FOCUS

THE NEWSLETTER OF THE MATHEMATICAL ASSOCIATION OF AMERICA

August/
September 1999

Volume 19, Number 6

In This Issue

American Mathematical Monthly Available Online

The contents of volumes 1-100 (1894–1993) of the *American Mathematical Monthly* are now available online at <www.jstor.org>. Each year, one volume will be added to the JSTOR archive, so that all but the most recent five years will be available.

For individuals who do not have access through their institutions, the MAA will soon provide information about how they can obtain access to the JSTOR *Monthly* archive for a modest fee.

High-resolution graphic images of pages can be viewed and printed, and rapid full text searching capability is provided. For example, readers interested in what the *Monthly* has had to say about Fenchel's theorem over the years will find 67 instances of "Fenchel" in volumes 1-100; clicking on the links returned by the search produces a citation of the article, or the first page containing the term in that article.

The JSTOR archive now contains complete runs of 117 journals in 15 disciplines, including 10 mathematics journals. JSTOR is a non-profit organization whose initial funding was provided by The Andrew W. Mellon Foundation; its ongoing support comes from participating institutions and libraries, who in turn provide access to the JSTOR archive for their members, students, and faculty. ■

25 Mathematicians Receive Section Teaching Awards

Henry Alder

Twenty-five mathematicians received this year's Section Distinguished Teaching Awards, which were conferred at the Spring meetings of their sections. The latest winners represent the eighth group of awards since the inception of the awards in 1992.

The Committee on the Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics has nominated at most three of these winners for the national Deborah and Franklin Tepper Haimo Awards. The MAA's Board of Governors acted on the nominations at the summer meeting in Providence, and the national award winners will speak of their successes as teachers at the annual meeting in Washington, D.C. in January 2000.

That 25 of the MAA's 29 sections, the largest number so far, selected awardees speaks well of the sectional support for the national effort to identify, reward, and honor outstanding college teachers of mathematics in the United States and Canada. Some sections routinely invite their award winners to address their section, and the national committee welcomes this practice as well as other ways of sharing the talents of these outstanding teachers. The national committee urges sections to nominate and reward outstanding teachers, and encourages all members of the Association to nominate worthy candidates. You may even nominate someone not in your section by writing to that person's section selection committee. The larger the pool of outstanding nominations, the easier it will be to maintain the high standards for sectional and national awards. ■

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Editor: Harry Waldman, MAA; hwaldman@maa.org

Managing Editor: Carol Baxter, MAA cbaxter@maa.org

Please address advertising inquiries to: Carol Baxter, MAA; cbaxter@maa.org

President: Thomas Banchoff, Brown University

First Vice-President: Anita Solow, Randolph-Macon Woman's College

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Letters to the editor should be addressed to Harry Waldman, MAA, 1529 Eighteenth Street, NW, Washington, DC 20036.

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American Mathematics Competitions Introduces New Contest, Format, and Names

The American Mathematics Competitions has introduced a new contest as well as new names and a modified format for two of its current exams. The new contest is called the American Mathematics Contest →10 (AMC →10), for students in grades 10 and below.

The AJHSME is now called the American Mathematics Contest →8 (AMC →8) and the AHSME is now called the American Mathematics Contest →12 (AMC →12). This contest will give more young students a chance to participate in a significant mathematical problem solving experience.

Why should a school sign up? Because the AMC →10 and AMC →12 provide an excellent opportunity to challenge students' mathematical abilities.

The AMC →10 and AMC →12 will each be 75 minutes long and consist of 25 questions each. Each correct answer is worth 6 points and a blank is worth 2 points. The AMC →10 and AMC →12 will have several questions in common and will be given at the same time, on the Tuesday before the third Monday in February (the current AHSME date).

Students should choose between AMC →10 and AMC →12. Students in 10th grade and under may take either the AMC →10 or AMC →12, but 11th and 12th grade students may not take the AMC →10. The school team score will be determined from the AMC →12. To qualify for the AIME a student must score at least 100 points on the AMC →12 or be in the top 1% of the AMC→10 participants.

The registration fee for one or both contests is $30.00. One bundle of ten AMC →12 tests is $12.00 and one bundle of ten AMC→10 tests is $10.00. The first bundle of the AMC→10 will be free for the year 2000. ■

1999–2000 AMC exam dates:

AMC→8—TUESDAY, November 14, 2000

AMC→10—TUESDAY, February 15, 2000

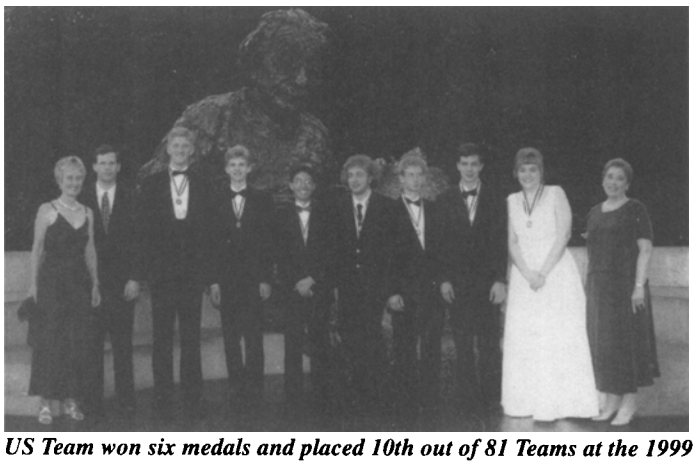
AMC→12—TUESDAY, February 15, 2000

AIME—TUESDAY, March 28, 2000

USAMO — TUESDAY, May 2, 2000

For more information contact:

Titu Andreescu, Director
American Mathematics Competitions
University of Nebraska, Lincoln
P.O. Box 81606
Lincoln, Nebraska 68501-1606
Telephone: 800-527-3690
FAX: 402-472-6087
Email: titu@amc.unl.edu
http://www.unl.edu/amc
http://www.maa.org



US Team won six medals and placed 10th out of 81 Teams at the 1999 IMO. China and Russia tied for first. *Shown with US team members are Marcia Sward, Executive Director of the MAA and Martha Siegel, Secretary of the MAA. USAMO members from left to right: Sasha Schwartz, Stephen E. Haas, Reid W. Barton, Po-Shen Loh, Lawrence O. Detlor, Gabriel D. Carroll, Paul A. Valiant, Melanie Eggers Wood.*

Ivan Niven Dies at 83

Gerald L. Alexanderson and Kenneth A. Ross

Ivan Niven, former MAA President, died in Eugene, Oregon, on May 9, 1999, after a series of illnesses.

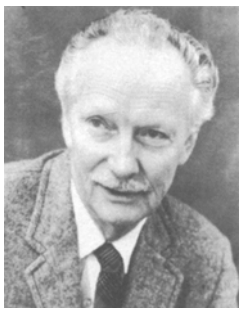
Ivan was born in Vancouver, B. C. on October 25, 1915, where he received his early education. He earned his Bachelor's (1934) and Master's (1936) degrees at the University of British Columbia, and his Ph.D. (1938) at the University of Chicago, where he worked with the famous algebraist and number theorist, Leonard Eugene Dickson.

Following his work with Dickson, in 1943 he settled some difficult cases of Waring's problem, one of the greatest problems of number theory. This prompted E. T. Bell to write that Waring's problem was "a conjecture that was propounded by an Englishman [and] was completely settled by the combined efforts of an Englishman, a German, a Russian, an Indian, a Texan, and a Canadian ...." Niven was the Canadian.

In 1938–1939 he held a postdoctoral research fellowship at the University of Pennsylvania. This was a valuable year because he was influenced by the eminent Hans Rademacher, and this is where he met Herbert Zuckerman, who became a life-long friend and co-author. Ivan then served on the faculty of the University of Illinois for three years and Purdue University for five years before returning to the Pacific Northwest in 1947 to join the faculty of the University of Oregon, where he was given the rank of Professor Emeritus in 1982.

He also held visiting appointments at the University of British Columbia (1953), Stanford University (1957–58) and the University of California, Berkeley (1964–65).

He married Betty Mitchell from Chicago in September 1939. Their son Scott, born in February 1942, now teaches mathematics and astronomy at Olympic College in Bremerton, Washington. For several decades, Betty was active in local community issues and served on local and state planning boards and other committees.



Ivan Niven

On Campus

At Oregon Ivan was a key figure in the department and, in particular, he played a major role in developing a Ph.D. program in mathematics. In fact, he was the advisor for the first three Oregon Ph.D.'s in mathematics: Luther Cheo (1950), John Maxfield (1951) and Margaret Maxfield (1951). In all, Ivan had sixteen Ph.D. students. Though he chose never to be department head or a dean at the University of Oregon, Ivan was a key figure across campus and was highly respected for his calm demeanor and sensible ideas.

He received the Charles E. Johnson Memorial Award at the June 1981 commencement. With the help and support of Ivan's student, Robert E. Dressler, the university endowed the Niven Lecture series which began in 1994. The speakers, so far, have been Hugh L. Montgomery, Persi Diaconis, Michael Artin and David Eisenbud.

Ivan Niven has been the complete mathematician who was noted for outstanding teaching, popular books, a life-long active research program, and generous service to the general mathematics community.

The first author (Alexanderson) was an undergraduate at the University of Oregon and took a course in applied mathematics from Ivan. This was well outside of Niven's primary areas of interest, but the course was so beautifully executed that it helped persuade Alexanderson to major in mathematics. Ivan was an outstanding lecturer, prized for his clarity and enthusiasm and his sense of humor. In this role he was in demand nationwide into the 1980s.

In 1951, he gave an invited address to the American Mathematical Society and a decade later he gave the prestigious series of Hedrick Lectures, which inspired the second author (Ross). During 1962–1966 he was a traveling lecturer of the Mathematical Association of America. Then in 1986 he gave the Leon Alaoglu Memorial Address at Cal Tech and the first in a series of annual Lonseth Lectures at Oregon State.

Published Works

Ivan published over sixty papers, some with well-known co-authors such as Samuel Eilenberg, Paul Erdös (6 times, so that by one reckoning his Erdös number was 1/6!), Nathan J. Fine, R. D. James, and H. S. Zuckerman (7 times). His areas of expertise were number theory, especially the areas of diophantine approximation and questions of irrationality and transcendance of numbers, and combinatorics.

The second author (Ross) found two of the articles of special interest: his famous 1947 paper containing a simple proof that pi is irrational—less than one page in the AMS *Bulletin*— and his 1969 *Monthly* article on formal power series. He received the Lester R. Ford Award for the latter paper. Ivan viewed his most significant paper to be, "Uniform distribution of sequences of integers" (*Transactions* 1961), which started an entire theory.

Ivan wrote seven books, including the Carus Monograph *Irrational Numbers*, the New Mathematical Library publications *Numbers: Rational and Irrational* and *Mathematics of Choice/How to Count without Counting*, the MAA Dolciani Series publication on *Maxima and Minima Without Calculus, Diophantine Approximations*, (Interscience 1963), and the classic *text An Introduction to the Theory of Numbers* co-authored with Herbert S. Zuckerman. A fifth edition, co-authored with Hugh L. Montgomery, was published in 1991. His lean and lively 172-page book *Calculus: An Introductory Approach*, was published in 1961. Five of these books are still in print and collectively have been published in 11 different languages.

Throughout his career, Ivan was active in the wider mathematical community, especially within the Mathematical Association of America (MAA). He was elected First Vice President for the years 1974–1975, and he served as President in 1983–1984. He was a moderating in-

Niven continued on page 7

1999 Award Winners

Pacific Northwest

Ping-Tung Chang
Matanuska-Susitna College
University of Alaska, Anchorage

North Central

Ron Rietz
Gustavus Adolphus College

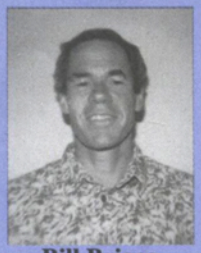
Wisconsin

Donald Passman
University of Wisconsin

Northern California

Leonard F. Klosinski
Santa Clara University

Rocky Mountain



Bill Briggs
University of Colorado at Denver

Iowa

Michael H. Millar
University of Nothern Iowa

Southern California

Arthur Benjamin
Harvey Mudd College

Kansas

A. Allan Riveland
Washburn University

Missouri

Rhonda McKee
Central Missouri State University

Southwestern

John W. Hagood
Northern Arizona University

Texas

Max Warshauer
Southwest Texas State University

Call for Nominations for 2000 Awards

Nominations for the Section Teaching Awards for 2000 should be submitted to the appropriate section officer in accordance with your section's procedures and deadlines. Nomination forms from section secretaries should reach department chairs and MAA liaisons by October 11. If your chair has not received the form by then, check with your section secretary or other appropriate section officer.

For Distinguished Teaching

Michigan

Kalpana A. Godbole
Michigan Technological University

Allegheny Mountain

Warren D. Hickman
Westminster College

Seaway

Gary Towsley
SUNY Geneseo

Northeastern

Charles I. Vinsonhaler
University of Connecticut

Metro NY

Joseph Malkevitch
York College (CUNY)

Indiana

James Caristi
Valparaiso University

Ohio

Zaven A. Karian
Denison University

EPaDel

Joanne Darken
Community College of Philadelphia

New Jersey

Amy Cohen
Rutgers, the State University of New Jersey

Kentucky

Paul E. Bland
Eastern Kentucky University

Md-Dc-Va

Ezra A. (Bud) Brown
Virginia Tech

Southeastern

Ben Klein
Davidson College

Oklahoma/Arkansas

William W. Durand
Henderson State University

Florida

Marcelle Bessman
Jacksonville University

The Moore Method: What Discovery Learning Is and How It works

Peter Renz

Some millions of years ago a creature with a stick solved the problem of what to eat for lunch by knocking fruit from a tree. At one stroke our ancestor demonstrated problem solving, tool use, and discovery learning.

Discovery Learning

The essentials of discovery learning are: Motivation, Discovery, and Presentation. Hunger, curiosity, and the delight of play supplied the Motivation for our primitive discoverer. Like our primitive ancestor, today's students will make their discoveries, without our having to tell them how they should do this. Presentation? Today students may give their results orally, in writing, or over the Internet, but the idea predates recorded history.

R. L. Moore developed his approach to discovery learning from 1920 to 1969 at the University of Texas. Known as "the Moore Method," his approach was based on lists of axioms, questions to resolve, and results to prove. These sequences challenged students and led them to discover the essentials of the subject. The idea is simple and astonishingly effective. Yet success is critically dependent on the way the class is run, not simply on the theorem sequences.

Moore on Video

To see how this method works, you can watch Moore himself in *Challenge in the Classroom*, a video available from the MAA. To read about the method, look at Chapter 12, "How to Teach," in Paul R. Halmos's autobiography, *I Want To Be A Mathematician*, also from the MAA, or see Halmos's article, "The Problem of Learning to Teach: The Teaching of Problem Solving" from the *American Mathematical Monthly*, May 1975. Another good source is the material on the R. L. Moore Legacy web site at the University of Texas (www.discovery.utexas.edu). I also recommend Keith Devlin's "Devlin's Angle" columns on the MAA website (www.maa.org) for May and June 1999 as a nice source of information about R. L. Moore and his teaching.

The Motivation in Moore's system was provided partly by the student's curiosity and sense of intellectual play. Good-natured competition was also a motivation. Capping everything for Moore's students was his great respect for them and for their ideas. This led to a sense of common intellectual striving that served his students well in their careers.

Robert Lee Moore at his desk in 1935

Martin Ettlinger, who took an MA with Moore before going on to graduate study at Harvard and a distinguished career as a plant products chemist, recently described the atmosphere in Moore's classes as extraordinary. Every student's ideas were listened to carefully and critically. No sniping or discourtesy was tolerated, but every idea was tested before being accepted. Ettlinger said the only other place he encountered this atmosphere was as a Junior Fellow of Harvard's Society of Fellows.

The Discovery in Moore's classes took place mainly outside the classroom, while Presentation lay at the heart of the classroom experience. Moore would ask one of the students whether he or she could present the next item at the board. If the answer was "Yes, sir," the student became the lecturer. Fellow students formed an interested and critical audience. The experience of seeing your dream proof collapse under careful examination by your fellows might be chastening, but the success of a difficult matter disposed of nicely was gratifying.

Moore's Students

Moore's students learned why one needs to check one's own work carefully, and they learned to present their results clearly. They did this for themselves and their fellow students, not simply to please their teacher. Moore used Presentation as a tool to build students' abilities to monitor and improve their own work and to give them the confidence to stand up and present their ideas. These qualities are essential in all walks of life. Moore used careful hints to edge the class forward over difficult material.

He would call on students who had contributed least first, to give them a chance to make a contribution. Moore never missed a chance to praise students for their accomplishments, directly or through others. He actively recruited able students and worked tirelessly to bring out the best in all of his students. All these things and more were part of his art, but the idea behind his method is simple and as applicable now as ever:

Motivate what is to be done. Let the students Discover how to do it. Have the students Present their results in good order before a critical but friendly audience.

Moore was a leader in research and teaching. He and his colleagues H. J. Ettlinger and H. S. Wall directed the work of 139 Ph.D. students. Many of the 50 who earned their degrees with Moore were prolific researchers and teachers including: R. D. Anderson, R H Bing, E. E. Moise, M. E. Rudin, G. H. Whyburn, R. L. Wilder. There have been 1034 Ph.D. descendants of the Moore line to date, according to W. T. Mahavier's web site (http://math.nich.edu/ted/tree/html).

The Moore method was spread by descendants of the Texas School and picked up by others. John Milnor has praised the Moore-method topology course that he took at Princeton; his instructor, Ralph Fox was not a descendant of the Texas School.

Texas topologists have made great contributions in areas ranging from the topology of arcs and continuua to infinite dimensional spaces and beyond. Though there were no Moore descendants at hand when I was in graduate school, my work on the contractibility of the homomor-

Moore continued on page 8

continued from page 3

fluence, fiscally conservative, and careful about committing MAA's resources to new ventures.

Association Activities

Besides holding major offices in the MAA, Ivan served on numerous AMS (American Mathematical Society) and MAA committees. He was a Member-at-Large of the Council of the AMS from 1966 to 1968 and served on at least eight other AMS committees. He also served on at least thirty MAA committees. He was a valuable member of all of them, but his greatest contributions were on committees concerned with the publications of books, especially the New Mathematical Library series on which he worked with Anneli Lax for nearly thirty years.

In 1989 he was presented the MAA's highest award for achievement, the Award for Distinguished Service to Mathematics. Ivan was also active in the MAA at the local level and served as Governor of the Pacific Northwest Section from 1955 to 1958 and again from 1979 to 1982.

Ivan especially enjoyed classical music and was a supporter of the Eugene Symphony, the Mozart Players, and the Chamber Music Society. He was also an avid reader and for a long period, before ill health prevented it, he went salmon fishing regularly on charter boats out of Winchester Bay. Swimming was his sport, and he swam daily as long as his health allowed.

Throughout his career, Ivan was the ultimate gentleman and consummate diplomat. In every situation he was thoughtful and wise, and he always gave more than he received. He made many significant and lasting contributions to mathematics, and he performed his many tasks in an exemplary way earning him the highest respect of the entire mathematical community. ■

References

"Award for Distinguished Service to Ivan Niven," by Kenneth Ross, *American Mathematical Monthly* 96 (1989), 3–4.

"A Conversation with Ivan Niven," by Donald J. Albers and G. L. Alexanderson, *College Mathematics Journal* 22 (1991), 371-402.

Moore

continued from page 6

phism group of the Hilbert cube took off from ideas of a Moore descendant, Raymond Y. T. Wong. The Texas school remains a pervasive and productive force.

What is surprising is that Moore's teaching methods have not been more widely studied and used. This may be changing with increased emphasis on student discovery methods. People outside the Moore tradition are beginning to experiment with what the method can do today.

The Modified Moore Method: Inquiry-Based Learning in Mathematics Today

Anyone who has written a thesis understands the demands and rewards of inquiry-based learning. The creative struggle of problem solving and the need to tie things down clearly for others were central to Moore's method of teaching as well—as was the sort of mentoring relationship that a student might have with her Ph.D. advisor. Graduate school provides models for modified Moore-method teaching that we can all recognize.

Students learn to crawl, then walk, then run. Most classes contain some discovery elements, be they challenge problems or projects for individuals or groups. There are many possibilities for inquiry-based learning. The goal is to enable your students to learn more by discovering more for themselves. Michael Martin of Denver University commented that the inquiry-based courses described here provide good background for undergraduate seminars or journal study programs.

John Neuberger of the University of North Texas teaches an analysis course today whose content and teaching style follow lines completely familiar to Moore. But when John teaches numerical analysis or differential equations, he adapts Moore's methods to a world where examples may be worked by students using computers. Here the adaptations concern the content of the course and the tools the students use. You might ask your students to work in teams, each team making its own report. This would be a further modification of the Moore method. For information about John's approaches you may e-mail him (jwn@unt.edu).

The April, 1999 conference at the University of Texas, Austin, on the legacy of R. L. Moore had a session that suggested the range of Moore method courses today. Margaret Symington spoke about the two very different courses she was teaching. We heard from three students: the first was taking Symington's geometry course for future teachers, the second was taking a topology course from the Symington course plus a Moore-method course taught by Haskell Rosenthal on analysis, and the third had taken the topology course the previous semester when it was taught by Michael Starbird, who chaired the session.

Starbird's topology notes formed the basis for the Moore-style topology course Symington was teaching. It is noteworthy that Symington and Rosenthal were not raised in the Moore tradition. They are converts attracted to the method for its teaching power, and these were the first Moore-style courses they had taught.

The previous summer Symington had attended an NSF-funded workshop given by David Henderson on innovative discovery methods for teaching geometry. This workshop was the basis for Symington's course aimed at future teachers. Henderson was a student of R H Bing, who took his doctorate with Moore. Yet Henderson's approach emphasizes geometric intuition rather than axioms. He presents students with geometric situations they can explore and analyze. For example, if you are putting tape onto a curved surface such as a cone or sphere what sorts of paths does it follow?

Everybody who has bandaged a finger knows that there is something interesting here. The students then develop a mathematical description of what is going on and why.

For more information check Henderson's web page (http://math.cornell.edu/~dwh) or e-mail him (dwh@math.cornell.edu). For written material see his two texts, *Experiencing Geometry on Plane* and *Sphere and Differential Geometry: A Geometric Introduction*. Information on Symington's course can be found at http://rene.ma.utexas.edu/users/msyming/geometry/M333L-info.html.

Rosenthal's course was aimed at building a basic understanding of ideas about function spaces. He has been writing up his notes, a large job with much still to be done. Rosenthal commented later: [These notes] already contain quite a bit of material, more in depth than breadth." Depth of coverage is a strength of the method. Breadth can be achieved by writing up more material than would be covered in any one class and varying the areas covered from class to class, this will allow students who have the notes to cover other areas on their own, something the method trains them to do.

What I learned at the April conference and from exchanges with Henderson, Neuberger, Symington, and others is that there are many approaches to the Moore method and that there are materials being developed to help others begin to use the method and adapt it to their needs. Moreover, this work is being taken up by people outside of the Moore tradition who see the method as offering solutions to current problems.

Teachers such as Judy Kennedy at the University of Delaware see Moore-style courses as ideal as introduction to rigorous independent thinking and the use of proofs. These transition courses are becoming common at the junior level. At the University of Texas, Austin the department has asked Michael Starbird to develop such a transition course in number theory for use in Fall of 1999.

Starbird is doing this in collaboration with Edward Burger of Williams College. What is notable about the Burger/Starbird effort is that they plan to provide a full set of supporting materials so that teachers unfamiliar with the Moore method can teach this course. For information about this contact Starbird at starbird@mail.utexas.edu.

Inquiry-based learning is basic in education. We have all experienced it and all teachers use it, to a degree. Is it reasonable to hope that every mathematics department might offer its students at least one modified Moore method course? Given what the method has achieved, I would hope so. ■

ARUME Forms Committees to Guide Its Development and Activities

Ed Dubinsky

The Association for Research in Undergraduate Mathematics Education (ARUME) was formed at the January 1999 meeting in San Antonio. About 120 people signed up for membership and this number rose to about 150 shortly after the meeting. The organization began with approval of a preliminary set of bylaws and the election of officers. Ed Dubinsky will be coordinator until January 2000 when Annie Selden will take over. A listserv of all members was formed and so far it has only been used for communication. In April, the MAA received a small grant from the Exxon Education Foundation to support the activities of ARUME.

Using the listserv in January and February, the organization decided on and formed six committees: Bylaws, Guidelines, Mentoring, Newsletter, Literature, and Web Site. The Guidelines Committee is charged with developing guidelines for mathematics departments that have hired mathematics education faculty. It is also providing suggestions to the more general MAA Committee on Guidelines. The Mentoring Committee is working with mathematicians who want to develop a background in mathematics education and begin to do research in that area. The Newsletter Committee is working out the nature of an ARUME Newsletter and putting out the first issue which will be a biography of the members of the ARUME Executive Board. A preliminary version of this issue is expected to be available by the end of the summer. The committee is looking for a permanent editor and volunteers are welcome. The Literature Committee is constructing, and will maintain on the Web, an annotated bibliography of research in undergraduate mathematics education with periodic updating. The purpose of this is to provide a tool for researchers that makes up for the fact, which we hope will change in the not too distant future, that there is no central reviewing activity in our field. The Web Site Committee is constructing an ARUME web site that will include, amongst other things, the bibliography.

People who are interested in becoming involved in ARUME should contact Ed Dubinsky (edd@cs.gsu.edu) or David Meel (DMeel@aol.com). Membership is open to all members of the MAA and, at the present time, there are no dues. The MAA is seriously considering the formation of a structure of special interest groups. If this comes about, ARUME may become one of these groups and it is possible that nominal dues will be set.

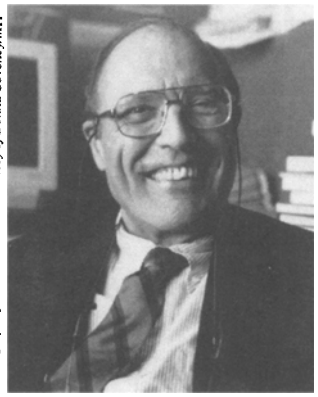
Gian-Carlo Rota Remembered

Peter Renz

Gian-Carlo Rota died in his sleep of an apparent heart attack April 19, 1999 at the age of 66. We can't know what further contributions he might have made to culture and mathematics, but we can be thankful for what he gave us in his lifetime. For those who do not yet know him or what he has written, now is a good time to make your acquaintance through his writing.

Pick up one of his books of essays such as *Discrete Thoughts or Indiscrete Thoughts*, its successor, or browse copies of *Advances in Mathematics*, one of the journals Gian-Carlo launched and ran. His witty and incisive book reviews are specially recommended; they give a sense of his range and style.

My introduction to Rota came as a graduate student, reading "On the Foundations of Combinatorial Theory, I" from *Zeitschrift für Warscheinlichkeitstheory* (2 [1964], pp. 340-368). This paper on Mobius inversion began a revolution, an effort by which Rota "almost singlehandedly lifted combinatorics from barely respectable obscurity to one of the most active fields in mathematics today," in the words of his MIT colleague Richard Stanley. This paper shows Rota's ability to bring life, freshness, and beauty to what he touched. In the same spirit, see his 1997 book *Introduction to Geometric Probability*, written with Daniel A. Klain.



Photograph of Gian-Carlo Rota courtesy of Donna Coveney/MIT

Gian-Carlo Rota was professor of philosophy and Norbert Wiener Professor of Mathematics at MIT. Among many other honors he was elected to the National Academy of Sciences in 1982. He died April 19, 1999.

Honors he had, but honors can not give the full measure of this man. We can count his 35 Ph.D. students, but not the host of others whom he inspired. The packed auditorium at his memorial at MIT and the praise and remembrances of students and family members would give you a sense of Gian-Carlo. He was more than a mathematician and philosopher. He was a friend and supporter of others. At the end of his memorial a student recalled the warmth of Rota's hugs when they met.

Rota's smile conveyed his warmth and enthusiasm. He saw the good in a subject or in a person and made this manifest. This gift was part of what made him a great teacher and a productive mathematician. He will be with us in many ways for a long time to come. Dick Stanley has assembled some useful links at www3-math.mit.edu/~rstan/rota.html. In his spirit let us celebrate what we have, not mourn what we missed. ■

Angus E. Taylor, Influential Author and Judicious Administrator, Dead at 87

Gerald L. Alexanderson

The Association lost a distinguished longtime member on April 6, Angus Ellis Taylor, who died of cancer in Berkeley, California after an outstanding career as a mathematician and academic administrator.

Clark Kerr, president of the University of California, wrote that Taylor's judgment and manner made him "one of the giants in the history of the Academic Senate" at that statewide institution.

To those in the mathematical community Taylor will probably be best remembered as the author of texts from which a generation or two learned functional analysis. His key texts were *Elementary Differential Equations* (1945), *Advanced Calculus* (1955), *Introduction to Functional Analysis* (1958), and *General Theory of Functions and Integration* (1965). An earlier calculus text, coauthored with G.E.F. Sherwood, was published in 1942 and was popular for many years, as was his *Calculus with Analytic Geometry* (1959).

Taylor served the MAA in the 1950s and 1960s as the MAA representative on the Committee on the Employment Register and the Joint Committee on Employment Opportunities. He contributed to the Monthly and spoke at MAA section meetings—including a memorable survey he gave of the history of point set topology in abstract spaces at a Northern California Section meeting in Monterey in 1980. Between 1964 and 1966 he served on the Council of the AMS. He also served on the national board of governors of Pi Mu Epsilon.

Taylor was born in Craig, Colorado, October 13, 1911, and received his bachelor's degree summa cum laude at Harvard in 1933, his doctorate at Caltech in 1936. At UCLA he rose through the ranks from instructor to professor between 1938 and 1947. In 1937-38 he was an NRC fellow at Princeton and in 1955 he was a Fulbright research fellow at Mainz.

Between 1958 and 1964 Taylor served as chair of the mathematics department at UCLA. In 1965 President Clark Kerr of the University of California appointed Professor Taylor Vice President of Academic Affairs, a position he held for a decade. These were difficult years at the University of California.

He was given major assignments as peacemaker during the Free Speech Movement days at Berkeley and during the crises surrounding the appointments of Eldridge Cleaver and Angela Davis. In 1975 he was named University Provost, the highest ranking academic officer in the statewide system. From there he went on to become chancellor at the University of California, Santa Cruz, a position he held at the time of his retirement.

He is survived by two sons, a daughter and six grandchildren. ■

Letter to the Editor:

The current MAA mission statement is much better than the proposed one—in several important ways—not the least of which is that the proposed one sounds like the typical product of a committee—and one not of one mind.

The current MAA mission statement has its irritating flaws: "To advance the mathematical sciences, especially at the collegiate level"—" advance" being either too general or tending to emphasize research; and (2) just what is the meaning of "mathematical sciences"? Isn't it, and hasn't it for centuries been, adequately and rather precisely designated as mathematics? Nonetheless, the current mission statement does have Occam on its side.

As for the proposed mission statement, why is it first and foremost "To promote appreciation, understanding and enjoyment of mathematics, especially at the collegiate level?" I thought we were in this to promote mathematics. If one must embellish, by itemization with "communication," "teaching," "learning," "research" and "uses", then dedication to and restriction by these specifics are implied. While I'm certain there are many aspects not included in that list, aren't we interested also in teaching math to the uninterested?

Duncan Morrill
Lockheed Martin—Sanders
<Duncan.Morrill@ieee.org>

Math Forum Seeks Data on Education

The Math Forum is now collecting information on how mathematicians can be effectively involved in school education. See our page, *Mathematicians in Mathematics Education*, http://forum.swarthmore.edu/mathed/mime/.

Our purpose is to document and encourage productive involvement of mathematicians in K-12 education. The emphasis is on low (or no) budget involvement in the schools—special math days, working with students, working with teachers, lending expertise to schools and school systems, getting on and working on school boards, etc.

Please contribute descriptions of what you have done to the page's organizers,

Judy Roitman
<roitman@oberon.math.ukans.edu>
and Susan Addington
<susan@math.csusb.edu>. ■

Employment Opportunities

MINNESOTA

SOUTHWEST STATE UNIVERSITY
Mathematics

Southwest State University invites applications for a probationary full time Assistant/Associate Professor of Mathematics to begin on January 7, 2000 or a date to be negotiated. The faculty member will teach a full range of mathematics courses and participate in department and university activities, which may include curriculum development, program review, supervising University courses taught in regional high schools, and other outreach activities in both mathematics and mathematics education. A doctorate in mathematics or mathematics education is required. The applicant must have a strong commitment to teaching at the undergraduate level and to working with mathematics education students in addition to having excellent written and oral communication skills. Preference will be given to the applicant who is able to teach a broad range of courses in mathematics and mathematics education. Experience in computer science or computer use in teaching mathematics is desirable. Letter of application addressing position qualifications, vita, teaching evaluations, official transcripts and name, address, and phone numbers of three references should be submitted to: Office of Human Resources, Southwest State University, 1501 State Street, Marshall, MN 56258. Review of the applications will begin on September 1, 1999 will continue until position is filled. SOUTHWEST STATE UNIVERSITY IS AN EQUAL OPPORTUNITY EDUCATOR AND EMPLOYER. APPLICANTS MUST BE ABLE TO LAWFULLY ACCEPT EMPLOYMENT IN THE UNITED STATES.

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The University of Houston-Clear Lake School of Natural and Applied Sciences invites applications for a position in mathematics education beginning August, 1999. The position is, pending funding approval, a tenure-track position. The position requires a doctorate in mathematics education or a doctorate in mathematics with extensive experience teaching university mathematics education courses. Preference will be given to candidates with extensive public school teaching experience.

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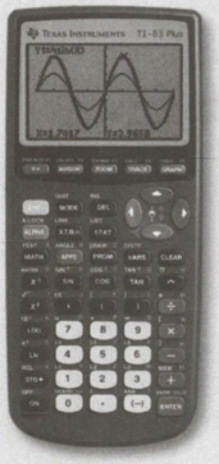
UHCL is an AA/EO institution.



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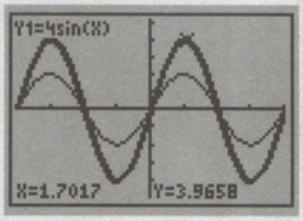

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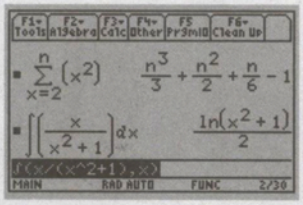

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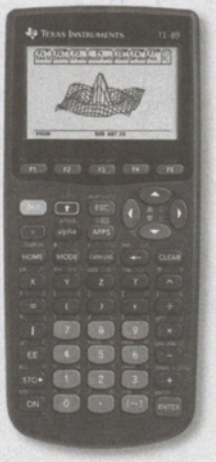

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