaching, particularly calculus. All participant expenses, other than travel, will be paid for by NSF. For additional information, write to the appropriate contact person named below.

15–19 June 1992 Western Washington University, Bellingham, Washington 98225. Instructors: Wade Ellis, Jr. and Warren Page. CASs: *Derive* and *Maple.* Contact: Jerry L. Johnson, Department of Mathematics, Western Washington University, Bellingham, Washington 98225.

21–26 June 1992 Fort Lewis College, Durango, Colorado 81301. Instructors: Wade Ellis, Jr. and Joseph R. Fiedler. CASs: *Derive* and *Maple.* Contact: Jim Wixon, Department of Mathematics, Fort Lewis College, Durango, Colorado 81301.

12–17 July 1992 Colby College, Waterville, Maine 04901. Instructors: James Douglas Child and Donald B. Small. CASs: *Calculus T/L, Maple, Derive,* and *Mathematica.* Contact: Donald B. Small, Department of Mathematical Sciences, United States Military Academy, West Point, New York 10996.

2–7 August 1992 Clemson University, Clemson, South Carolina 29634. Instructors: John W. Kenelly, Donald R. LaTorre, and Thomas G. Proctor. CASs: *HP 48s Calculator.* Contact: John Kenelly, Department of Mathematical Sciences, 0-112 Martin Hall, Clemson University, Clemson, South Carolina 29634-1907   ■

New From the MAA

Problems For Mathematicians: Young and Old

Paul R. Halmos

This is a book of problems for mathematicians at all levels. Halmos says: "I wrote this book for fun. It was fun indeed—the book almost wrote itself. It consists of some of the many problems that I started saving and treasuring a long time ago. Problems came up in conversations with friends, and in correspondence, and in books and in lectures. I enjoyed them, thought about them, tried to solve them, tried to change them, and tried to think of new ones, and then I tried to organize and write down the ones I was fondest of—and this book is the result."

The problems come complete with their statements, hints, and solutions. The purpose of the statements is to stimulate thought. The reader is asked to think of extensions and improvements of the results asked for. The hints are intended to get the reader to look in a possibly profitable direction.

Some of the problems can be solved by high school students. Others require the maturity of a professional mathematician, who can be a second year graduate student or someone who has been earning a living by thinking about mathematics for a long time. All of them are challenging and fun.

328 pp., 1991, Paperbound
ISBN 0-88385-321-3
List: $24.00   MAA Member: $16.00

Catalog Number DOL-12

Student Research Projects in Calculus

Marcus Cohen, Edward D. Gaughan, Arthur Knoebel, Douglas S. Kurtz, and David Pengelley

Changing the way students learn calculus was the goal of five mathematicians at New Mexico State University. In the Spring of 1988, they began work on a student project approach to calculus.

You can use their methods in teaching your own calculus courses. Over 100 projects are presented, all of them ready to assign to students in single and multivariable calculus. The projects were designed with one goal in mind: to get students to think for themselves. Each project is a multistep, take-home problem allowing students to work both individually and in groups.

Each project has accompanying notes to the instructor, reporting students' experiences. The notes contain information on prerequisites, list the main topics the project explores, and suggest helpful hints. The authors have also provided several introductory chapters to help instructors use projects successfully in their classes and begin to create their own.

232 pp., 1992, Paperbound
ISBN 0-88385-503-8
List: $21.00 MAA Member: $14.00

Catalog Number SRPC

Perspectives on Contemporary Statistics

David C. Hoaglin and David S. Moore, Editors

This book is a must for anyone who teaches statistics, particularly those who teach beginning statistics–mathematicians, social scientists, engineers–as well as for graduate students and others new to the field. The authors focus on topics central to the teaching of statistics to beginners, and they offer expositions that are guided by the current state of statistical research and practice.

Statistical practice has changed radically during the past generation under the impact of ever cheaper and more accessible computing power. Beginning instruction has lagged behind the evolution of the field. Software now enables students to shortcut unpleasant calculations, but this is only the most obvious consequence of changing statistical practice. The content and emphasis of statistics instruction still needs much rethinking.

The book opens with a contemporary overview of statistics as the science of data–a view much broader than the "inference from data" emphasized by much traditional teaching. The next two chapters discuss the philosophy and some of the tools used in data analysis and inference, and its implications for teaching. Other chapters examine the science of survey sampling, essential concepts of statistical design of experimentation, contemporary ideas of probability, and the reasoning of formal inference. The book concludes with introductions to diagnostics and to the alternative approach embodied in resistant and robust procedures.

252 pp., Paperbound, 1991
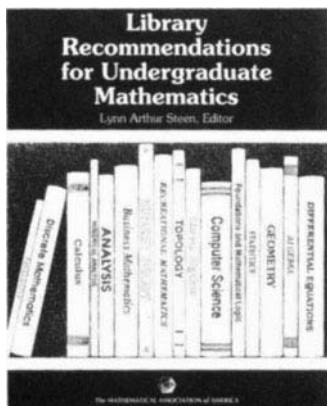ISBN 0-88385-075-3
Price: $20.00
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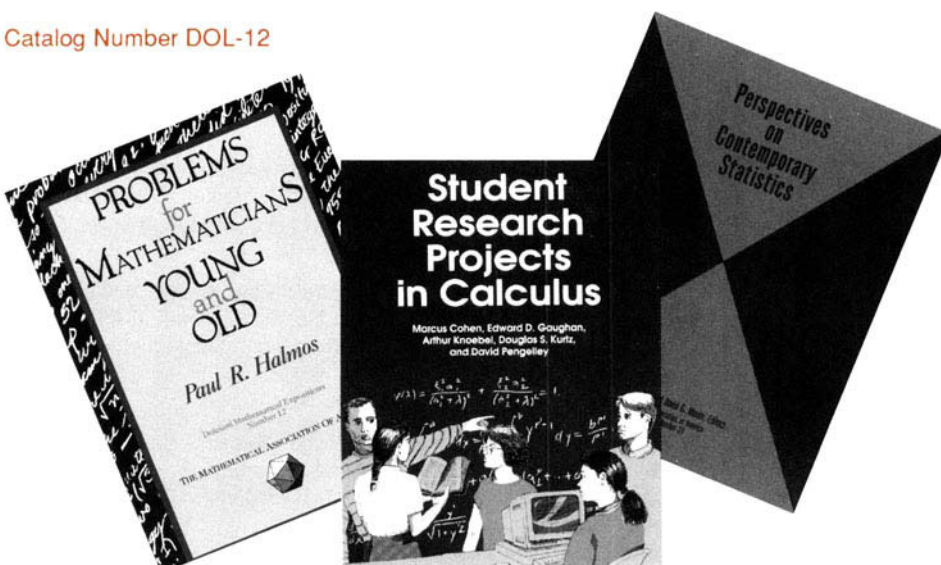
New From the MAA

Library Recommendations   **Library Recommendations**   **Library Recommendations**

Both of these sets of library recommendations provide up-to-date recommendations for titles in the mathematical sciences that should be part of every library collection. Both timely volumes were prepared with the advice of over 100 subject-matter specialists. The suggested titles cover the breadth of the mathematical sciences (including computer science, statistics, and many areas of applied mathematics). Asterisks mark approximately half the titles as specially recommended for libraries with limited budgets. Among the recommended titles some are marked as books of highest priority. Also included are recommended periodicals for undergraduate and two-year college libraries. Although intended for libraries, both volumes are an excellent source of inspiration for self-study by anyone wishing to explore a new field or to catch up on the recent literature in a subject.
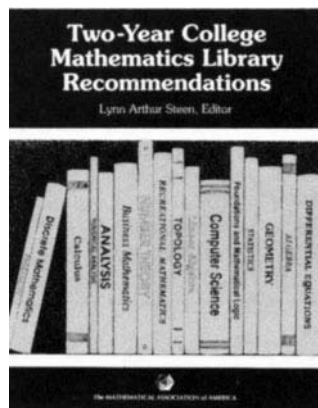
Library Recommendations For Undergraduate Mathematics

Lynn Arthur Steen, Editor

200 pp., 1992, Paperbound
ISBN 0-88385-076-1
Price: $15.00

Catalog Number LRU

Two-Year College Mathematics Library Recommendations

Lynn Arthur Steen, Editor

92 pp., 1992, Paperbound
ISBN 0-88385-077-X
Price: $10.00

Catalog Number TYR

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■ September 1992 issue
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DEPARTMENT OF MATHEMATICS
East Central University, Ada, OK

Tenure-track, assistant professor position beginning August 1992. Duties include a 12 credit hour teaching load per semester teaching undergraduate mathematics, advising undergraduates, and serving on university and departmental committees. Earned doctorate in mathematics, applied mathematics, or statistics is preferred. Research is encouraged but not required. To ensure consideration, candidates should send letter of application, resumé, copies of graduate and undergraduate transcripts, and three (3) letters of reference by **May 1, 1992** to: Mr. Dale Hayden, Office of Personnel, East Central University, Ada, OK 74820. AA/EOE. Applications will be accepted until the position is filled.

AN EQUAL OPPORTUNITY AFFIRMATIVE ACTION, TITLE IX, SECTION 504 EMPLOYER.

MATHEMATICS

One or more tenure-track positions in mathematics, subject to funding approval, for fall 1992. PhD preferred; ABD will be considered. Priority will be given to candidates with research interests compatible with those in the department. Proof of authorization for employment in the US is required. Salary or rank negotiable. Review of applications begins **April 1, 1992**. Positions open until filled. Send a letter of application, a detailed resumé, transcripts, and the names, addresses, and telephone numbers of three references to: Dr. William F. Denny, Chairperson, Mathematics Faculty Search Committee, McNeese State University, PO Box 92340, Lake Charles, IA 70609-2340. MSU is an Affirmative Action, Equal Opportunity Employer.

THE VIRGINIA MILITARY INSTITUTE
Mathematics-Computer Science
Lexington, VA 24450

Tenure-track position beginning August 1992. Applicant should have a strong interest in teaching. Preference will be given to applicant with a PhD in computer science. Applicants with significant progress toward a PhD will be considered. Duties include teaching both computer science and mathematics. Salary and rank commensurate with qualifications.

VMI is state-supported, with 1,300 undergraduates in engineering, liberal arts, and science. It is located in an attractive college town with three colleges within a six mile radius. Faculty wear uniforms but have no other military duties.

Review of applications will begin on **March 1, 1992** and continue until position is filled. Send resumé, three letters of recommendation, and a graduate transcript to: George Piegari, Department of Mathematics and Computer Science, Virginia Military Institute, Lexington, VA 24450.

AA-EEO Employer.

DAKOTA WESLEYAN UNIVERSITY

Dakota Wesleyan University announces a faculty position in mathematics beginning August 1992. Doctorate in mathematics or mathematics education preferred, desire to teach undergraduates required. Teach 12 hours per semester, primarily upper-level, math education majors. Apply: Dr. Lesta Turchen, 1200 West University, Mitchell, South Dakota 57301.

MATHEMATICS EDUCATION

Assistant professor, tenure-track, beginning August 1992. Doctorate in math education, minimum of three years secondary teaching experience, and strong background in mathematics or statistics required. Duties consist of teaching, research, advising, supervision of student teaching, and service. Send vita, graduate transcripts, and 3 letters of reference to: Shawky Shamma, Chair, Search Committee, Department of Mathematics & Statistics, University of West Florida, Pensacola, FL 32514. Screening begins on/before **May 1, 1992**. UWF is an Affirmative Action, Equal Opportunity Employer.

EARLHAM COLLEGE
Richmond, IN 47374

One-year sabbatical replacement position in mathematics, beginning August 1992. Responsibilities include teaching six courses, with some flexibility in scheduling. We are looking for a person with excellent teaching credentials and at least an MS in mathematics, ABD preferred. As a Quaker college committed to affirmative action and equal employment opportunity, Earlham especially encourages applications from women, racial minorities, and Quakers. Review of applications will begin **March 16** and will continue until the position is filled. Send a letter of application, resumé, transcripts, and three letters of reference to: Mic Jackson, Mathematics Department.

CHAIR, MATHEMATICS

Embry-Riddle Aeronautical University invites applications and nominations for the position of Chair, Department of Mathematics at its Daytona Beach campus. Currently twenty-three faculty serve the department with diversified offerings and a planned degree program. The university has a strong emphasis on aviation and aerospace, with outreach programs throughout the world and a total enrollment of about 18,000 students worldwide, 4,500 at Daytona Beach. The chair must have a doctorate in mathematics, an interest in aviation-aerospace, an appreciation of servicing extension programs, and the ability to administer a large, service-oriented department. Embry-Riddle University is primarily a teaching institution, although the faculty are encouraged to pursue research and scholarly activities. Duties will include broad administrative responsibilities, limited teaching, some committee assignments, and budget management responsibilities. The position is available August 17, 1992.

Please submit a letter of application, resumé, and a list of three references to: Dr. William Grams, Human Resources Dept., Code FOC, Embry-Riddle Aeronautical University, 600 South Clyde Morris Blvd., Daytona Beach, Florida 32114-3900. Screening of applicants begins **March 15, 1992**. Women and minority group members are encouraged to apply. EOE.

TAYLOR UNIVERSITY
Mathematics

Tenure-track position. Teaching will include general education courses and specialized math courses. Appropriate earned doctorate preferred, with other training, strengths, and experience alternatively considered (doctorate required in tenure process). Prior experience desirable. Commitment to Taylor University's philosophy of Christian education necessary and must be addressed in initial inquiry. Direct inquiries to: Dr. Richard Stanislaw, VP for Academic Affairs, Taylor University, 500 W. Reade Avenue, Upland, IN 46989-1001.

MATHEMATICS EDUCATOR

Allegheny College seeks an experienced mathematics educator to play a major role in its redesigned certification program in elementary and secondary education that brings a special math and science emphasis to each. The ideal candidate will have a doctoral degree in mathematics education, graduate work in mathematics, elementary or secondary teaching experience, supervisory experience in the schools, and college teaching experience. Duties will include teaching, course development, and administrative responsibilities.

This senior-level position in a program whose redesign is partially funded by NSF is available now. Please send inquiries, along with a current curriculum vitae, to: Provost Andrew T. Ford, Box 18, Allegheny College, Meadville, PA 16335. Allegheny is an Equal Opportunity Employer.

DEPARTMENT OF MATHEMATICS
University of Wisconsin-La Crosse

Tenure-track, assistant-associate professor (contingent on funding) in undergraduate department. Teach 12 hours/semester in wide range of courses. Continuing scholarly activities and university and department service expected. Requires a PhD in mathematics, statistics, or math education. Begins August 1992. Send application letter, resumé, transcripts, and three letters of reference to: Dr. Jack Scheidt, Chair, Mathematics Department, University of Wisconsin-La Crosse, La Crosse, WI 54601. Materials must be *received by* **March 1.** Women and minorities encouraged to apply. Alphabetical list of nominees and applicants, without differentiation, may be released after deadline. AA/EOE.

MOREHEAD STATE UNIVERSITY
DEPARTMENT OF MATHEMATICAL SCIENCES
ASSISTANT PROFESSOR OF MATHEMATICS

Morehead State University invites applications and nominations for a tenure-track position in mathematics education within the Department of Mathematical Sciences at the rank of assistant professor beginning August, 1992. **Responsibilities:** Teach 12 hours per semester (reassigned time for research possible); participate in curriculum development; and engage in service and scholarly productivity. **Qualifications:** Ph.D./Ed.D. degree in Mathematics Education or Ph.D degree in Mathematics required. Master's degree in Mathematics also required. Ph.D./Ed.D. degree in Mathematics Education preferred. Strong commitment to quality teaching. Submit letter of application, resume, three letters of recommendation, and graduate transcripts no later than April 3, 1992, to:

**Office of Personnel Services
Attn: Asst. Prof. Math.
MOREHEAD STATE UNIVERSITY
HM101
Morehead, KY 40351**

MSU is an EOE/AA Employer

1–5 June 1992 *Number Theory and Dynamical Systems, a Regional Research Conference in the Mathematical Sciences of the National Science Foundation (NSF) and the Conference Board on Mathematical Sciences (CBMS),* California State University at Fresno, Fresno, California. Lecturer: Jeffrey C. Lagarias of AT&T Bell Laboratories. For additional information, contact: Conference Organizer Rudolph M. Najar, Department of Mathematics, School of Natural Sciences, California State University at Fresno, 5245 North Becker Avenue, Fresno, California 93740-0108; (209) 2768-2462.

2–6 June 1992 *A Computer on Every Desk: Implications for Mathematics Courses,* Ithaca College, Ithaca, New York 14850. For additional information, contact: Constance McMillan Elson of the Department of Mathematics at Ithaca College; (607) 274-3107; elson@ithaca.edu. (Also see page five of the February 1992 issue of FOCUS.)

7–12 June 1992 *Bringing the Industry View of Software Engineering to the Classroom,* Indiana University-Purdue University, Indianapolis, Indiana. For additional information, contact: Frank H. Young, Department of Computer Science, Rose-Hulman Institute of Technology, 5500 Wabash Avenue, Terre Haute, Indiana 47803; (812) 877-8401; young@cs.Rose-Hulman.edu. (Also see page four of the February 1992 issue of FOCUS.)

8–11 June 1992 *Sixth Conference on Discrete Mathematics of the Society for Industrial and Applied Mathematics (SIAM),* University of British Columbia, Vancouver, Canada. Organizer: Pavol Hell of Simon Fraser University. For additional information, contact the SIAM Conference Coordinator at the address provided under **11–13 May 1992.**

8–12 June 1992 *Algorithmic Number Theory, an Undergraduate Faculty Enhancement Workshop of the National Science Foundation (NSF),* California State University at Fresno, Fresno, California. Lecturer: Eric Bach of the University of Wisconsin at Madison. For additional information, contact Workshop Organizer Rudolph M. Najar at the address provided under **1–5 June 1992.**

9–11 June 1992 *International Conference on Art and Mathematics (all media),* State University of New York (SUNY) at Albany, Albany, New York. For additional information, contact: Nathaniel A. Friedman, Department of Mathematics, SUNY at Albany, Albany, New York 12222; (518) 442-4621; (518) 456-4390; am92@.bst.albany.edu.

12 and 13 June 1992 *The Teaching of Calculus,* Harvard University, Cambridge, Massachusetts 02138. For additional information, see page fourteen of this issue of FOCUS.)

15–19 June 1992 *Northeastern Section Short Course* on "Exploratory Data Analysis," University of Maine, Orono, Maine. Rickey A. Kolb of the US Military Academy will overview methods of study of a data set. For additional information, contact: Clayton W. Dodge, De-

partment of Mathematics, University of Maine, Orono, Maine 04469; (207) 581-3908.

15–19 June 1992 *Computer Algebra System Workshop,* Western Washington University, Bellingham, Washington 98225. For additional information, see page fifteen of this issue of FOCUS.

15–20 June 1992 *Workshop on Computer Experiments in Differential Equations,* Harvey Mudd College, Claremont, California 91711-5990. For additional information, contact: Robert L. Borrelli, Department of Mathematics at Harvey Mudd College; (714) 621-8023; Borrelli@HMCVAX.BITNET. (Also see page five of the February 1992 issue of FOCUS.)

17–19 June 1992 *Ohio Section Short Course on Fractals and Geometry,* Bowling Green State University, Bowling Green, Kentucky 43402-1524. For additional information, see page fifteen of this issue of FOCUS.

20–24 July 1992 *Fortieth Anniversary Meeting of the Society for Industrial and Applied Mathematics, (SIAM)* Century Plaza Hotel, Los Angeles, California. Organizer: James M. Hyman of Los Alamos National Laboratory. On **19 July 1992,** immediately before the meeting, Stephen F. McCormick of the University of Colorado at Denver will conduct a *Tutorial on Multilevel Adaptive Methods for Partial Differential Equations.* For additional information, contact the SIAM Conference Coordinator at the address provided under **11–13 May 1992.**

(Warning continued from page seven.)
In fact, Oldfellow concluded that, without preventive measures, the virus, intended only to generate mischief, will provoke widespread headaches. If you suspect that the virus has infected your system, we can offer only this tip on recognizing and controlling it:

APRIL FOOL'S FROM FOCUS!

Calendar

National MAA Meetings

17–23 August 1992   Seventh International Congress on Mathematical Education (ICME-7), Université Laval, Québec, Canada. For additional information, see "Other Meetings" on this page. Immediately before ICME-7 opens, the MAA Board of Governors will meet in Québec, on Saturday, 15 August 1992.
13–16 January 1993   Seventy-Sixth Annual Meeting, San Antonio, Texas (Board of Governors, 12 January 1993)
15–19 August 1993   Sixty-Eighth Summer Meeting, Vancouver, British Columbia (Board of Governors, 14 August 1993)
12–15 January 1994   Seventy-Seventh Annual Meeting, Cincinnati, Ohio (Board of Governors, 11 January 1994)
25–28 January 1995   Seventy-Eighth Annual Meeting, Denver, Colorado (Board of Governors, 24 January 1995)
10–13 January 1996   Seventy-Ninth Annual Meeting, Orlando, Florida (Board of Governors, 9 January 1996)

Sectional MAA Meetings

Allegheny Mountain   Slippery Rock University, Slippery Rock, Pennsylvania: 11 April 1992
Eastern Pennsylvania and Delaware   Messiah College, Grantham, Pennsylvania: 11 April 1992; Muhlenberg College, Allentown, Pennsylvania: November 1992
Illinois   North Central College, Naperville, Illinois: 24 and 25 April 1992
Indiana   University of Indianapolis, Indianapolis, Indiana: 11 April 1992
Intermountain   Weber State University, Ogden, Utah: 10 and 11 April 1992
Iowa   Graceland College, Lamoni, Iowa: 24 and 25 April 1992
Maryland-District of Columbia-Virginia   University of Virginia, Charlottesville, Virginia: 24 and 25 April 1992
Metropolitan New York   Webb Institute of Naval Architecture, Glen Cove, New York: 3 May 1992
Michigan   Saginaw Valley State University, University Center, Michigan: 8 and 9 May 1992
Missouri   Northwest Missouri State University, Maryville, Missouri: 10 and 11 April 1992
Nebraska   Hastings College, Hastings, Nebraska: 10 and 11 April 1992
Northcentral   Gustavus Adolphus College, Saint Peter, Minnesota: 24 and 25 April 1992
Northeastern   Merrimack College, North Andover, Massachusetts: 5 and 6 June 1992; Trinity College, Hartford, Connecticut: 20 and 21 November 1992; University of Massachusetts-Dartmouth, North Dartmouth, Massachusetts: 11 and 12 June 1993; Westfield State College, Westfield, Massachusetts: 5 and 6 November 1993
Oklahoma and Arkansas   Henderson State University, Arkadelphia, Arkansas: 3 and 4 April 1992
Pacific Northwest   University of Montana, Missoula, Montana: 18–20 June 1992

Rocky Mountain   Colorado College, Colorado Springs, Colorado: 10 and 11 April 1992
Seaway   Queen's University, Kingston, Ontario, Canada: 1 and 2 May 1992; Cornell University, Ithaca, New York: 6 and 7 November 1992
Southeastern   Kennesaw College, Marietta, Georgia: 10 and 11 April 1992
Southern California   University of Southern California, Los Angeles, California: November 1992
Southwestern   University of Arizona, Tucson, Arizona: Spring 1992
Texas   University of Houston-Downtown, Houston, Texas: 9–11 April 1992
Wisconsin   University of Wisconsin at Whitewater, Whitewater, Wisconsin: 24 and 25 April 1992

Other Meetings

7 April 1992   *Third Annual Dolciani Lectures,* Hunter College of the City University of New York (CUNY). Persi Diaconis of Harvard University will deliver a lecture on "The Geometry of Randomness" and Jean J. Pedersen of Santa Clara University will discuss "Geometry—The Gateway to Understanding." For additional information, contact: Joseph Roitberg, Department of Mathematics and Statistics, Hunter College (CUNY), 695 Park Avenue, New York, New York 10021; (212) 772-5300 or 4357.
11–13 May 1992   *Fourth Conference on Optimization of the Society for Industrial and Applied Mathematics (SIAM),* Hyatt Regency Hotel, Chicago, Illinois. Organizers: Jorge J. Moré of Argonne National Laboratory and Jorge Bicedal of Northwestern University. On **10 May 1992**, immediately before the conference, Moré and Stephen J. Wright, also of Argonne National Laboratory, will conduct a *Tutorial on Numerical Optimization and Software.* For additional information, contact: SIAM Conference Coordinator, 3600 University City Science Center, Philadelphia, Pennsylvania 19104-2688; (215) 382-9800; meetings@siam.org. FAX: (215) 386-7999.
15–17 May 1992   *Twenty-First Annual State of Jefferson Mathematics Congress,* Whiskeytown, California. Speakers at this campground conference include Jeffrey B. Haag of Humboldt State University on "Biodegradable Matrices" and Lisa M. Yates of Southern Oregon State College on "Convergence of Chebyshev Series." For additional information, contact: Conference Organizer Richard G. Montgomery, Department of Mathematics, Southern Oregon State College,1250 Siskiyou Boulevard, Ashland, Oregon 97520-5026; (503) 552-6141. FAX: (503) 552-6429.
29–31 May 1992   *Computing in the Calculus,* Rensselaer Polytechnic Institute, Troy, New York. For additional information, contact: Anderson Center for Innovation in Undergraduate Education, 121 Communications Center, Rensselaer Polytechnic Institute, Troy, New York 12180-3590; (518) 276-4853; JWILSON@RPITSMTS. FAX: (518) 276-4852. (Also see page four of the February 1992 issue of FOCUS.)