

FOCUS

THE NEWSLETTER OF THE MATHEMATICAL ASSOCIATION OF AMERICA

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MARCH-APRIL 1983

The MAA and the Winds of Change

Ivan Niven

Professor Ivan Niven of the University of Oregon became the 40th President of the Mathematical Association of America last January at the 66th Annual Meeting in Denver, Colorado. Professor Niven will serve a two-year term as President.

"These times, like all times, are good times if only we know what to do with them." . . . Emerson.



As I assume the presidency of the MAA for '83 and '84 it is natural to contemplate recent developments in mathematical activity in the United States and Canada, and the role the Association may reasonably be expected to play in these developments.

Education in science and mathematics is in a rather shaky state, at some levels in the USA at least, according to all reports. Declining achievement scores, increasing enrollments in remedial courses, and the severe and growing shortage of qualified teachers have been noted in story after story in the newspapers and magazines. Many prominent members of the Association have participated in the recently developing dialog on education in mathematics and science. Although the objective of our organization is "to assist in promoting the interests of the mathematical sciences in America, especially in the *collegiate* field," it has long been recognized that we cannot fulfill this purpose without cooperating in the improvement of instruction in mathematics at the *secondary* and *lower* levels of education. This should be a high priority of the MAA.

In a recent report of the Conference Board of the Mathematical Sciences, it is pointed out that "the widespread availability of calculators and computers and the increasing reliance of our economy on information processing and transfer are significantly changing the ways in which mathematics is used in our society." The MAA has successfully introduced computer mini-courses into both the national and some of the sectional meetings. We should continue our efforts to keep the membership informed about the current situation in computers in mathematics, especially the use of

computers in the classroom. This is a serious challenge to our publication program.

Another current trend in the curriculum is the role of discrete mathematics, as contrasted with continuous mathematics, especially in the first two years of college. Although calculus has traditionally been the centerpiece of mathematical study in the freshman-sophomore years, increasing attention has been given to a possible alternative program incorporating finite mathematics. The dialog on this topic has reached the formative stage, with some recommendations already proposed, but the dust has not yet settled. Faced with the challenge of computer science for the hearts and minds of beginning college students, we must work to increase the number of mathematics majors by all possible means, including the reexamination of our programs.

Inasmuch as the attendance at the two national meetings is exceeded in any given year by the total attendance at all the sectional meetings, these regional gatherings are clearly of great importance. I want to work for continued cooperation between the national organization and the sections. A good example of this liaison is the recent action by the Board of Governors providing for national recognition of Association members who have done outstanding work for their sections, by granting them the Certificate for Meritorious
(continued on page 2)

Poster Inside: Be a MATH TEACHER!

There is a full-sized poster in the center of this issue of *FOCUS* encouraging students to consider careers as mathematics teachers. You can help alleviate the critical shortage of high school mathematics teachers by posting the poster in classrooms, offices, dormitories—where ever students who are looking for a career with

OPPORTUNITY . . . CHALLENGE . . . SATISFACTION
will see it.

Additional copies of the poster may be obtained without charge from: POSTER, Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036.

MAA (continued from page 1)

Service. The selection of the members to be so honored, it should be noted, is in the hands of the officers of the sections.

We should continue the campaign to get more young mathematicians into the MAA, participating in the programs and contributing to the deliberations. I urge our younger members to involve themselves in the work of the Association, thereby shaping the organization to meet the challenges of the future. From a recent study made on behalf of the Board of Governors we know why MAA members belong to the organization. Central among the reasons, it turns out, are the "opportunity to explore new and old mathematical ideas in the journals," the "bond with the professional community," and "keeping up with the latest developments in collegiate mathematics." The programs of the MAA should be relevant to the needs of the members, especially the younger members, on whom our future depends.

We must maintain the finances of the organization on an even keel in these tough times. This task has been made easier in recent years by the outstanding work of the staff in Washington, D.C. in computerizing all records and systems, and by the foresight of our leadership a few years ago in purchasing our headquarters building, through the generosity of many of our members. In this connection it is very encouraging that the membership has been very supportive of the recently inaugurated *Greater MAA Fund*.

The Association should continue its cooperation with other organizations dedicated to the advancement and promotion of mathematics and its teaching. We have, of course, collaborated with the American Mathematical Society (AMS) and the Society for Industrial and Applied Mathematics (SIAM) on comprehensive membership lists and combined meetings, for example. The preparation of guidance materials jointly with the National Council of Teachers of Mathematics (NCTM) is another illustration of the kind of cooperation to be fostered.

The above discussion has focused primarily on the changing times. Not to be overlooked, however, is the great strength of our ongoing programs in such areas as publications, contests, and committee deliberations. These regular activities need our steady and faithful support.

Contributed Papers for Albany Meeting Due May 15

Papers are being accepted on four topics in collegiate mathematics for presentation in contributed paper sessions at the MAA Summer Meeting in Albany, New York. The topics are:

- The undergraduate mathematics curriculum
- Special concerns: Remediation, Articulation, and Math Anxiety
- The use of computers in undergraduate mathematics instruction
- Classroom notes.

Presentations will normally be ten minutes, although selected contributors may be given up to twenty minutes.

Individuals wishing to submit papers for any of the sessions at the Albany meeting should send the following information to the MAA's Washington Office (Mathematical Asso-

ciation of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036) before May 15, 1983:

1. Title
2. Intended Session
3. A one-paragraph abstract (for distribution at the meeting)
4. A one-page outline of the presentation
5. A list of special equipment required for the presentation (eg., computer, movie projector, videotape player).

This information will be sent to session leaders who will arrange for refereeing. Selection of papers will be announced by July 1, 1983.

MAA Distinguished Service Award to Beckenbach

The 1983 MAA Award for Distinguished Service to Mathematics was given to Edwin Ford Beckenbach on January 8, 1983 at the Annual MAA Business Meeting in Denver, Colorado. The award was accepted by his widow Alice C. Beckenbach. Professor Beckenbach died suddenly of a stroke last September at age 76.

Although Professor Beckenbach served the MAA and the greater mathematical community in many ways, his most notable contributions were in the area of mathematical publications. He served as the Chairman of the MAA Committee on Publications from 1971 until his death. More books were published while he chaired the Publications Committee than in the whole previous history of the MAA. He was a prime mover and successful advocate for the creation of an MAA newsletter—this *FOCUS*. He initiated the *Dolciani Mathematical Expositions* series, the *Brink Selected Papers* series and the forthcoming *MAA Notes* series. He helped to bring the *Two-Year College Mathematics Journal (TYCMJ)* under MAA auspices, to make *Mathematics Magazine* and *TYCMJ* official journals of the MAA, and to establish the Allendoerfer and Pólya Awards for writing in these two journals.

The text of the presentation of the Distinguished Service Award, which is reprinted in the February issue of the *American Mathematical Monthly* and the January issue of the *TYCMJ*, gives a fuller summary of Professor Beckenbach's contributions to the mathematical community.

PROFESSIONAL OPPORTUNITIES IN THE MATHEMATICAL SCIENCES

Eleventh Edition - 1983 (completely revised)
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Guest Editorial

We Are All Teachers of Mathematics

Peter Hilton

Many years ago, a colleague of mine, an algebraic topologist, formulated what he called the Principle of the Invariance of Student Response to Curriculum Change. We try to make our college courses more appropriate, more relevant, more accessible, more intelligible to the students, yet the distribution of their grades remains remarkably unaffected by our efforts. Despite our disappointments, most of us go on trying. Some of us, however, surveying our relative lack of success, comfort ourselves with the reflection that the damage was done before the students ever reached college, so we are scarcely to blame. Implicit in this attitude is the assumption that college mathematics teachers do not have any responsibility for precollege mathematics instruction. This was never a justifiable position and it is especially reprehensible today.

Mathematics is a unity, along each of its axes. It is a unity with respect to each of its parts, as modern research is attesting, and it is also a unity in time. It develops—or, rather, should develop—continuously from kindergarten through graduate school. This continuity is often given practical expression through the adoption of the spiral approach to the curriculum. It follows that if we want students to derive benefit from their university courses, it is essential that these be properly articulated with their secondary experience of mathematics. Advanced placement programs are helpful in this respect, but they are plainly not enough to achieve the stated objective. Furthermore, we who may claim to be close to the cutting edge of mathematics have the responsibility, surely, of ensuring that curriculum changes at the college level designed to take account of the changing role and nature of mathematics are explained to and coordinated with those who are preparing students to embark on that curriculum.

How can we effectively participate in the precollege educational process? First, we should develop contacts with high school teachers through common professional activities—we should join NCTM, and encourage more teachers to join MAA. We should study the textbooks used in high schools and, through our contacts, make effective, cogent and constructive criticisms. It should not be too visionary to contemplate a system of faculty exchange to increase the sense of common purpose and to enrich our understanding of the problem.

However, perhaps the most obviously effective step we could take would be to encourage our own students, even the best of them, to become high school teachers. Surely we all believe that we are privileged to be given the responsibility and the opportunity to educate the young and, believing this, we should have no difficulty in conveying a similar feeling to our students. Moreover, this is a particularly exciting time to become a mathematics teacher, since mathematics plays a key role in modern society, and it is vital that tomorrow's adults be able to understand and practice quantitative thinking.

Unfortunately, though, we are up against a very real problem. For the material rewards of teaching are so paltry compared with what a talented student could earn in industry

that it is not easy, in all conscience, to justify the exercise of strong influence on a student to choose a teaching career. At least, it is our duty to point out the financial disadvantages to be set against the undoubted benefits of such a career.

However, we surely have the right to encourage those students whose idealism already inclines them to a teaching career. It is a regrettable fact—and one which seems not to be generally known—that there are many vacancies today in the ranks of high school teachers of science and mathematics, so there should be no problem for such admirable young people to find employment. Our encouragement of them should, moreover, commit us to continued involvement with them; for example, we should promise them the opportunity of continued university contact through summer programs and similar arrangements.

It would be splendid if we could do more—if we could, through our professional organizations, bring such pressure to bear on the appropriate authorities that teachers, at all levels, receive a reward and a respect in our society more commensurate with their qualifications and responsibilities. This should be our ultimate goal—but let not the great difficulty of attaining it deter us from what we can do here and now for the teaching of mathematics.



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Chairman of the MAA Newsletter Editorial Committee:
Ronald M. Davis, Northern Virginia Community College.

Readers are invited to submit articles, announcements, or Letters to the Editor for possible publication in *FOCUS*. All materials should be sent to the Editor at the MAA Headquarters in Washington, D.C.

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from the Executive Director's desk . . .

The crisis in precollege science and mathematics education is suddenly big news. It is no surprise, of course, to MAA members, who have seen it coming for a decade. But when our concerns suddenly burst onto page one of the newspaper on the nation's breakfast table we are more than surprised. It takes our breath away.

Even President Reagan seems to have gotten the message, judging from his emphasis, in his January 25 State of the Union Message, on this crisis and on his determination to find solutions. Mr. Reagan has finally realized that our nation's world leadership in industry and technology is at stake. Loss of this leadership could threaten our security as a nation.

A symptom as well as a part of the cause of the crisis is the critical shortage of qualified mathematics and science teachers in our nation's high schools. In a decade there has been a 77% decline in production of mathematics teachers by our 600 teacher training institutions. And only 55% of the graduates prepared to teach mathematics actually enter the profession. Twenty new mathematics teachers graduated in the state of Texas in 1982—in the *whole state*—and only seven of them went into teaching.

In Maryland, my state, it is estimated that 50,000 secondary school students are being taught mathematics by more than 400 teachers who are not certified to teach mathematics. Shocking! And the news is the same from all four corners of the nation. If you want to learn more about the shortage, write to NCTM, 1906 Association Drive, Reston, VA 22091. (Enclose a stamped, self-addressed return envelope.) Ask for their Fact Sheet on the Mathematics Teacher Shortage. It will curl your hair.

Fortunately, the nation reads its morning newspaper, and there are signs of awakening and determination to put our house in order. I have mentioned the President's speech. He showed that he was serious by including \$50 million in his FY 84 budget for training of otherwise unqualified persons to teach mathematics or science. Even before receiving the President's budget, members of the 98th Congress had introduced three bills designed to spur national, state, and local initiatives to improve mathematics and science education. These are essentially bills that died in the last Congress, but they are popping up much earlier this time and are being taken more seriously.

By the time you read this issue of *FOCUS* the NSF may have announced two Presidential Initiatives designed to improve the knowledge and skills of mathematics and science teachers by (a) Presidential recognition of outstanding teachers and (b) a network of teacher workshops and training sessions funded jointly by NSF and local agencies. An important feature of the second initiative is its emphasis on participation of research scientists in the effort.

As this issue goes to press the NSF initiatives appear to be in some trouble on Capitol Hill. It will be unfortunate if jurisdictional squabbles between Congress and the Execu-

tive Branch stall these efforts to improve our teacher corps. I can only hope that if NSF is allowed to move on this, MAA members will accept the challenge to become involved. If the NSF program is tabled, I am confident that another teacher training initiative will come along soon, possibly through the Department of Education.

MAA members are already positioned well to help in this effort. Those of us who teach in colleges and universities are in a unique position to help increase the number of qualified students entering teacher training programs. This issue of *FOCUS* contains an attractive poster directed to mathematics students. Post it! Chances are, your students still think it is difficult to find employment as a mathematics teacher. Talk to your students about the satisfactions of a teaching career. Point out the incentives, financial and others, that are being created in most states for students and young teachers in mathematics and science. The NCTM fact sheet has many specific examples.

If you are not a teacher you certainly are a citizen of a state and a municipality. Urge your representatives to push for greater efforts in your school district to attract and reward good mathematics teachers and to offer training to all who need it.

Peter Hilton's guest editorial in this issue contains many excellent suggestions. Read it—read it before you read this column if you can. Then act. The climate has never been more favorable for improvements in mathematics education. The need has never been greater.

A. B. Willcox

The *TYCMJ* in Transition

Warren Page

Professor Warren Page of New York City Technical College was elected by the MAA Board of Governors at its Denver meeting to serve a five-year term as the Editor of the Two-Year College Mathematics Journal. His term as Editor starts in January 1984.

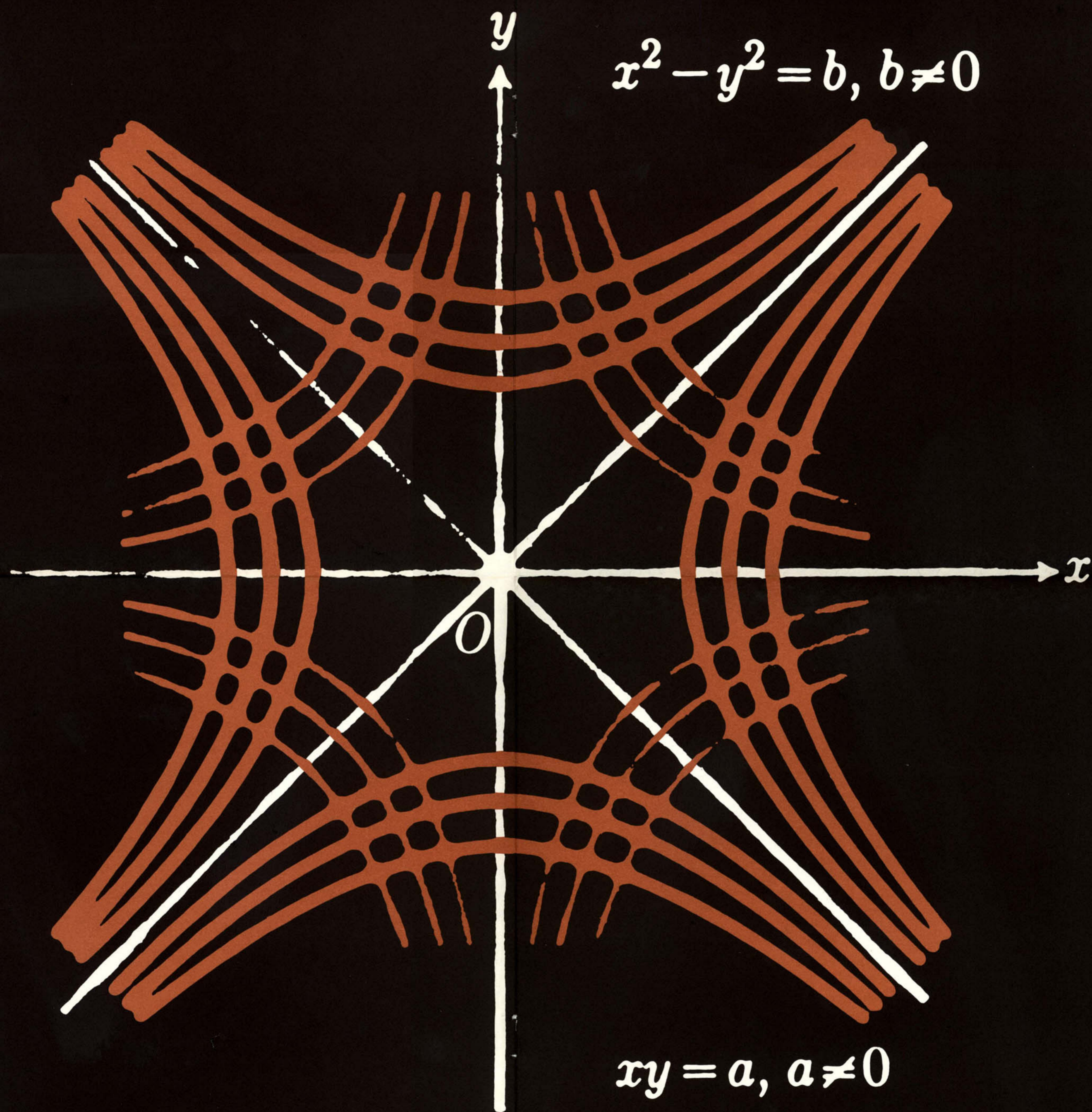
My wife, Janice, and I have one little Page. The *TYCMJ* and I have *many* pages—400 a year, to be precise. Right now, trying to tell you how I'll make the most of 2000 journal pages over the next five years seems somewhat ironic—I'm not even sure how to make the most of the page allotted to me for this *FOCUS* article.



Don Albers' superb editorship and the many fine innovations already introduced into the Journal will be an almost impossible act to follow. The challenge will surely be a worthy test of our new editorial board's mettle. As Editor-elect, I need your opinions and I need them now. Keep in mind that we are playing a zero-sum game: more pages allotted to some features mean commensurately fewer pages for others. What aspects of the *TYCMJ* do you like and dislike? Should some features occur more often? Other less often? Any bold, imaginative ideas? New columns? Suggested articles and filler materials?

Outlined below are some of my ideas which, I hope, will further enhance the *TYCMJ*'s growth and development.

Looking for a career with
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Be a MATH TEACHER!

There is a critical nationwide shortage of high school math teachers. Go to your math department today and find out more about this exciting career.

International Perspectives. It has always been my belief that interaction with mathematics educators abroad would further enrich our *TYCMJ*, as well as facilitate international dialogues on matters of importance to undergraduate mathematics. Accordingly, I plan to appoint several overseas Associate Editors who will promote the Journal, solicit articles, and encourage participation from their colleagues abroad. My aim is to select one person from each of the following areas: Australia/New Zealand, India/Asia, Canada, England, West Germany, Latin America, and the Soviet Union/Eastern Europe. *Needed: Mathematically capable, highly regarded, energetic nominees from these regions.*

Interviews, Profiles, and ?. The publication of interviews and profiles is one of the most popular features of the *TYCMJ*. Thus, I plan to continue them. In fact, I'd like to broaden the concept to encompass other types of dialogue and insightful exchanges: panel discussions, debates on controversial issues, an interview with an American International Mathematical Olympiad team, etc. *Wanted: Suggestions for these and other types of forums you'd like to see in the TYCMJ.*

Classroom Capsules. I like *Classroom Capsules*—so many quality tidbits from diverse areas of mathematics can be blended into an 8-10 page spread. A column of this nature provides an especially rich medium for the exchange of ideas and perspectives among colleagues. It is my hope that *Classroom Capsules* will continue to grow in size and scope. *Thus, I invite (and challenge) colleagues everywhere to create short, crisp, quality articles for publication in Classroom Capsules.*

New Computer Column. The *TYCMJ* is the only MAA journal to introduce a section devoted to computer-related mathematics. Now it's time to build on this if we are to continue to meet our reader's needs. The overwhelming majority of our *TYCMJ* readers are involved with the teaching of mathematics at the level where computers can be most effective. Thus, the January 1984 issue of the *TYCMJ* will introduce an expanded version of what has already been initiated.

The new computer column will have three components: articles, a section *Bits 'n Bytes*, and software reviews. I hope that each column will contain a general-interest mathematics-using computers articles, and a mathematics article of classroom-related computer vintage. Since this is a new column, there is no backlog of articles. *This is a call for computer-related mathematics articles.* (Note the emphasis on the word *mathematics!*) *Bits 'n Bytes* will consist of one paragraph abstracts covering journal articles and other media-related items of computer interest. To round out each column, there will be one or two fully detailed reviews of software which are specifically geared to the teaching and learning of undergraduate mathematics.

New Media Highlights Column. In today's information age, the need for an ongoing literature survey which will help readers keep aware of (and track down) articles of interest is greater than ever, and it can no longer be confined just to journal articles.

The *TYCMJ*'s new *Media Highlights* column is designed to help readers monitor a broad spectrum of publications, professional activities, and instructional resources. This column will contain: (a) concisely written abstracts calling attention to general-interest articles in a wide variety of sources (more than 200 publications regionally, nationally, and

abroad); (b) synopses of proceedings from national and international conferences; (c) miscellaneous coverage (guides, surveys, handbooks, projects, films, and other instructional resources) of undergraduate-level mathematics interests; (d) book and courseware reviews. Media summaries from readers, as well as suggested items for review, are welcome.

Where do we go from here? Will the *TYCMJ* change dramatically? Perhaps, in some respects, but not in guiding principles. The Journal will hold fast to its philosophical mission, serving the needs of all who are interested in the teaching of two-year college level mathematics. The *TYCMJ* will continue to aim at strengthening the links between teachers of mathematics at all levels.

With your help, support, and goodwill, *The Two-Year College Mathematics Journal* will continue to serve as a lively, creative, and meaningful means of communication. I hope you will become involved with this exciting endeavor.

People in the News

Three mathematical scientists have been named among the twenty creative individuals receiving five-year grants from the prestigious MacArthur Foundation. The mathematical scientists and their grants are:

- **Bradley Efron**, Professor of Statistics at Stanford University, \$220,000
- **Charles Peskin**, Professor of Mathematics at New York University, \$180,000
- **Julia Robinson**, Professor of Mathematics at the University of California, Berkeley, \$295,000.

The individuals selected as MacArthur Fellows do not apply for the awards but are nominated secretly by a committee chosen by the Foundation. The nominated must show exceptional talent, originality, self-direction, and promise for the future. The awards have absolutely no strings attached. The recipients can use the money freely for their own projects. There is no requirement of reporting, publishing, or conforming to any specific type of research program.

Editorial Manager

The Mathematical Association of America has an opening for an Editorial Manager (EM) at its headquarters in Washington, D.C. beginning July 1, 1983 or as soon as possible thereafter. The EM will supervise an editorial department responsible for copy editing and layout for three journals and several books per year. In addition to supervising 2-3 editorial assistants, the EM will be expected to participate in the editorial process and work closely with journal editors and authors. Qualifications for this position include mathematical training to the master's degree level or beyond, demonstrated writing skills, and professional experience, or its equivalent, in editing mathematical manuscripts. Salary will be commensurate with the experience and training of the candidate.

Applicants should send a curriculum vitae and should arrange to have three letters of recommendation sent to:

Dr. Marcia P. Sward, Associate Director
Mathematical Association of America
1529 Eighteenth Street, N.W.
Washington, D.C. 20036

The Mathematical Association of America is an equal opportunity employer.

MAA Sections Offer Summer Short Courses

Maryland-DC-Virginia

The Maryland-DC-Virginia Section will offer two Summer Workshops at Salisbury State College, Salisbury, Maryland:

"Microcomputer Graphics," June 13-17, 1983
G. J. Porter, University of Pennsylvania

Topics for this workshop include an overview of machine capability, homogeneous coordinates and their use in computer graphics, two-dimensional representatives of three-dimensional objects, curve-fitting, and computer graphics in the classroom.

"Linear Algebra and the Microcomputer," June 20-24, 1983
Gareth Williams, Stetson University, Florida

Topics will include the language BASIC, Markov-chain models, models involving graph theory, the vector space R^n and general inner-product spaces, geometry and relativity, eigenvalues and eigenvectors, and applications in the classroom.

The cost, including room and board, is \$185 for each five-day workshop. For more information, contact Dr. B. A. Fusaro, Department of Mathematical Sciences, Salisbury State College, Salisbury, MD 21801 (301-543-6465).

North Central

"Modern Computer Science for Mathematicians" will be the topic of a short course to be offered by the North Central Section of the MAA June 13-17 at the University of Minnesota in Duluth. The program is intended for those with some computer programming background who are interested in modern concepts of software development. It should be useful for educators developing computer science curricula.

Three minicourses will be given, covering the following topics: Programming in Pascal, Introductory Data Structures, and The Design of Large Programs. Introductory lectures on other computer languages such as LISP and symbolic algebra packages like REDUCE that are of special inter-

est to mathematicians are also planned.

Registration for the short course will be \$100 per participant which includes computer access and all lectures during the week. Accommodations are available on campus for a very reasonable price.

More information about the program and accommodations may be obtained from Professor Max L. Benson, Department of Mathematical Sciences, University of Minnesota-Duluth, Duluth, Minnesota 55812 (218-726-8254).

Northeast

The Northeast Section will hold its Fifth Annual Short Course on June 13-17, 1983, at the University of Maine, Orono, Maine. The course, entitled "Computational Complexity," will be conducted by Professor Herbert Wilf of the University of Pennsylvania. Topics will include: rates of growth of familiar functions and the execution times of familiar computations, examples from linear algebra, the speed of combinatorial computations, exponential versus polynomial time, NP-completeness and public key encryption, progress in the bin-packing problem, and the chromatic number. Reading lists, problems, and computer problems will be distributed and discussed.

The cost of the Short Course is \$175, which includes course fee, room, and board. For more information, contact Professor Grattan Murphy, Department of Mathematics, University of Maine at Orono, Orono, Maine 04469 or Professor Donald Small, Department of Mathematics, Colby College, Waterville, Maine 04901.

Ohio

"Data Structures," Denison University, June 13-July 1, 1983. (See *FOCUS*, November-December 1982). Application deadline: March 25, 1983.

"An Introduction to Factoring and Primality Testing," Kent State University, June 16-18, 1983. (See *FOCUS*, January-February 1983.)

New from the MAA Studies in Mathematics . . .

Studies in Computer Science

edited by Seymour Pollack
Volume #22, MAA Studies in Mathematics

408 pp. Cloth List: \$29.00 MAA Member: \$22.00

Written by computer scientists for mathematicians, the book presents a readable and balanced discussion of the role of mathematics in computer science and the contribution of computing to mathematics.

Topics included are: *The Development of Computer Science; Programming Languages and Systems, Specifying Formal Languages; Formal Analysis of Computer Programs; Computational Complexity; Computer Science and Artificial Intelligence; The Impact of Computers on Numerical Analysis; Computer Simulation; and Computational Tools for Statistical Data Analysis.*

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Pacific Northwest

In conjunction with its annual meeting June 16-18, 1983, at the University of Idaho in Moscow, Idaho, the Pacific Northwest Section will offer a short course "Computer Graphics in Mathematics Instruction." The course instructor will be David Moursand of the University of Oregon Department of Computer and Information Science.

The course is intended for novices who wish to enhance their instruction of lower division level collegiate mathemat-

ics. There will be approximately eight class hours, divided into three sessions. Topics will include: what is computer graphics?; overview of hardware, software, general theory, and current practices; applications to the mathematics curriculum at the precalculus and calculus levels; implications for students and faculty, and for course content at the precalculus levels.

The course registration fee is \$10. For more information, write to: Professor Ralph Neuhaus, Department of Mathematics, University of Idaho, Moscow, ID 83843.

Over Six Hundred Members Help Build a "Greater MAA"

Six hundred and eighty MAA members expressed their support for the activities and purposes of the MAA by making gifts of money to the Association in 1982. Their gifts have swelled the newly-created *Greater MAA Fund* to more than \$21,000 and the total of all contributions to the Association in 1982 to an impressive \$46,274.

Grand Benefactors Marvin Bittinger, Malcolm Brachman, William Chinn, Earl Swokowski

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Calendar

National MAA Meetings

63rd Summer Meeting, SUNY at Albany, New York, August 8-10, 1983
67th Annual Meeting, Louisville, Kentucky, January 27-29, 1984

68th Annual Meeting, Anaheim, California, January 11-13, 1985
70th Annual Meeting, San Antonio, Texas, January 23-25, 1987

Sectional MAA Meetings

Eastern Pennsylvania and Delaware Millersville State College, Millersville, Pennsylvania, April 9, 1983.
Florida Florida State University, Tallahassee, Florida, March 4-5, 1983.
Illinois Rockford College, Rockford, Illinois, April 29-30, 1983.
Indiana Indiana University, Bloomington, Indiana, April 16, 1983.
Intermountain University of Utah, Salt Lake City, Utah, April 29-30, 1983.
Iowa Iowa State University, Ames, Iowa, April 22-23, 1983.
Kansas University of Kansas, Lawrence, Kansas, April 8-9, 1983.
Kentucky Bellarmine College, Louisville, Kentucky, April 8-9, 1983.
Maryland-DC-Virginia Thomas Nelson Community College, Hampton, Virginia, April 16, 1983.
Metropolitan New York St. John's University, Jamaica, New York, May 7, 1983.
Michigan Oakland Community College, Auburn Heights, Michigan, May 6-7, 1983.
Missouri Missouri Western State College, St. Joseph, Missouri, April 22-23, 1983.
Nebraska University of Nebraska, Omaha, Nebraska, March 25-26, 1983.
New Jersey Glassboro State College, Glassboro, New Jersey, April 23, 1983.

North Central Carleton College, Northfield, Minnesota, April 22-23, 1983.
Northeastern Bowdoin College, Brunswick, Maine, June 17-18, 1983.
Ohio Marietta College, Marietta, Ohio, April 22-23, 1983.
Oklahoma-Arkansas University of Oklahoma, Norman, Oklahoma, March 18-19, 1983.
Pacific Northwest University of Idaho, Moscow, Idaho, June 16-18, 1983.
Rocky Mountain Colorado State University, Ft. Collins, Colorado, April 29-30, 1983.
Seaway, joint meeting with the New York State Mathematics Association of Two-Year Colleges, Sheraton Inn and Conference Center, Utica, New York, April 22-23, 1983.
Southeastern The Citadel, Charleston, South Carolina, April 15-16, 1983.
Southern California University of California-San Diego, La Jolla, California, March 5, 1983.
Southwestern New Mexico Institute of Mining and Technology, Socorro, New Mexico, March 25-26, 1983.
Texas North Texas State University, Denton, Texas, April 8-9, 1983.
Wisconsin University of Wisconsin, West Bend, Wisconsin, April 15-16, 1983.

Other Meetings

APRIL 1983

13-16. **National Council of Teachers of Mathematics Annual Meeting**, Detroit, Michigan. Contact: NCTM, 1906 Association Drive, Reston, VA 22091.
15-16. **Conference on Undergraduate Mathematics**, Oklahoma State University. Invited speakers: George Piranian, C. H. Edwards, Jr., Lynn O. Wilson, Reuben Hersh. Contributed papers from undergraduate students are welcome. Contact: J. R. Choike, Department of Mathematics, Oklahoma State University, Stillwater, OK 74078.
21-22. **Fourteenth Annual Pittsburgh Conference on Modeling and Simulation**, Pittsburgh, PA. Contact: William G. Vogt or Marling Mickle, Modeling and Simulation Conference, 348 Benedum Engineering Hall, University of Pittsburgh, Pittsburgh, PA 15261.
25-27. **The Institute of Management Science/Operations Research Society of America Joint Meeting**, Chicago, Illinois. Contact: ORSA, 428 East Preston Street, Baltimore, MD 21202.

MAY 1983

17-19. **Conference on Large Scale Scientific Computation**, University of Wisconsin-Madison. Contact: Mrs. Gladys Moran, Conference Secretary, Mathematics Research Center, University of Wisconsin, 610 Walnut Street, Madison, WI 53705.
26-31. **American Association for the Advancement of Science National Meeting**, Detroit, Michigan. "Science and Engineering—Toward a National Renaissance." Contact: AAAS Meetings Office, 1101 Vermont Avenue, N.W., Washington, D.C. 20005.

JUNE 1983

6-8. **National Educational Computing Conference (NECC 83)**, Baltimore, Maryland. Host: Towson State University. Contact: Doris K. Lidtke, General Chairman, NECC 83, Department of Mathematics and Computer Science, Towson State University, Baltimore, MD 21204.
13-17. **MAA Maryland-DC-Virginia Section Summer Workshop—Microcomputer Graphics**, Salisbury State College, Salisbury Maryland. (See "MAA Sections Offer Summer Short Courses" on page 6 of this issue.)

13-17. **MAA North Central Section Short Course—Modern Computer Science for Mathematicians**, University of Minnesota—Duluth. (See "MAA Sections Offer Summer Short Courses" on page 6 of this issue.)
13-17. **MAA Northeast Section Short Course—Computational Complexity**, University of Maine—Orono. (See "MAA Sections Offer Summer Short Courses" on page 6 of this issue.)
13-July 1. **MAA Ohio Section Short Course—Data Structures**, Denison University, Granville, Ohio. (See *FOCUS*, November-December 1982.)
16-18. **MAA Ohio Section Short Course—An Introduction to Factoring and Primality Testing**, Kent State University, Kent, Ohio. (See *FOCUS*, January-February 1983.)
16-18. **MAA Pacific Northwest Section Short Course—Computer Graphics in Mathematics Instruction**, University of Idaho, Moscow, Idaho. (See "MAA Sections Offer Summer Short Courses" on page 6 of this issue.)
20-24. **MAA Maryland-DC-Virginia Section Summer Workshop—Linear Algebra and the Microcomputer**, Salisbury State College, Salisbury, Maryland. (See "MAA Sections Offer Summer Short Courses" on page 6 of this issue.)

JULY 1983

25-August 2. **History of Mathematics Summer Seminar for Teachers of Mathematics**, University of Toronto. Participants will explore ways in which the history of mathematics can enrich both the undergraduate and upper-level secondary mathematics curriculum. Contact: History of Mathematics Summer Seminar, Institute for the History and Philosophy of Science and Technology, University of Toronto, Toronto, Canada M5S 1K7. (416-978-7391).

AUGUST 1983

8-12. **American Mathematical Society Summer Meeting**, Albany, New York. Contact: AMS, P.O. Box 6248, Providence, RI 02940.
8-12. **Meeting of the Association for Women in Mathematics**, Albany, New York. Contact: AWM, Women's Research Center, Wellesley College, 828 Washington Street, Wellesley, MA 02181.

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