

FOCUS

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NSB Commission Proposes Plan to Make U.S. Precollege Math and Science Education Finest in World by 1995

After 17 months of study and deliberation, the National Science Board Commission on Precollege Education in Mathematics, Science, and Technology has released its final report. In it, the Commission proposes a plan for making U.S. precollege education in mathematics, science, and technology the world's finest by 1995. The recommendations of the Commission include:

- Retraining and upgrading of the 1.16 million elementary and secondary school teachers who presently are less than fully qualified to teach these subjects.
- Rigorous standards for certifying mathematics and science teachers, together with improved training, recognition, and compensation.
- Establishment of 1000 elementary and 1000 secondary exemplary schools and programs throughout the nation to serve as "landmarks of excellence."

- Formulation of a set of "new basics" to establish a new standard of scientific and technological literacy and a more coherent pattern of K-12 mathematics and science education.
- Substantially increased time devoted to these academic subjects, through increases in the school day, week, or year, as well as through increased discipline in the classrooms.
- Increased time for mathematics and science: 60 minutes per day for mathematics, 30 minutes per day for science; a full year of mathematics and science in grades 7 and 8.
- Increased use of computers and other modern educational technologies for student instruction, teacher training, and classroom management.
- Increased requirements for high school graduation: 3 years of high school mathematics, including 1 year of algebra and 3 years of science and technology, including one semester of computer science.
- Increased requirements for college admission: 4 years of high school science, including physics, chemistry and 1 year of computer science, and 4 years of mathematics, including a second year of algebra and coursework covering probability and statistics.

(continued on page 2)

Meeting Program Inside

The center section of this issue contains the program for the Sixty-Seventh Annual Meeting of the Mathematical Association of America which will be held in the Commonwealth Convention Center and the Hyatt Regency Louisville from Thursday, January 26 through Saturday, January 28, 1984. The meeting will be held in conjunction with the meetings of the American Mathematical Society and the Association for Women in Mathematics.

Housing and preregistration forms were mailed to all MAA members in October. The preregistration deadline is December 5, 1983.



An aerial view of Louisville, Kentucky, site of the MAA Annual Meeting in January.

NSB Commission (continued from page 1)

To accomplish all of this, the Commission calls for increased funding at the national, state, and local levels, including a Federal investment of \$1.51 billion over five years in recognition of the strong national interest and Federal role in rejuvenating mathematics and science education. In its report, the Commission declines to estimate increased State and local costs but does reaffirm the "national consensus" that States and localities should shoulder most of the responsibility and cost of public education.

The Commission recommends appointment by the President of a National Education Council to oversee the Commission's plan and to measure progress towards its goals, Governor's Councils in each State to stimulate change and develop state educational goals and monitor progress, and a Council on Educational Financing, to determine costs of educational improvements and methods to raise the needed funds.

In the "Executive Summary" of the report, the Commission states:

The Nation that dramatically and boldly led the world into the age of technology is failing to provide its own children with the intellectual tools needed for the 21st century.

We continue to lead because our best students are still unsurpassed. We continue to lead because our universities, industries, resources, and affluence attract the finest talent from throughout the world. But this is a precarious advantage. The world is changing fast. Technological know-how is spreading throughout the world—along with the knowledge that such skills and sophistication are the basic capital of tomorrow's society.

Already the quality of our manufactured products, the viability of our trade, our leadership in research and development, and our standards of living are strongly challenged. Our children could be stragglers in a world of technology. We must not let this happen; America must not become an industrial dinosaur. We must not provide our children a 1960's education for a 21st century world.

The National Science Board accepted the Commission's report at its meeting on September 15-17 and released a Resolution of Acceptance stating:

... The Board strongly endorses the Commission's view that the rebuilding of American educational superiority in mathematics, science, and technology is essential to the country and must be achieved through the efforts of state and local governments and local communities, stimulated and assisted by federal leadership that makes educational goals a national priority and provides support for new approaches to mathematics, science, and technology education. . . . This report will provide the framework for action for years to come. . . . The Board considers the report an excellent context in which to plan the National Science Foundation's programs in precollege mathematics, science, and technology education for all levels and students. The Board has initiated a broad reexamination of how NSF education programs can best meet the objectives of the Commission's report.

The report is being widely disseminated throughout the country, including copies to all the 16,500 school districts. Individual copies of the report and a volume of source materials may be obtained by writing to: NSB Commission on Precollege Education in Mathematics, Science, and Technology, 1800 G Street, N.W., Washington, D.C. 20550.

MAA members Katherine P. Layton of Beverly Hills High School and Frederick Mosteller of Harvard University served on the Commission along with 18 other people from a wide variety of fields. The Commission was co-chaired by Cecily Cannan Selby, former Dean of Academic Affairs and Chair of the Board of Advisors of the North Carolina School of Science and Mathematics, and William T. Coleman, Jr., former U.S. Secretary of Transportation.

NSF Science Education Directorate Reestablished

National Science Foundation Director Edward A. Knapp has reestablished a science and engineering education directorate at the Foundation. The original directorate was replaced a year ago by the Office of Scientific and Engineering Personnel and Education (OSEPE) when the Reagan administration drastically cut back science education funding.

Knapp's move comes at a time of nationwide demand for improved science education. At the forefront of those calling for improvements is the NSF's own NSB Commission on Precollege Education in Mathematics, Science, and Technology. (See "NSB Commission Proposes Plan to Make U.S. Precollege Math and Science Education Finest in World by 1995" on page 1 of this issue.)

Knapp has appointed Laura Bautz, previously in the Astronomy Division, as Acting Assistant Director and Walter Gillespie, Office Director of OSEPE, as Deputy Assistant Director. The number of staff positions has been increased from 26 to 45. The internal structure of the directorate is currently being worked out and should be completed by November 15.



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Ronald M. Davis, Northern Virginia Community College.

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Mordell Conjecture Proved

James R. C. Leitzel

New insight into the famous conjecture known as Fermat's Last Theorem has recently been provided by Gerd Faltings of Wuppertal University in West Germany. In a paper entitled "Einige Sätze zum Thema Abelsche Varietäten über Zahlkörpern," Faltings succeeds in establishing the validity of the Mordell Conjecture which, while it does not completely settle Fermat's Last Theorem, does show that the number of positive integer solutions to $x^n + y^n = z^n$ is a finite set.

Because of the connection with Fermat's Last Theorem, *The New York Times*, *Science*, and *Newsweek* each carried articles last summer announcing the result. In response to reporters' questions, Michael Artin of the Massachusetts Institute of Technology described the result as being "close to the theorem of the century—at least in the field of number theory." Spencer Bloch of the University of Chicago commented that it answers questions which were previously thought to be unanswerable.

During the summer meetings of the AMS and MAA held in Albany, New York, over 350 mathematicians attended a hastily scheduled special presentation on Faltings' paper given by John Tate of Harvard University.

The Mordell Conjecture, formulated in 1922 by the British mathematician L. J. Mordell, asserts that if a given curve defined over the field of rational numbers has genus greater than or equal to two, then the set of points with rational coordinates lying on the curve is a finite set. Briefly, this means we have a polynomial relation in two variables with coefficients from the field of rational numbers that describes the curve. The genus roughly measures the number of holes in the curve.

Faltings, in his paper, establishes the conjecture by building on the results of several others working in the field of algebraic geometry. The proof is indirect and makes extensive use of results from algebraic geometry. Through a key insight, Faltings saw how to put previous results together in a new way to achieve his striking proof. The techniques used are expected to have application in other areas and thereby may open up a whole range of problems to new solutions.

The relationship with Fermat's Last Theorem follows from the fact that any solution in integers x, y, z (not all zero) to the relation $x^n + y^n = z^n$ gives rise to a rational point on the curve defined by $u^n + v^n = 1$, and conversely.

The result is new and exciting to the mathematical community. This fall, many universities have scheduled special seminar courses to discuss the proof. Clearly, the full implications of the result or the applications of Faltings' techniques are not yet known. However, a few comments can be made. As mentioned earlier, Faltings' proof is indirect and consequently non-constructive. It would be of value to achieve a constructive method to predict the size of the finite set of solutions. Can the proof be extended to apply to any field which is finitely generated over the field of rational numbers? These, and other questions will interest mathematicians over the next several months.

As we meet our students and discuss the status of some of the "famous unsolved problems," we have now an exciting example of the dynamic, lively, and continually developing world of mathematics.

Anderson to Speak on "The Mystique of R. L. Moore" in Louisville

Although it is debatable whether or not there are reliable yardsticks by which one can measure the quality of teachers, there is compelling evidence that certain individuals must, without question, be regarded as exemplary. R. L. Moore is such an individual. In his Retiring Presidential Address at the MAA Annual Meeting in Louisville, Richard D. Anderson will give tribute to the intellectual and pedagogical legacy of R. L. Moore. Professor Anderson's talk, "The Mystique of R. L. Moore," is scheduled for Saturday, January 28, 9:00 a.m.-9:50 a.m.

The "Moore method" of teaching, in which the student must decide whether a given mathematical statement is a theorem and, if so, must not only prove it but discover and prove new theorems in the process, is well-known. Aspects of the Moore legacy which are perhaps less well-known are the magnitude of Moore's "mathematical family," ranging from Moore's original 50 Ph.D. students to an estimated 1000 mathematicians in the 2nd to 6th generations, and the leadership roles in which many of Moore's students have served with distinction. By way of example, Richard D. Anderson, who received his doctorate under Moore in 1948, is only one of five Moore students to have served in the MAA Presidency.

In his Retiring Presidential Address, Professor Anderson promises to share his insights into Moore's secrets of success—what it was that made him such an extraordinarily successful teacher and how he instilled in his students the desire to serve the wider mathematical community.

In thematic conjunction with Professor Anderson's talk, the film *Challenge in the Classroom* will be shown from 8:00 a.m.-8:55 a.m. on Saturday, January 28, immediately preceding the Retiring Presidential Address. The film features R. L. Moore discussing his ideas about how to teach mathematics and demonstrating his classroom techniques.

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Highlights of the Board of Governors' Albany Meeting

New MAA Secretary

Dr. Kenneth A. Ross, Professor of Mathematics at the University of Oregon, was elected Secretary of the Association by the Board for a term starting in January 1984. See "Ross Elected MAA Secretary" on page 6 of this issue.

Hedrick Lecturer

The Board unanimously elected N. J. A. Sloane of Bell Telephone Laboratories as the Hedrick Lecturer for the 1984 Summer Meetings at the University of Oregon.

Certificate for Meritorious Service

The Certificate for Meritorious Service will be offered for the first time at the 1984 Summer Meetings. This award can be given for service at the national or sectional level of the Association. The following sections will nominate recipients for the 1984 awards: Indiana, Louisiana-Mississippi, Nebraska, Ohio, and Southeastern.

New Junior High School Contest

The Board approved a proposal from the Committee on High School Contests to establish a new junior high school contest. The new contest will be named the American Junior High School Mathematics Examination (AJHSME) and will become an integral part of the existing contest sequence consisting of the American High School Mathematics Examination, American Invitational Mathematics Examination, and the USA Mathematical Olympiad. A subcommittee of the Committee on High School Contests will assume responsibility for the new contest. An article describing the contest in more detail will appear in a forthcoming issue of *FOCUS*.

Joint Meetings Committee Report

The Board approved the following schedule of meetings:

Louisville, Kentucky	January 26-28, 1984
Eugene, Oregon	August 16-19, 1984
Anaheim, California	January 11-13, 1985
New Orleans, Louisiana	January 9-11, 1986
San Antonio, Texas	January 23-25, 1987.

The Secretary emphasized the need for summer meeting sites. Universities wishing to host these meetings should send invitations to Kenneth A. Ross, University of Oregon.

Transfer of Editorial Office

The MAA Editorial Office will be transferred from Buffalo, New York, to MAA Headquarters in Washington, D.C. effective in January 1984.

College Credit for High School Math?

In response to a request from the floor there was a discussion of the problem of granting college graduation credit for mathematics courses distinctly at a high school level. Several governors reported that their institutions had moved to deny baccalaureate credit for such courses directly or indirectly as a result of the statement approved in 1979 by the Board of Governors and the NCTM Board of Directors.

This statement was distributed by the MAA in 1980 to chairmen of departments in the mathematical sciences. Hoping to encourage other institutions to follow their favorable trend, the Board asked the Executive Director to reprint the 1979 statement and send it again to department chairmen.

The Association is interested in learning whether other institutions have similarly restricted the awarding of graduation credit for such courses. Readers are urged to send case histories to Dr. Alfred B. Willcox, Executive Director, MAA, 1529 Eighteenth Street, N.W., Washington, D.C. 20036. Please indicate the extent to which the MAA statement influenced these changes.—Editor.

Ohio Section to Offer Summer Course on Systems Programming

The Ohio Section is planning a short course for college faculty on June 11-June 29, 1984, at Denison University on systems programming. The central topic of the course will be program translation. Experience in assembly language (*any* assembly language will do) programming will be presupposed and issues related to the design and implementation of assemblers will be considered. The course will also deal with some of the problems associated with the translation of programs written in higher-level languages to assembly or machine language programs. Writing an assembler for a hypothetical computer will be an integral part of the course.

The instructor for the course will be Zaven A. Karian of Denison University. Professor Karian taught the highly-successful short course on data structures sponsored by the Ohio Section last summer.

A grant from the GTE Corporation will cover all expenses related to instruction and use of facilities. The cost of room and board is \$475. For additional information and/or application forms, write to: Dr. Zaven A. Karian, Mathematical Sciences Department, Denison University, Granville, Ohio 43023 (614-587-6563).

Report from the Joint ACM/MAA Committee

Retraining in Computer Science at the Clarkson Institute

The Joint ACM/MAA Committee for Retraining in Computer Science met in Potsdam, New York, in July to plan its second year of activity and to observe the Clarkson Institute for Retraining in Computer Science in its first summer in operation.

The Clarkson Institute for Retraining in Computer Science was founded under the auspices of the Committee and is under the direction of Professor Ed Dubinsky. It follows the two-summer retraining model recommended by the Airlie Conference of 1982. Approximately forty college mathematics professors formed the first class this summer and will return next year for a second eight-week session. Each participant will complete a substantial computing project during the intervening academic year at his/her home institution.

The curriculum at the Institute emphasizes modern methods of structured programming and top-down design plus a strong exposure to the fundamental concepts in computer science. Course syllabi take full advantage of the mathematics background of the participants.

67th ANNUAL MEETING

Mathematical
Association of
America



The Sixty-Seventh Annual Meeting of the Mathematical Association of America will be held from Thursday, January 26 through Saturday, January 28, 1984, in Louisville, Kentucky. The meeting will be held in conjunction with meetings of the American Mathematical Society and the Association for Women in Mathematics.

MAA sessions will take place in the Commonwealth Convention Center and the Hyatt Regency Louisville.

Retiring Presidential Address

Richard D. Anderson, Louisiana State University, Baton Rouge, will deliver his Retiring Presidential Address on *Reflections on the mystique of R. L. Moore* at 9:00 a.m. on Saturday, January 28.

Invited Addresses

There will be seven invited fifty-minute addresses. The list of speakers, their affiliations, the dates and times of their talks, and their titles follow:

Beta and gamma functions from Euler to Selberg and beyond, Richard A. Askey, University of Wisconsin, 10:00 a.m., Saturday; *Turning good mathematics into good TV*, Donald Berman and Ross L. Finney both of COMAP, noon, Saturday; *Nonexpansive maps*, Andrew M. Gleason, Harvard University, 11:00 a.m. Saturday; *The computer as a grader*, Melvin Maron, University of Louisville, 9:00 a.m., Friday; *Mathematics in industry—How do problems arise?*, Henry O. Pollak, Central Staff Organization for the Regional Bell Operating Companies, 10:00 a.m., Friday; *Some examples of combinatorial averaging*, Herbert S. Wilf, University of Pennsylvania, 9:00 a.m., Friday; *Computational geometry: Paradigms and applications*, Frances Yao, Xerox Corporation, 11:00 a.m., Friday.

National Meeting of Department Chairmen

The Joint Concerns Committee for Mathematics of the American Mathematical Society, Mathematical Association of America, and Society for Industrial and Applied Mathematics is sponsoring a *National Meeting of Department Chairmen* on Thursday, January 26, from 7:00 p.m. to 10:00 p.m. This meeting is intended to be a step toward discussion of issues relating to the revitalization of mathematics and mathematics departments. Likely discussion topics are the recruiting of mathematicians, the development of a data base for mathematics departments, the report of the Committee on Resources for the Mathematical Sciences, the relationship between mathematics and computer science, and the need for an agenda for future meetings of chairmen. The Organizing Committee members are: David Ballew, Felix Browder, Paul Davis, Bernard Madison (Chairman), Robert O'Malley, and William Trotter.

Minicourses

The MAA will sponsor eight minicourses: (1) *Linear programming*; (2) *Discrete algorithmic mathematics*; (3) *Teaching problem solving*; (4) *Applications of discrete mathematics*; (5) *Problems from industry*; (6) *Applications of computer graphics*; (7) *CONDUIT microcomputer software*; (8) *NonCONDUIT microcomputer software*. See page iii of this program for complete information on these minicourses.

MAA Film

A film featuring the late R. L. Moore, *Challenge in the Classroom*, will be shown at 8:00 a.m.-8:55 a.m. on Saturday, January 28.

Louisville Meeting preregistration and housing forms were mailed to all MAA members in October. Preregistration deadline: December 5, 1983.

Other MAA Sessions

There will be a Panel Discussion at 11:00 a.m. on Friday, January 27. The moderator will be Joan Leitzel of Ohio State University. The topic is *Issues in remediation*.

The Committee on Corporate Members will hold a session at 10:00 a.m. on Saturday, January 28. The moderator will be Jerry Lyons of Prindle, Weber and Schmidt. The topic is *Mathematics publishing, copyright, and software*. Some speakers will be Carol Rischer and Robert Sickles.

There will be a Panel Discussion at 11:00 a.m. on Saturday, January 28. The moderator will be Martha Siegel of Towson State University. The topic is *Beginning integration: Calculus and discrete mathematics in the first two years*.

The Committee on Retraining for Computer Science will hold a Panel Discussion at 3:30 p.m. on Saturday, January 28. The moderator will be Donald L. Kreider of Dartmouth College. The topic is *Progress report on the Clarkson Institute for Retraining in Computer Science Conducted Under the Auspices of the Joint ACM/MAA Committee*.

Business Meeting

The Business Meeting of the MAA will take place at noon on Friday, January 27, at which the 1984 Award for Distinguished Service, the Chauvenet Prize, and the Lester R. Ford Awards for expository writing will be presented.

Board of Governors

The MAA Board of Governors will meet at 9:00 a.m. on Thursday, January 26.

Section Officers

There will be a Section Officers' meeting at 4:00 p.m. on Friday, January 27.

Registration at the Meetings

Meeting preregistration and registration fees only partially cover expenses of holding meetings. All mathematicians who wish to attend sessions are expected to register, and should be prepared to show their meeting badge, if so requested. The fees for Joint Meetings registration at the meeting (listed below) are 30 percent more than the preregistration fees.

Joint Mathematics Meetings

Member of AMS, MAA	\$61
Emeritus Member of AMS, MAA	\$15
Nonmember	\$93
Student/Unemployed	\$15

Employment Register

Employer	\$75
Applicant	No charge

AMS Short Course

Student/Unemployed	\$10
All Other Participants	\$30
One-day Fee (Second Day Only)	\$15

MAA Minicourses #1 through #8

All Participants	\$20 each
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Registration fees may be paid at the meetings in cash, by personal or travelers' check, or by Visa or MasterCard credit card. Canadian checks must be marked for payment in U.S. funds.

There is no extra charge for members of the families of registered participants, except that all professional mathematicians who wish to attend sessions must register independently.

All **full-time** students currently working toward a degree or diploma qualify for the student registration fees, regardless of income.

Nonmembers who register at the meetings and pay the \$93 nonmember registration fee are entitled to a discount of the difference between the member registration fee of \$61 and the nonmember registration fee of \$93 as a \$32 credit against dues in either the AMS or MAA or both, provided they apply for membership before February 29, 1984.

Nonmember students who register at the meetings and pay the \$15 registration fee are entitled to a discount of the difference between the student preregistration fee of \$12 and the registration fee of \$15 as a \$3 credit against dues in either the AMS or MAA or both, provided they apply for membership before February 29, 1984.

Nonmembers and nonmember students who thus qualify may apply for membership at the meetings, or by mail afterward up to the deadline.

Dates and Times

AMS Short Course

Prefunction Room, Regency Ballroom South
Hyatt Regency Louisville

Monday, January 23	11:00 a.m. to 4:00 p.m.
Tuesday, January 24	8:00 a.m. to 2:00 p.m.

Joint Mathematics Meetings

[and MAA Minicourses (until filled)]

Main Lobby, Commonwealth Convention Center

Tuesday, January 24	4:00 p.m. to 8:00 p.m.
Wednesday, January 25	8:00 a.m. to 5:00 p.m.
Thursday, January 26,	
through	8:00 a.m. to 4:00 p.m.
Saturday, January 28	

Registration Desk Services

AMS/MAA Information

Information on the publications and activities of both organizations may be obtained at this section of the registration desk.

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Minicourses

The MAA is planning eight minicourses, as follows:

Minicourse #1: *Linear programming*, organized by Charles E. Haff of the University of Waterloo, will be given from 2:00 p.m. to 4:00 p.m. on Thursday, January 26 and Friday, January 27. Linear programming is the study of maximizing or minimizing linear functions subject to linear constraints. In addition to its theoretical richness, linear programming has wide applicability to such real-world problems as capital budgeting, design of diets, resource management, games of strategy, economic growth prediction and transportation management.

The course will consist of 2 three-hour lectures and is designed to acquaint the participant with the skills to formulate, solve and analyze solutions to linear programming problems. Emphasis will be placed upon the computational techniques known as the simplex and revised simplex algorithms and upon applications of duality theory.

Also included will be pedagogical pointers hopefully of benefit to the instructor who is new to the teaching of linear programming courses or courses in discrete mathematics having a linear programming component.

Those who hope to gain the most from the course may wish to review those parts of linear algebra dealing with solutions to systems of linear equations and with elementary properties of vector spaces.

Minicourse #2: *Discrete algorithmic mathematics*, organized by Stephen B. Maurer of Swarthmore College, will meet from 8:30 a.m. to 10:30 a.m. and from 7:30 p.m. to 9:30 p.m. on Thursday, January 26. There is much talk in the mathematics community about giving more time to discrete mathematics in the first two years of the mainstream undergraduate mathematics curriculum (and therefore less to calculus). There are claims that 1) a new course is needed, neither "finite math" nor "discrete structures"; 2) that this course needs to have a central theme; and 3) that it ought to teach the "algorithmic point of view." This minicourse will present one personal view consonant with these claims.

One need not be a specialist in computer science or combinatorics in order to teach a good freshman discrete course. The mathematics of algorithms involves basic mathematical ideas which all mathematicians are familiar with in other contexts. The organizer will try to make this clear by stripping away some of the unfamiliar terminology and formalisms and showing that there are interesting examples at the freshman level. He will discuss how to use the circle of ideas in induction/iteration/recursion to glue the course together and give a framework for the algorithmic viewpoint; illustrate how to keep lectures and problem sets away from the Scylla of dull play with definitions and the Charybdis of one subtle proof after another; and indicate how to give the course broad appeal to most students who take math (or should), not just future computer scientists. The presentation will involve general discussion of philosophy, comparison of some current texts, and presentation of the organizer's own syllabus and problem sets.

Minicourse #3: *Teaching problem solving*, organized by Alan H. Schoenfeld of the University of Rochester, will be held 8:00 a.m. to 10:00 a.m. on Friday, January 27, and 9:00 a.m. to 11:00 a.m. on Saturday, January 28. The MAA Committee on the Teaching of Undergraduate Mathematics (CTUM) recommends that "a series of problem solving courses at various levels of sophistication be developed and made regular

offerings in the standard curriculum." This minicourse develops the following five themes related to introducing a problem solving course:

- (1) Heuristics a la Pólya. An introduction to Pólya's "basic" problem solving strategies, with collections of sample problems.
- (2) On thinking mathematically: The big picture. What, beyond "basics," contributes to expertise? The notion of "control" or "executive" decisions.
- (3) What we know about thinking. Tidbits from the world outside mathematics, ranging from developmental psychology to artificial intelligence.
- (4) What students don't know about thinking. A close look at what really happens when students try to solve problems.
- (5) Teaching problem solving. A "nuts and bolts" discussion of problem solving in "ordinary" and special classes. Pointers to useful sources.

Minicourse #4: *Applications of discrete mathematics*, organized by Fred S. Roberts of Rutgers University, will be held from 2:00 p.m. to 4:00 p.m. on Friday, January 27 and 2:00 p.m. to 4:00 p.m. on Saturday, January 28. One of the reasons that discrete mathematics has become so important is the enormous variety of applications of the subject. This minicourse will explore these applications. The emphasis will be on several simple and traditional discrete techniques: basic counting rules of combinatorics, the principle of inclusion and exclusion, the notion of graph coloring, and the concept of eulerian path. These techniques will be quickly reviewed (though prior knowledge of combinatorics or graph theory will not be necessary). Applications will include switching functions in computer science, DNA chains in genetics, power in simple games in economics and political science, scheduling and operations research, engineering problems involving telecommunications and mobile radio transmission, urban sciences, computer graph plotting of electrical networks, and keypunching errors in computing.

Minicourse #5: *Problems from industry*, organized by Jeanne L. Agnew and Marvin S. Keener, both of Oklahoma State University, will be held 1:00 p.m. to 3:00 p.m. on Friday, January 27 and Saturday, January 28. This minicourse is based on problems obtained under the direction of the organizers from representatives of industries who were willing to share their expertise in order to help provide the undergraduate student an opportunity to deal with a realworld problem in its raw form. These problems have arisen in the work of the industry presenting them, and can be solved, at least in part, using only undergraduate mathematics. They have been written up by the organizers in a format suitable for classroom use. A catalog of these industrial problems will be available to the participants. The minicourse will focus on a discussion of selected problems already developed, and on the identification and development of a new problem with the help of an industrial representative.

Minicourse #6: *An introduction to the mathematical techniques and applications of computer graphics* is being organized by Joan Wyzkoski of Bradley University, and will be given from 1:00 p.m. to 3:00 p.m. on Friday, January 27 and Saturday, January 28. Graphs and illustrations of geometrical objects are useful tools in the teaching of mathematics. Computer graphics simplifies the production of these teaching aids. This minicourse will present some of the mathematical techniques used to produce realistic pictures on graphics terminals. Emphasis will be on the use of these techniques to

(continued on page vi)

MAA PROGRAM

Thursday, January 26

8:30 a.m.-10:30 a.m.	MAA Minicourse #2: <i>Discrete algorithmic mathematics</i> , Stephen B. Maurer, Swarthmore College
9:00 a.m.-4:00 p.m.	MAA Board of Governors Meeting
2:00 p.m.-4:00 p.m.	MAA Minicourse #1: <i>Linear programming</i> , Charles E. Haff, University of Waterloo
7:00 p.m.-10:00 p.m.	Joint Concerns Committee for Mathematics Session: <i>National Meeting of Department Chairmen</i>
7:30 p.m.-9:30 p.m.	MAA Minicourse #2: <i>Discrete algorithmic mathematics</i> , Second session

Friday, January 27

8:00 a.m.-10:00 a.m.	MAA Minicourse #3: <i>Teaching problem solving</i> , Alan H. Schoenfeld, University of Rochester
8:00 a.m.-10:00 a.m.	MAA Minicourse #7: <i>CONDUIT microcomputer software</i> , David A. Smith, Duke University
9:00 a.m.-9:50 a.m.	MAA Invited Address: <i>Some examples of combinatorial averaging</i> , Herbert S. Wilf, University of Pennsylvania
	MAA Invited Address: <i>The computer as a grader</i> , Melvin Maron, University of Louisville
10:00 a.m.-10:50 a.m.	MAA Invited Address: <i>Mathematics in industry—How do problems arise?</i> , Henry O. Pollak, Central Staff Organization for the Regional Bell Operating Companies
10:00 a.m.-noon	MAA Minicourse #8: <i>NonCONDUIT microcomputer software</i> , David A. Smith, Duke University
11:00 a.m.-11:50 a.m.	MAA Invited Address: <i>Computational geometry: paradigms and applications</i> , Frances Yao, Xerox Corporation
	MAA Panel Discussion: <i>Issues in remediation</i> , Moderator: Joan Leitzel, Ohio State University
Noon-12:50 p.m.	MAA Business Meeting: Presentation of the Lester R. Ford Awards and the Chauvenet Prize
1:00 p.m.-3:00 p.m.	MAA Minicourse #6: <i>Applications of computer graphics</i> , Joan Wyzkoski, Bradley University
1:00 p.m.-3:00 p.m.	MAA Minicourse #5: <i>Problems from industry</i> , Jeanne L. Agnew and Marvin S. Keener, both of Oklahoma State University
2:00 p.m.-4:00 p.m.	MAA Minicourse #4: <i>Applications of discrete mathematics</i> , Fred S. Roberts, Rutgers University
2:00 p.m.-4:00 p.m.	MAA Minicourse #1: <i>Linear programming</i> , Second session
4:00 p.m.-6:00 p.m.	MAA Section Officers Meeting

Program Committee: Ronald L. Graham (chairman), C. E. Burgess, Thomas J. Kearns, Peter A. Lindstrom, Arthur M. Riehl, David P. Roselle (ex-officio)

Saturday, January 28

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| 8:00 a.m.-8:55 a.m. | MAA Film: <i>Challenge in the Classroom</i> , a film by the late R. L. Moore |
| 9:00 a.m.-9:50 a.m. | MAA Retiring Presidential Address: <i>Reflections on the Mystique of R. L. Moore</i> , Richard D. Anderson, Louisiana State University |
| 9:00 a.m.-11:00 a.m. | MAA Minicourse #3: <i>Teaching problem solving</i> , Second session |
| 9:00 a.m.-11:00 a.m. | MAA Minicourse #7: <i>CONDUIT microcomputer software</i> , Second session |
| 10:00 a.m.-10:50 a.m. | MAA Invited Address: <i>Beta and gamma functions from Euler to Selberg and beyond</i> , Richard A. Askey, University of Wisconsin |
| | MAA Committee on Corporate Members: <i>Session on mathematics publishing, copyright, and software</i> , Moderator: Jerry Lyons, Prindle, Weber, and Schmidt |
| 11:00 a.m.-11:50 a.m. | MAA Invited Address: <i>Non-expansive maps</i> , Andrew M. Gleason, Harvard University |
| 11:00 p.m.-12:50 p.m. | MAA Panel Discussion: <i>Beginning integration: calculus and discrete mathematics in the first two years</i> , Moderator: Martha Siegel, Towson State University |
| 11:00 a.m.-1:00 p.m. | MAA Minicourse #8: <i>NonCONDUIT microcomputer software</i> , Second session |
| Noon-12:50 p.m. | MAA Invited Address: <i>Turning good mathematics into good TV</i> , Ross L. Finney and Donald Berman, COMAP |
| 1:00 p.m.-3:00 p.m. | MAA Minicourse #5: <i>Problems from industry</i> , Second session |
| 1:00 p.m.-3:00 p.m. | MAA Minicourse #6: <i>Applications of computer graphics</i> , Second session |
| 2:00 p.m.-4:00 p.m. | MAA Minicourse #4: <i>Applications of discrete mathematics</i> , Second session |
| 3:30 p.m.-5:30 p.m. | Progress Report on the Clarkson Institute for Retraining in Computer Science under the Auspices of the Joint ACM/MAA Committee: Moderator: Donald L. Kreider, Dartmouth College |

Local Arrangements Committee

W. Wistar Comfort (ex-officio), Roger H. Geeslin (publicity director), Thomas L. Holloman, William J. LeVeque (ex-officio), David P. O'Toole, David P. Roselle (ex-officio), Richard Werle, W. Wiley Williams (chairman).

Minicourses (continued from page iii)

complement mathematics instruction. Some of the topics to be discussed are curve and surface sketching, 2D and 3D transformations, perspective drawing, and hidden line removal. Since personal computers will be available for demonstrations and in-class implementations, programming experience is necessary.

Minicourse #7: *CONDUIT* microcomputer software is being organized by David A. Smith of Duke University and is being held from 8:00 a.m. to 10:00 a.m. on Friday, January 27, and from 9:00 a.m. to 11:00 a.m. on Saturday, January 28. It is a minicourse intended for college teachers. Uses of existing microcomputer software to enhance instruction in full courses in the undergraduate curriculum will be demonstrated. Included will be software for use in single- and multi-variable calculus, differential equations, and topics at the lower division college level. Presentations will be given by mathematicians who have developed the software and have had extensive experience with its use in their courses. It is planned for participants to have the opportunity to work with the software themselves on microcomputers.

Minicourse #8: *NonCONDUIT* microcomputer software is also being organized by David A. Smith and will be held from 10:00 a.m. to 12 noon on Friday, January 27, and from 11:00 a.m. to 1:00 p.m. on Saturday, January 28. It will be identical to minicourse #7 with the exception that only materials produced by individuals and organizations other than CONDUIT will be demonstrated.

The Minicourses are open only to persons who have registered for the Joint Mathematics Meetings and paid the Joint Meetings registration fee.

The Minicourses have separate registration fees of \$20 each, and are limited to 30 participants each. Payment of the fee(s) must be made to the Minicourse Cashier at the meeting registration desk in Louisville two hours prior to the beginning of the Minicourse or the reservation will be relinquished to someone on the waiting list. When making payment, the participant should present the confirmation to the cashier. "Standby" reservation confirmations will be issued to participants whose preregistration was received after the Minicourse was filled. These individuals should check with the Minicourse Cashier one hour prior to the Minicourse to see if any openings have occurred.

If the only reason for registering for the Joint Meetings is to gain admission to a Minicourse, this should be indicated by checking the appropriate box on the preregistration form. Then, if the minicourse is full, full refund can be made of the Joint Mathematics Meetings preregistration fees. Otherwise, the Joint Meetings preregistration will be processed, and then be subject to the 50 percent refund rule.

Transparencies

Speakers wishing to prepare transparencies in advance of their talk will find the necessary materials and copying machines at this section of the registration desk. A member of the staff will assist and advise speakers on the best procedures and methods for preparation of their material. There is a modest charge for these materials.

ACTIVITIES OF OTHER ORGANIZATIONS

The **American Mathematical Society** (AMS) will hold its 90th Annual Meeting from Wednesday, January 25 through Sunday, January 29. The Fifty-seventh Josiah Willard Gibbs Lecture will be presented at 8:30 p.m. on Wednesday, January 25 by Herbert A. Simon of Carnegie-Mellon University. Professor Simon will speak on *Computer programs that model the process of scientific and mathematical discovery*.

There will be a series of four Colloquium Lectures presented by Barry Mazur of Harvard University. The title of this lecture series is *On the arithmetic of curves*. The lectures will be given at 1:00 p.m. daily, Wednesday through Saturday, January 25-28.

The 1984 Bôcher Memorial Prize will be awarded at 4:00 p.m. on Thursday, January 26.

There will be eight invited one-hour addresses, twelve special sessions of twenty-minute papers, and contributed paper sessions.

The sessions of the Society will be preceded by a Short Course on *Mathematics of information processing* on January 23 and 24. The organizers for the Short Course are Michael Anshel, City College, CUNY, and William Gewirtz, Bell Laboratories, Holmdel.

The **Association for Women in Mathematics** (AWM) will sponsor a Panel Discussion on *Lipman Bers, a mathematics mentor* at 11:15 a.m. on Thursday, January 26. Speakers include Jane P. Gilman, Linda Keen (moderator), Irwin Kra, Tilla Klotz Milnor, Rubi E. Rodriguez, and Leslie Sidnor. The AWM Business Meeting will follow the Panel Discussion at 12:30 p.m.

A party is being planned for Thursday evening, January 26.

The fifth annual AWM Emmy Noether Lecture will be given at 10:00 a.m. on Friday, January 27, by Mary Ellen Rudin. Her title is *Paracompactness*.

The **National Association of Mathematicians** (NAM) will receive the William W. S. Claytor Lecture at 10:15 a.m. on Thursday, January 26, from A. T. Bharucha-Reid, who will speak on *Some notions and applications in probability theory—numerical methods*.

NAM will sponsor a Panel Discussion titled *Some approaches for providing computer literacy for students in small colleges and universities* at 11:15 a.m. on Friday, January 27. The list of speakers includes Melvis Atkinson, Samuel H. Douglas (moderator), Henry L. Hardy, John Harris, and Nelloise Watkins.

The NAM Business Meeting will take place at 1:30 p.m. on Friday, January 27.

The **National Science Foundation** (NSF) will sponsor an address on Thursday, January 26 at 2:15 p.m. The speaker is Judith S. Sunley, Acting Head of the Mathematical Sciences Section of NSF; her title is *The Mathematical Sciences at the National Science Foundation*.

The **Rocky Mountain Mathematics Consortium** (RMMC) will sponsor a symposium on *The mathematics of large scale simulation* at 2:15 p.m. on Friday, January 27.

The RMMC Board of Directors will meet at 2:00 p.m. on Thursday, January 26.

Louisville Meetings SuperPhone Exclusive

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FLY TO LOUISVILLE WITH DELTA OR USAIR AND SAVE

Delta and USAir, the two major carriers to Louisville, are making special round trip air fares available to the Joint Mathematics Meetings in Louisville, Kentucky, January 23–28, 1984.

Delta is offering a 30 percent discount on full round-trip coach fares. This special fare requires departure between January 23 and 27. Reservations and ticketing must be done at least seven days in advance and a maximum stay of 15 days will be permitted.

USAir is offering an unrestricted Super Saver fare to any participant purchasing tickets on its airline at least fourteen days in advance. Other fares will, of course, still be available after the fourteen-day limitation.

These special offers are available **ONLY** through the Louisville Meeting SuperPhone Exclusive.

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Where discounts exceed 30 percent, they will be provided automatically through SuperPhone's FARE CHECK system.

OTHER EVENTS OF INTEREST

Book Sales

Books published by the AMS and MAA will be sold for cash prices somewhat below the usual prices when these same books are sold by mail. **These discounts will be available only to registered participants wearing the official meeting badge.** Visa and MasterCard credit cards will be accepted for book sale purchases at the meeting. The book sales will be open the same days and hours as the Joint Mathematics Meetings registration desk (except on Saturday, January 28, when they will close at 2:00 p.m.) and are located in Exhibit Space C of the Commonwealth Convention Center.

Exhibits

The book and educational media exhibits are located in Exhibit Space C of the Commonwealth Convention Center and will be open Wednesday, January 25, through Saturday, January 28. The exhibits will be open from 1:00 p.m. to 5:00 p.m. on Wednesday; from 9:00 a.m. to 5:00 p.m. on Thursday and Friday; and from 9:00 a.m. to noon on Saturday. All participants are encouraged to visit the exhibits during the meeting. **Participants visiting the exhibits will be asked to display their meeting badge in order to enter the exhibit area.**

Rare Book Exhibit

The University of Louisville (Belknap Campus) will mount an exhibition of rare books from the William Marshall Bullitt Collection of Mathematics and Astronomy

in the Department of Rare Books on the ground floor of the Ekstrom Library. The library is approximately 20 blocks south of the Commonwealth Convention Center, off Third Street. Directions for reaching the university campus can be obtained at the Local Information Section of the meetings registration desk. Those interested are invited to view the exhibition between 9:00 a.m. and 6:00 p.m., Wednesday through Friday.

Employment Register

The Mathematical Sciences Employment Register, held annually at the Joint Mathematics Meetings in January, provides opportunity for mathematical scientists seeking professional employment to meet employers who have positions to be filled.

The Employment Register at the Louisville meeting will take place in the Commonwealth Convention Center, Exhibit Space A, on Thursday, Friday, and Saturday, January 26, 27, and 28, 1984. A short (optional) orientation session will be conducted by the AMS-MAA-SIAM Committee on Employment Opportunities at 9:00 a.m. on Thursday, January 26, to familiarize participants with the operation of the register.

All participants in the Employment Register are required to register for the Joint Meetings. For applicants, there is no additional fee for participation in the Employment Register. For employers, additional fees for participation in the Employment Register are \$50 for preregistration or \$75 if paid at the meeting.

MISCELLANEOUS INFORMATION

Child Care

We Sit Better, Inc., offers professional babysitting in hotel rooms. Day or evening service is available. Their present rate is minimum wage for a minimum of four hours, plus \$3 carfare. Please notify them as far in advance as possible. For more information call 502-583-9618. Many of the listed hotels will arrange for a babysitter if given enough prior notice.

Local Information

Taxis presently cost \$1.90 for the first mile and \$1 for each additional mile. Each additional person is charged 30 cents extra, as long as they go from the same pickup point to the same destination. Fares from the airport to downtown hotels should average \$9. The Transit Authority of River City (TARC) operates buses throughout the area. The fee is 60 cents during peak hours (6:30-8:30 a.m. and 3:30-5:30 p.m.) and 35 cents for nonpeak hours.

A section of Fourth Avenue has been turned into a Galleria and pedestrian mall. Participants staying in downtown hotels will want to take advantage of the many shops in this area.

Louisville's museums include the J. B. Speed Art Museum, the Museum of History and Science, the Howard Steamboat Museum and the Kentucky Derby Museum at Churchill Downs. The performing arts can be seen at Actors Theatre, Kentucky Center for the Arts, Macauley Theatre, and the Louisville Palace. Information on these and other points of visitor interest will be available at the Local Information section of the registration desk.

Parking

Parking lots within a few blocks of the Commonwealth Convention Center charge from 35 cents to 75 cents for one hour (50 cents median); twenty-four hour parking ranges from \$1 to \$3.50 (\$3 median).

The Hyatt Regency has its own parking garage at Third Street and River City Mall at a daily charge of \$3. This garage is also available for patrons of the Commonwealth Convention Center.

The Galt House has a 600-car parking lot which guests can use at no charge, with in and out privileges.

Social Events

The Local Arrangements Committee has arranged a no-host cocktail party for Friday, January 27, from 7:00 to 9:00 p.m., in the Regency Ballroom North at the Hyatt Regency Louisville.

Travel

In January, Louisville is on Eastern Standard Time. There is regular airline service to Standiford Field by several major airlines.

The airport in Louisville is approximately four miles from downtown and the trip takes about ten minutes. The airport limousine stops at the major downtown hotels, and runs every forty-five minutes from 7:00 a.m. until 11:00 p.m. daily. Present cost is \$3.75 per person. A taxi from the airport to a downtown hotel costs about \$8.50, plus 30 cents for each additional passenger one way. There is bus service provided by Transit Authority of River City (TARC) on bus #2 from the airport to downtown, with the fare varying between 35 cents and 60 cents depending on the hour of the day. Most major car rental agencies maintain desks at the airport.

Louisville can be reached by car via I-65 from the North and South, I-64 from the East and West, and I-71 from the Northeast.

There is no passenger train service into Louisville; however, Greyhound and Trailways Bus Lines serve the Louisville area.

Weather

Louisville is located on the south bank of the Ohio River. The climate, while continental in type, is of a variable nature because of its position in the midlatitudes. The winters are moderately cold with temperatures rarely below 0°F. The mean temperature in January is 34°F while the average high temperature in January is 42°F and the average low temperature is 26°F. On rare occasions the winters in Louisville are extreme both in temperature and snowfall.

Registration Desk Services (continued from page ii)

Telephone Messages

A telephone message center is located in the registration area to receive incoming calls for participants. The center is open from January 25 through 28 only, during the hours that the Joint Mathematics Meetings registration desk is open. Messages will be taken and the name of any individual for whom a message has been received will be posted until the message has been picked up at the message center.

Check Cashing

The meeting cashier will cash personal or travelers' checks up to \$50, upon presentation of the official meeting registration badge, provided there is enough cash on hand. Canadian checks must be marked for payment in U.S. funds.

Local Information

This section of the desk will be staffed by members of the Local Arrangements Committee and other volunteers from the Louisville mathematical community.

Lost and Found

See the meeting cashier.

Mail

All mail and telegrams for persons attending the meetings should be addressed to the participant, c/o Joint Mathematics Meetings, Commonwealth Convention Center, 221 Fourth Avenue, Louisville, Kentucky 40202. Mail and telegrams so addressed may be picked up at the mailbox in the registration area during the hours the registration desk is open. U.S. mail not picked up will be forwarded after the meeting to the mailing address given on the participant's registration record.

Personal Messages

Participants wishing to exchange messages during the meeting should use the mailbox mentioned above. Message pads and pencils are provided. It is regretted that such messages left in the box cannot be forwarded to participants after the meeting is over.

Assistance, Comments and Complaints

A log for registering participants' comments or complaints about the meeting is kept at the Transparencies section of the registration desk. All participants are encouraged to use this method of helping to improve future meetings. Comments on all phases of the meeting are welcome. If a written reply is desired, participants should furnish their name and address.

Participants with problems of an immediate nature requiring action at the meeting should see the meeting manager, who will try to assist them.

The Institute will operate with two classes next summer, the returning class from this year and approximately 40-80 new students. Additional information and application forms for the Institute may be obtained from: Professor Ed Dubinsky, Department of Mathematics and Computer Science, Clarkson College, Potsdam, NY 13676. (315-268-2382.)

The ACM/MAA Committee is now laying plans to extend its efforts to additional retraining models and to evaluation and support of other existing programs. It will conduct a panel discussion on retraining in computer science at the Annual MAA Meeting in Louisville on Saturday, January 28 at 3:30 p.m. Members of the Committee are: Susan Devlin, Central Staff Organization-Bell Laboratories; Terry Frederick, University of Central Florida; Patricia Goldberg, IBM; Zaven Karian, Denison University; Donald Kreider (chair), Dartmouth College; Anthony Ralston, State University of New York at Buffalo; and Olaf Stackelberg, Kent State University.

Two-Year College Mathematics Journal to be Renamed College Mathematics Journal

Based on the recommendations of the new and past *TYCMJ* Editorial Boards, the Committee on Two-Year Colleges, and the Committee on Publications and sampled views from MAA members, the Board of Governors has voted to change the name of the *Two-Year College Mathematics Journal* to the *College Mathematics Journal*. This name change will be effective with the January 1984 issue.

At present, more than two-thirds of the *TYCMJ*'s subscribers are faculty in four-year colleges and universities. Evidently, this journal is meeting the needs of a much wider audience than just those of faculty in two-year colleges. The new title, the *College Mathematics Journal (CMJ)*, recognizes the wide readership that the journal has attracted.

The name change is only a change in title. There will be no significant change in content, format, or philosophy. The *CMJ* will continue to publish articles ranging from senior high school through third year college-level mathematics, the primary emphasis being on the first two years of college mathematics. The *CMJ*'s style will continue to be user-friendly.

It is believed that the journal's name change will further attract and involve colleagues from all levels of mathematics. Contributions to the *CMJ* are especially welcome from teachers in high schools, two-year colleges, and teachers of freshman-sophomore level courses in four-year colleges and universities.

Plans for ICME-5 Announced

The Fifth International Congress on Mathematical Education (ICME-5) will be held in Adelaide, Australia on August 24-30, 1984. Organized by an International Program Committee chaired by Michael Newman and a National Committee chaired by Marjorie Carss, ICME-5 follows the earlier congresses held in Lyons, France (1969), Exeter, England (1972), Karlsruhe, West Germany (1976), and Berkeley, California (1980).

Since the first ICME, these congresses have become the major international forum for mathematics education from elementary school through college. ICME-5 will inaugurate several new features designed to add new vitality to the exchange of ideas. For example, the Congress will be split into relatively small working groups on a number of occasions in order to involve participants more actively in the discussions. In one session there will be seven simultaneous

groups dealing with: elementary, secondary, post-secondary, preservice teacher, adult, technical, and vocational education. At another session the participants will be divided into groups to discuss such topics as mathematics for all, the professional life of teachers, technology, problem-solving, curriculum development, applications, and research.

Each day will be divided into five sessions beginning at 8:30 a.m. and lasting into the evening, with breaks during the day. In addition to the innovative sessions described above, there will be sessions devoted to more traditional activities, such as lectures, debates, and mini-conferences.

Opening and plenary sessions will be held on Friday, August 24, with additional plenary sessions on August 27 and 30. Speakers at plenary sessions will include Ubiratan d'Ambrosio (Brazil), Jeremy Kilpatrick (USA), Renfrey Potts (Australia), and A.P. Yushkevich (USSR).

The program committees are planning to include at ICME-5 several topics of discussion not adequately covered at earlier congresses. Some topics which have been announced are: evaluation and assessment, diagnosis and remediation, information and documentation, women and mathematics, mathematics competitions, and distance education. There will be sessions concerned with the teaching of particular topics, many not in the traditional curriculum. There will also be poster sessions, project presentations, meetings of leaders of mathematical organizations, film presentations, and computer sessions.

Organizers for these special sessions have been named, including, from the USA: Tom Cooney, F. Joseph Crosswhite, Suzanne K. Damarin, E. Glenadine Gibb, Jeremy Kilpatrick, Richard Lesh, Joseph N. Payne, Anthony Ralston, and Alan Schoenfeld.

Excursions during ICME-5 and several pre-congress tours are being planned which will enable delegates to visit interesting parts of Australia and New Zealand and still return to the U.S. by September 1.

The organizers of ICME-5 have appointed an official U.S. agent for information about the program and travel arrangements. Interested persons may obtain the official ICME-5 brochure, which contains program information and registration/reservation forms by writing to: ICME-5 TRAVEL PLANNERS, P.O. Box 32366, San Antonio, TX 78216. (Telephone: 512-341-8131.)

ICME-5 Travel Grants

There is a good chance that MAA will receive funding for 20-25 travel grants to ICME-5. The awards will be made by a joint MAA/NCTM (National Council of Teachers of Mathematics) selection committee on the basis of applications received by MAA and NCTM before March 1, 1984.

The awards will not exceed the traveller's actual transportation costs to the Congress and may be further limited by a ceiling determined by the terms of the grant to the MAA. Recipients of travel grants will be expected to submit written reports based on their participation in the Congress.

Persons interested in applying for travel grants should send name and address to: ICME-5 Travel Grants, MAA, 1529 Eighteenth St., N.W., Washington, D.C. 20036. Application materials will be mailed to these persons when funding has been assured.

Ken Ross Elected MAA Secretary



Professor Kenneth A. Ross of the University of Oregon has been elected by the MAA Board of Governors to serve as MAA Secretary starting in January 1984. The current Secretary, David P. Roselle, announced his resignation as MAA Secretary, effective at the end of the year, after accepting the position of Provost of the Virginia Polytechnic and State

University.

Leonard Gillman, a long-time friend and associate of Ken Ross, introduced Professor Ross at the MAA Business Meeting in Albany last August with these remarks:

Kenneth A. Ross, Professor of Mathematics at the University of Oregon, will be the new Secretary of the Association, starting January 1984. Secretaries of the Association do not come and go. In the 24 years that have elapsed since the time Harry Gehman was able to handle all the administrative work single-handedly, there have been only two: David Roselle for the past nine years, and, before that, Henry Alder for 15. Kenneth Ross, in turn, has pledged a long-term commitment to the position.

Professor Ross was born in Chicago. He gives his age as "65 years old in the year 2001." In 1956 he acquired a B.S. from the University of Utah, moved to the University of Washington to begin his graduate studies, and joined the Mathematical Association of America. He earned his doctorate in 1960, under the direction of Edwin Hewitt. He taught at Washington, Rochester, and then Oregon, where he has been since 1964 except for a one-year excursion as a visitor at Yale and a 3-year period at Washington as a Sloan Foundation Fellow.

Ross' research interest is real analysis, particularly abstract harmonic analysis over topological groups. He has published several dozen papers and a number of books, notably the two-volume *Abstract Harmonic Analysis* (with Edwin Hewitt), and *Elementary Analysis: The Theory of Calculus*, both published by Springer. At the moment he is working feverishly to finish a book on discrete mathematics before plunging into the time-consuming job of Secretary. He has some inkling of what the job is like: for 11 years (1970-81) he was Associate Secretary for the Far Western Section of the American Mathematical Society.

Professor Ross is a full 5'3" tall. Both his daughters, one a flutist and the other a horn player, tower over him. But he is spunky. He is marching around the meeting with two broken fingers bandaged up. How did he break them? Playing basketball.

Professor Ross is not well known by MAA members for his work on committees. That is not surprising, as he hasn't been on any. (But he has spoken at a section meeting and published articles in the *Monthly*.) This may seem like a drawback for his new job, but history suggests the opposite: both Henry Alder and David Roselle had had but minimal MAA committee experience before becoming Secretary. Just as David Roselle (size 8½) stepped so successfully into Henry Alder's shoes (size 10½), we look forward to having Kenneth Ross (size 6½) step into David Roselle's.

FEC and RISE Offer Opportunities to College Faculty

Faculty Exchange Center (FEC)

FEC is a non-profit, faculty-administered program which publishes a directory with about 500 listings, including many international listings, of college and university faculty members in all subject areas who wish to make teaching and/or housing exchanges. Individuals registered with FEC pay a fee of \$14; the current issue of the directory may be obtained for an additional \$4. Institutional memberships are available for \$85.

The FEC directory is published each fall. House exchange supplements are published each fall and each spring. For

additional information, write to: Faculty Exchange Center, 952 Virginia Avenue, Lancaster, PA 17603.

Register for International Service in Education (RISE)

RISE is a computer-based referral service designed to enable universities, technical institutes, research centers, etc. outside the United States to locate qualified educators, researchers, and consultants for education-related assignments. These assignments may range in duration from a few weeks to several years. The majority of the positions registered with RISE by overseas educational institutions are at the university level and require the Ph.D. or the Master's degree with considerable experience. RISE has many positions for teachers of mathematics and for mathematics educators specializing in teacher training. There is a \$35 registration fee. For additional information, write to: Register for International Service in Education, 809 United Nations Plaza, New York, NY 10017.

The MAA Sabbatical Exchange Information Service (SEIS) has been discontinued. Despite efforts during the past two years to increase participation in SEIS, the number of listings in the SEIS Directory continued to be too small for the program to be effective.

MAA members interested in faculty exchanges or in temporary positions abroad are urged to register with FEC or RISE. Anyone with information about other similar programs which might be of interest to MAA members should write to the *FOCUS* editor.

Special Issue of *Mathematics Magazine* Celebrates Euler's Life

All the noted mathematicians of the present day are his (Euler's) pupils: there is no one of them who has not formed himself by the study of his works, who has not received from him the formulas, the method which he employs, who is not directed and supported by the genius of Euler in his discoveries.

Marquis de Condorcet, *Eloge de M. Euler*, in *Histoire de l'Académie royale des sciences pour l'année 1783* (Paris, 1786).

The genius of Euler, which produced such a profound impact on the mathematics of his day, can still be seen in virtually every area of 20th century mathematics. To mark 200 years since Euler's death, the MAA gives tribute to his life and work in a special November issue of *Mathematics Magazine*. Seven invited articles and an extensive glossary of mathematical items which bear Euler's name provide interesting material which could be used in several college mathematics courses including number theory, analysis, problem-solving, and history.

The special November issue has been mailed to all regular *Mathematics Magazine* subscribers. Additional copies may be purchased for \$4 each from: Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036.

New CUPM Panel Formed

A new CUPM (Committee on the Undergraduate Program in Mathematics) panel entitled COMET—Panel on COntinuing Mathematical Education of Teachers—has been formed. The panel will help devise ways to train teachers for new methods of delivery and subject matter, attempt to exert influence on legislation, identify superior programs, and make recommendations about retraining for teachers.

People in the News

Three MAA members have been selected to receive the 1983 Presidential Awards for Excellence in Science and Mathematics Teaching. They are **Margaret M. Bondrew** of Medway Junior-Senior High School in Medway, Massachusetts, **Charles L. Hamberg** of Adlai E. Stevenson High School in Prairie View, Illinois, and **Alfred Kalfus** of Babylon Junior-Senior High School in Babylon, New York. They are among the one hundred and four science and mathematics teachers representing every state, the District of Columbia, and Puerto Rico who were honored in Washington, D.C. in October for their outstanding contributions in the areas of science and mathematics teaching. The National Science Foundation will award a grant of \$5000 to each teacher's school to be used "to supplement but not replace other resources for use in improving its science and mathematics program."



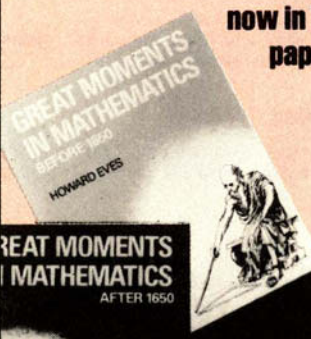
Ronald M. Davis, Professor of Mathematics at Northern Virginia Community College, has received the 1983 William C. Lowry Outstanding Mathematics Teacher of the Year Award for the college level. The award is presented by the Virginia Council of Teachers of Mathematics. Professor Davis was recognized for his involvement in course development,

producing widely used instructional materials, and his innovational and inspirational teaching. In addition to being widely recognized as a leader in community and technical college mathematics education, Professor Davis has served on more than a dozen national committees of the MAA. *Karen Uhlenbeck, whose MacArthur Foundation award was announced in the September-October issue of FOCUS, is on leave from her position as Professor of Mathematics at the University of Illinois at Chicago.—Editor.*


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In Memoriam

Brent G. Clark, Professor Emeritus from Vanderbilt University, died April 30, 1983 at the age of 84. He was a member of the MAA for 48 years.

L. Earle Bush, Professor Emeritus from Kent State University, died May 27, 1983 at the age of 83. He was a member of the MAA for 50 years.

James P. Williams of Indiana University at Bloomington, died May 1, 1983. He was a member of the MAA for 25 years.

Viktors Linis, Professor Emeritus from the University of Ottawa, died July 2, 1983 at the age of 66. He was a member of the MAA for 30 years.

Chester G. Jaeger, retired from Pomona College, died April 27, 1983 at the age of 86. He was a member of the MAA for 63 years.

Gustave A. Efroymsen of the University of New Mexico, died August 13, 1983 at the age of 46. He was a member of the Association for 13 years.

The Association has also been informed of the deaths of the following individuals: **Frederick J. Burkett** of Waco, Texas, an MAA member for 61 years; **Geneva M. Smith** of East Corinth, Maine, an MAA member for 50 years; **George A. Parkinson** of Oostburg, Wisconsin, an MAA member for 56 years; **Robert P. Kopp** of San Diego, California, an MAA member for 20 years; **David S. Maier** of Kingston, Ontario, Canada, an MAA member for 5 years; **George Millman** of Wanamassa, New Jersey, an MAA member for 31 years; **Walbert C. Kallnowski** of Collegeville, Minnesota, an MAA member for 35 years; **David Kotler** of Kingston, New York, an MAA member for 35 years; **Richard V. Olson** of Worcester, Massachusetts, an MAA member for 21 years.

Awards Presented to Journal Authors

Five articles appearing in 1982 issues of the *Two-Year College Mathematics Journal* and *Mathematics Magazine* have been selected as examples of outstanding expository writing. The authors of these articles were presented with awards at the MAA Business Meeting in Albany, New York, on August 9, 1983.

George Pólya Awards for articles in the *Two-Year College Mathematics Journal* in 1982 were given to:

- Douglas R. Hofstadter of Indiana University for "Analogies and Metaphors to Explain Gödel's Theorem," March 1982, pages 98-114.
- P. R. Halmos of Indiana University for "The Thrills of Abstraction," September 1982, pages 243-251.
- Warren Page of New York City Technical College and V. N. Murty of Penn State University, Capitol Campus for "Nearness Relations Among Measures of Central Tendency and Dispersion, Part 1," November 1982, pages 315-327.

Carl B. Allendoerfer Awards for articles in *Mathematics Magazine* in 1982 were presented to:

- Donald O. Koehler of Miami University of Ohio for "Mathematics and Literature," March 1982, pages 81-95. (Awarded posthumously.)
- Clifford H. Wagner of Penn State University, Middletown for "A Generic Approach to Iterative Methods," November 1982, pages 259-273.

Each prize winning author(s) received a check for \$200.

Calendar

National MAA Meetings

67th Annual Meeting, Louisville, Kentucky, January 26-28, 1984.
64th Summer Meeting, Eugene, Oregon, August 16-19, 1984.

68th Annual Meeting, Anaheim, California, January 11-13, 1985.
69th Annual Meeting, New Orleans, Louisiana, January 9-11, 1986.

Sectional MAA Meetings

Allegheny Mountain Washington & Jefferson College, Washington, Pennsylvania, April 13-14, 1984.
Eastern Pennsylvania & Delaware Bryn Mawr College, Bryn Mawr, Pennsylvania, November 19, 1983.
Florida University of Tampa, Tampa, Florida, March 9-10, 1984.
Illinois Eastern Illinois University, Charleston, Illinois, April 27-28, 1984.
Indiana Rose Hulman Institute of Technology, Terre Haute, Indiana, April 14, 1984.
Intermountain Ricks College, Rexburg, Idaho, April 27-28, 1984.
Iowa Wartburg College, Waverly, Iowa, April 13-14, 1984.
Kansas Bethel College, North Newton, Kansas, March 30-31, 1984.
Kentucky Centre College, Danville, Kentucky, March 30-31, 1984.
Louisiana-Mississippi Southeastern Louisiana University, Hammond, Louisiana, February 17-18, 1984.
Maryland-DC-Virginia University of the District of Columbia, Van Ness Campus, Washington, D.C., November 18-19, 1983.
Metropolitan New York College of Mount St. Vincent, Riverdale, New York, May 6, 1984.
Michigan University of Michigan, Ann Arbor, Michigan, May 4-5, 1984.
Missouri Southeast Missouri State University, Cape Girardeau, Missouri, April 27-28, 1984.

Nebraska Nebraska Wesleyan University, Lincoln, Nebraska, April 13-14, 1984.
New Jersey Kean College, Union, New Jersey, November 5, 1983.
North Central Macalester College, St. Paul, Minnesota, April 27-28, 1984.
Northeastern Providence College, Providence, Rhode Island, November 18-19, 1983.
Northern California San Francisco State University, San Francisco, California, February 25, 1984.
Ohio Baldwin-Wallace College, Berea, Ohio, November 4-5, 1983.
Oklahoma-Arkansas Arkansas Tech University, Russellville, Arkansas, March 30-31, 1984.
Pacific Northwest In conjunction with National Meeting in Eugene, Oregon, August, 1984.
Rocky Mountain U.S. Air Force Academy, Colorado, April 27-28, 1984.
Seaway Niagara University, Niagara Falls, New York, November 4-5, 1983.
Southeastern Tennessee Tech University, Cookeville, Tennessee, April 6-7, 1984.
Southwestern Arizona State University, Tempe, Arizona, April 13-14, 1984.
Texas University of Texas at Tyler, Tyler, Texas, April 6-7, 1984.
Wisconsin St. Norbert College, DePere, Wisconsin, April 13-14, 1984.

Other Meetings

NOVEMBER 1983

7-9. **Joint National Meeting of the Operations Research Society of America and The Institute of Management Sciences**, Orlando, Florida. Contact: ORSA, 428 East Preston Street, Baltimore, MD 21202.

7-9. **Society for Industrial and Applied Mathematics Fall Meeting**, plus a special conference on parallel processing, November 10-11, Norfolk, Virginia. Contact: SIAM, Suite 1405, 117 South 17th Street, Philadelphia, PA 19103.

10-13. **American Mathematical Association of Two-Year Colleges Annual Convention**, Orlando, Florida. Contact: Bill Jordan, AMATYC Convention Chairman, Seminole Community College, Sanford, FL 32771. (305-323-1405.)

DECEMBER 1983

5-7. **Second series of Everett Pitcher Lectures**, Lehigh University. Lecturer: Jean-Pierre Serre of the College de France. Contact: Department of Mathematics, Lehigh University, Christmas-Saucon Hall 14, Bethlehem, PA 18015.

10-13. **Canadian Mathematical Society Annual Winter Meeting**, McGill University. Contact: M. Barr, McGill University, Montreal, Quebec, H3A 2K6, Canada.

JANUARY 1984

6-10. **NSF/CBMS Regional Conference**, "Some Global Problems Concerning Curvature of Riemannian Manifolds," Polytechnic Institute of New York. Lecturer: Jerry Kazdan. Contact: L. M. Sibner or E. Y. Miller, Polytechnic Institute of New York, 333 Jay Street, Brooklyn, NY 11201.

9-13. **NSF/CBMS Regional Conference**, "Minimax Methods in Critical Point Theory and Applications to Differential Equations," University of Miami. Lecturer: P. H. Rabinowitz. Contact: Shair Ahmad, Department of Mathematics and Computer Science, University of Miami, Coral Gables, FL 33124.

9-13. **Second series of William H. Roever Lectures in Geometry**, "Differential Systems and Isometric Imbeddings," Lecturer: Phillip A. Griffiths. Contact: Department of Mathematics, Washington University, St. Louis, MO 63130.

23-24. **AMS Short Course**, "Mathematics of Information Processing," Louisville, Kentucky. Contact: AMS, P.O. Box 6248, Providence, RI 02940.

23-25. **NCTM Seminar Series**, "Teaching Math With Microcomputers," Las Vegas, Nevada. Contact: NCTM, 1906 Association Drive, Reston, VA 22091.

25-29. **90th Annual Meeting of the American Mathematical Society**, Louisville, Kentucky. Contact: AMS, P.O. Box 6248, Providence, RI 02940.

25-29. **Meeting of the Association for Women in Mathematics**, Louisville, Kentucky. Contact: AWM, Women's Research Center, Wellesley College, 828 Washington Street, Wellesley, MA 02181.

APRIL 1984

19-21. **Fifteenth Annual Pittsburgh Conference on Modeling and Simulation**, University of Pittsburgh. Contact: William G. Vogt or Marlin H. Mickle, Modeling and Simulation Conference, 348 Benedum Engineering Hall, University of Pittsburgh, Pittsburgh, PA 15261.

25-28. **62nd Annual Meeting of the National Council of Teachers of Mathematics**, "Using Technology in Mathematics Education," San Francisco, California. Contact: NCTM, 1906 Association Drive, Reston, VA 22091.

MAY 1984

16-18. **NCTM Seminar Series**, "Teaching Math with Microcomputers," Miami, Florida. Contact: NCTM, 1906 Association Drive, Reston, VA 22091.

JUNE 1984

11-29. **Ohio Section Short Course**, "Systems Programming," Denison University. (See "Ohio Section to Offer Summer Course on Systems Programming" on page 4 of this issue.)

AUGUST 1984

24-30. **Fifth International Congress on Mathematical Education**, Adelaide, Australia. (See "Plans for ICME-5 Announced" on page 5 of this issue.)

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