MAA Prizes Presented in Orlando

At the Joint Mathematics Meetings in Orlando in January, the Mathematical Association of America (MAA) presented a number of awards. Presented below are the citations for the awards.

Haimo Awards for Distinguished College or University Teaching

In 1991 the MAA instituted Awards for Distinguished College or University Teaching of Mathematics to honor college or university teachers who have been widely recognized as extraordinarily successful and whose teaching effectiveness has been shown to have had influence beyond their own institutions. In 1993 the MAA Board of Governors renamed the award to honor Deborah and Franklin Tepper Haimo. Deborah Tepper Haimo was president of the MAA (1991–1992).

Citation: Thomas F. Banchoff

Letters from former students stretching over a period of 30 years express their appreciation for Professor Banchoff's engaging and challenging teaching techniques in the most glowing terms. Typical examples include:

"I have never been a student in a more delightful or effective class in my life, and from my own teaching at Harvard and Stanford I know just what a gift it is to be able to do what Banchoff did."

"What a teacher! He certainly had a major impact on my life and was one of the reasons I finally decided to become a mathematician. It would be hard to find a candidate more deserving than Tom." (The writer is now professor of mathematics at Yale University.)

Professor Banchoff is always ready to discuss educational issues with his colleagues and graduate and undergraduate student teaching assistants. He is an author of a widely used MAA volume on the training of teachers. He has been involved in many of the innovations in mathematics teaching at Brown, from the Summer Transitional Program for Minority Students in the late 1960s to his course in the Fourth Dimension, begun under the rubric of the Modes of Thought program in the New Curriculum and now a permanently established course. He is best known for his work in computer graphics, in collaboration with computer science colleagues and student assistants, beginning with the award-winning film "The Hypercube: Projections and Slicing" and extending to his current projects in interactive computer laboratories for multi-variable calculus and differential geometry.

Although Professor Banchoff has spent the greatest part of his efforts with undergraduate students, he also has had six Ph.D. students who have gone on to college and university teaching. It is no surprise that three of them have won teaching awards at their own institutions and a fourth is working in a post-doctoral position at the Geometry Center at the University of Minnesota.

When two years ago President Vartan Gregorian of Brown University announced the creation of awards for teaching excellence at Brown University, Professor Banchoff became the first recipient of the Philip Bray Award for Teaching in Natural Sciences. His nomination for that award ended as follows: "If the term 'great' is reserved for the departed, as it should be, then the

term that best describes Thomas Banchoff is 'Master Teacher'." This accolade, together with the long list of successes achieved by Professor Banchoff in his superb teaching, makes him an exceptionally strong candidate for the Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics. It is a great pleasure to be able to pay tribute to his extraordinary teaching success in this way.

Citation: Edward M. Landesman

Professor Landesman's effectiveness as a teacher encompasses the full mathematics curriculum, from calculus and linear algebra to real and complex analysis, as well as all types of classroom situations—large classes held in lectures to small advanced seminars. Whenever he teaches in the core courses required or encouraged of majors, enrollments surge. Students often put off taking a course until he teaches it. His teaching evaluations provide incontrovertible proof of the esteem students have for his teaching: ninety-five percent invariably rate him excellent.

His classes are incredibly well prepared. He is constantly finding new and better ways of presenting the material, and during his office hours his office is swarming with students, indicating a very welcoming attitude toward them. Many of his undergraduate students have gone on to earn Ph.D.s in mathematics, and he has supervised as many Ph.D. students as anyone else in his department. With these students he creates a close personal relationship, and they continue to turn to him for advice and tell of their successes.

His contributions to mathematics education extend far beyond the classroom in a variety of ways and media, all of which have gained significant notice through professional articles or newspaper features: He has, since its inception, been co-director of the Monterey Bay Area Mathematics Project, through which he has helped over 200 pre-college teachers to upgrade their mathematics and instructional skills; he has written a linear algebra textbook; and, as a pioneer in the use of media in technology for teaching mathematics, [he has] produced many high-quality videotapes for precalculus and interactive videodisk modules for learning mathematics. Recently he has started an honors mathematics high school in Santa Cruz County.

As one of his students, now a college teacher of mathematics, put it: "I can't emphasize enough the significant role Ed has played in shaping both my mathematics and teaching careers. Ed's successes as a teacher of mathematics are reflected in his popularity among undergraduate and graduate students and serve as a model and inspiration to me in my own teaching. It is with the utmost respect and admiration that I reflect upon Ed's teaching and acknowledge how fortunate I was to be instructed by the greatest teacher I have ever known."

By both his example and his advocacy of the need to improve instruction, Professor Landesman sets the standard for teaching to which the rest of his department aspires. He has mentored junior faculty. He has more to offer than nuts and bolts advice: he is also acquainted with recent research on everything from epistemology to cognitive science, whatever will be useful in helping students to grasp the beauty and power of mathematics. For this, he has won numerous awards, including the 1984 UCSC Alumni Association's Distinguished Teacher of the Year Award and was one of three awardees (from over 100 nominations, the only one in mathematics) of a 1987 Excellence in Teaching Award from the Northern California Phi Beta Kappa honor society. It is, therefore, only fitting that the MAA joins the many organizations that have previously recognized Professor Landesman's outstanding accomplishments by awarding him the Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics. It is a great pleasure to be able to do so.

Citation: Herbert S. Wilf

Professor Wilf has been considered one of his department's master teachers ever since he started at the University of Pennsylvania in the 1960s. In the course evaluations' standard questions "rate the teacher on a scale from 0-4" his rating has never been below 3.5, and scores of 3.9 and even higher are plentiful. Students' comments are always glowing. The following are typical ones from his calculus courses:

"Wilf is God. He is a great teacher, he is very accessible and helpful, and he makes a nasty course seem straightforward. …" "Professor Wilf is great. He is generally concerned that we learn what's going on; I did not miss one class! I learned a lot from him. …" "Dr. Wilf gives understanding and insight into the seemingly inexplicable."

A typical comment from his combinatorics class: "Before I took his class, combinatorics was just one branch of mathematics; now thanks to Dr. Wilf, I see combinatorics as something that is theoretically sound, intellectually challenging and interesting at the same time. I am very glad that I took this class; not only have I learned a lot, but also I enjoyed every single lecture and gained a new perspective on the subject."

Similar comments from other students illustrate the effectiveness of his teaching style, his concern that students understand clearly everything that is going on in class, his dedication to the students as evidenced by his outside-of-class availability, and the innovative nature of

the curricula he presents—students often refer to the fact that they are excited to be using current mathematics literature and working on projects that involve unsolved problems.

Twenty people have the distinction of having had Professor Wilf as their Ph.D. thesis advisor. He has been unusually successful in attracting students to the field of combinatorics, and his students have been unusually successful completing their Ph.D.s. As one of his Ph.D. students wrote: "Many academics feel grateful and even devoted to their Ph.D. supervisor. I hope to convey reasons why my praise goes beyond such emotions because of Professor Wilf's distinction and excellence as a teacher, scholar, and person. …

"Professor Wilf has done more than lecture clearly and enthusiastically and contribute substantially to research in the field of combinatorics. He really shaped it by exploring algorithmic aspects of this discrete subject and so forged an important connection with theoretical computer science as that field was also developing. But for his graduate students and many undergraduates, Professor Wilf did even more. He listened and advised about suitable research problems, but then he left us to find our own way in this first research endeavor …"

Professor Wilf has written extensively for students of mathematics and for teachers of mathematics. His (at least) seven books on subjects ranging from calculus to algorithms to generating functions to FORTRAN are models of clear and effective writing. As one of his former graduate students put it, "Professor Wilf writes as well as he speaks."

This certainly does not exhaust the list of activities in which Professor Wilf has been a champion of good mathematics and of the effective communication of good mathematics. In over 120 publications ranging from books to essays to research articles, he has inspired several generations of mathematical scholars and students in other disciplines as well. His unusual success as an effective communicator of good mathematics clearly qualifies him superbly for a Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics. It is a great pleasure to be able to honor him by conferring this award upon him.

Educom Medal

The Educom Medal was established in 1994 to assist in improving "the quality of the undergraduate learning experience and to promote the effective use of information technology in higher education." Educom works with professional societies, this year with the MAA, identifying people who have "addressed a significant pedagogical problem fundamental to the discipline, provided an innovative solution offering clear advantages over other techniques, and demonstrated substantial impact on improved student learning." The recipient this year was chosen by the MAA's Committee on External Awards (Kenneth M. Hoffman, Donald L. Kreider (chair), and David A. Sanchez).

Citation: David A. Smith

David A. Smith has dedicated his professional life to his students, to mathematics, and to a vision of dramatically improving mathematics education through the use of computers and emerging technologies. For him it has been more than a vision. He has prodigious energy, and his sustained effort in academic computing has influenced many of his colleagues and associates across the country to follow his lead.

David was an early pioneer in the field of academic computing. He was mathematics editor for *CONDUIT* during the 1980s. He has served as associate editor for *Mathematics Magazine* and *The College Mathematics Journal* and as software reviews editor for *UME Trends*. He provided strong leadership as chair of the MAA's Committee on Computers in Mathematics Education and has served on the advisory committee of the Interactive Mathematics Text Project, which was strongly influenced by his work.

David is, perhaps, best known for Project CALC, a program developed by him and L. C. Moore at Duke University. Project CALC, which covers three semesters of calculus, was an early example that demonstrated to the mathematical community what calculus reform can be. Through numerous workshops and lectures on Project CALC, David encouraged faculty across the country to use the Project CALC materials and its philosophy. The primary innovation of Project CALC, David says, is seen in its title—Calculus As a Laboratory Course, not calculus with a lab. He was an early proponent of students discovering mathematics for themselves and becoming involved in doing mathematics through guidance and stimulation of well-structured labs. Writing became such an integral part of his students' work that Project CALC classes at Duke became part of the University's "Writing across the Curriculum" program. Few educational reform efforts have been so carefully evaluated as has Project CALC. From the beginning, the project has been evaluated in many ways by Jack Bookman, a Duke faculty member with a Ph.D. in mathematics education and a specialist in evaluation. This careful and thorough evaluation has become a model for other calculus reform efforts.

David has received many grants and awards for his work and has directed several NSF grants devoted to computing in the curriculum. In 1991 he received, with L. C. Moore, Educom's Award

for Best Curriculum Innovation in Mathematics. It is no surprise to anyone involved in recent mathematics reform efforts that David has been selected as recipient of Educom's newest and most prestigious award, the Educom Medal. Recipients of this award must have addressed a significant pedagogical problem fundamental to the discipline, must have provided an innovative solution offering clear advantages over other techniques, and must have demonstrated substantial impact on improved student learning.

David was an ideal candidate for the nomination committee that recommended him to Educom. His lifelong work in mathematics and academic computing, the stimulation that he has provided to his peers, and his supreme dedication to his students and to excellence have sharpened the meaning of the Educom Medal's stated requirements. Educom and the Mathematical Association of America are proud to be able to honor David Smith through the award of the Educom Medal.

Beckenbach Book Prize

The Beckenbach Book Prize, established in 1986, is the successor to the MAA Book Prize. It is named for the late Edwin Beckenbach, a long-time leader in the MAA publications program and a well-known professor of mathematics at the University of California at Los Angeles. The prize is awarded for distinguished, innovative books published by the MAA.

Citation: Constance Reid

Most mathematicians are acquainted with the work of Eric Temple Bell. A number theorist and president of the Mathematical Association of America, he was also the author of popular expositions of mathematics and of entertaining, if sometimes fanciful, accounts of its history. Constance Reid's *The Search for E. T. Bell* introduces us to the man behind these accomplishments. Part biography and part detective story, Reid's book unravels the mystery of Bell's early years and leads us through his prodigious nonmathematical works, including epic poetry and science fiction published under the pseudonym John Taine. Reid summarizes Bell's research in number theory with the clarity that typifies her approach to mathematical biography, and her description of the influences on his mathematical development contributes valuable details to our understanding of the history of American mathematics.

The Search for E. T. Bell is a fascinating, informative, and readable account of an enigmatic mathematical personality. With her investigation of the human side of E. T. Bell, Constance Reid has once again performed a great service for the mathematical community. This outstanding book fully deserves its place among recipients of the Beckenbach Book Prize.

Chauvenet Prize

The Chauvenet Prize for expository writing, first awarded in 1925 to Gilbert Bliss of the University of Chicago, is given for an outstanding expository article on a mathematical topic by an MAA member. The prize is named for William Chauvenet, a professor of mathematics at the United States Naval Academy. It was established through a gift in 1925 from J. L. Coolidge, then MAA president.

Citation: Joan S. Birman

The 1995 Chauvenet Prize is awarded to Joan Birman for her article "New points of view in knot theory", which appeared in the *Bulletin of the AMS*, **28** (April 1993), pages 253–287. This marvelous article does everything one might want an expository account of a subject to do.

It is all of these, at the same time:

• It is an article that one can give to a student who is just about to take a first course in knot theory. Birman sets down vividly, precisely, and agreeably the basic definitions, aims, intuitions, examples in the theory. Her article even provides at one point a sketch, readable by any student, of a proof of an important foundational matter which cannot be found elsewhere.

• Birman's article conveys the marvelously Protean nature of the subject matter and of its history—including a sympathetic recollection of important ideas occurring in the early papers of Alexander, a discussion of the efforts of classification of knots in the nineteenth century by the physicist P. G. Tait and others, as well as the more recent startling connection to von Neumann algebras which are factors of type II stemming from the work of Vaughan Jones.

• As announced by its title, her article describes the "new points of view". Someone who had no inkling of these new developments, e.g., of

the HOMFLY polynomial,

the Kauffman polynomial,

the quantum group invariants—alias "generalized Jones invariants",

the ideas of Arnold and Vassiliev on the "moduli space" of all knots—including degenerate ones—and the "Vassiliev invariants" that one can deduce from the study of this "moduli space",

and the connections between these collections of new invariants

can get a clean explanation of parts of this exciting work, including a sense of the swarm of open problems that remain, from Birman's article.

The instructions for the Selection Committee say that "preference should be given to papers

that come within the range of profitable reading for members of the Association." Birman's article is particularly appropriate in this regard. It provides something for everyone and does so with clarity and spirit.

Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics

The Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics is the most prestigious award made by the MAA. This award, first given in 1990, is the successor to the Award for Distinguished Service to Mathematics, awarded since 1962, and has been made possible by the late Dr. Hu and his wife, Yueh-Gin Gung. It is worth noting that Dr. Hu was not a mathematician. He was a retired professor of geology at the University of Maryland. He had such strong feelings about the basic nature of mathematics and its importance in all human endeavors that he felt impelled to contribute generously to our discipline.

Citation: Andrew Gleason

Andrew Gleason was born in Fresno, California, in 1921, received most of his schooling in Yonkers, New York, and went to Yale, where he was in the top five in the Putnam Competition for three years in a row. After four years of active and fortunately mathematical duty in the Navy, he became a Junior Fellow at Harvard in 1946. With some time out for further active duty during the Korean War, he has been at Harvard ever since, becoming a full professor in 1957. His wife, Jean Berko Gleason, is professor of psycholinguistics at Boston University; they have three daughters, Katherine, Pamela, and Cynthia.

In thinking about, and admiring, Andy Gleason's career, your natural reference is the total profession of a mathematician: designing and teaching courses, advising on education at all levels, doing research, consulting for the users of mathematics, acting as a leader of the profession, cultivating mathematical talent, and serving one's institution. Andy Gleason is that rare individual who has done all of these superbly.

His influence on mathematics education has covered over 40 years, and has been outstanding. He has been heavily involved in the thinking about mathematics education ever since the 1950s. A few examples: He was chairman of the Advisory Board to the School Mathematics Study Group; he organized the Cambridge Conference on School Mathematics; and he was on the Advisory Board to USMES, the Unified Science and Mathematics program in the Elementary Schools. All of these, while controversial, were influential and thoughtful projects. He taught some elementary school math himself and pioneered reporting what didn't work as well as what did. He was the chief mathematical advisor to Houghton Mifflin and the Dolciani Series for many years and undertook many key tasks nationally, participating, for example, in the thinking that led to the establishment of the Mathematical Sciences Education Board. In recent years, Andy's "guiding hand", as Anneli and Peter Lax have described it, can be seen throughout Harvard Project Calculus. He has continued to be active in education since his 1992 retirement, working with the Massachusetts State Board of Education on curricular reform and with the Interactive Mathematics Project as a member of its Advisory Board.

The students at Harvard University, where Gleason was the Hollis Professor of Mathematics and Natural Philosophy, have been the beneficiary of many other curricular innovations besides Project Calculus. For example, he designed a second-year calculus experience truly integrated with linear algebra (the students took naturally to a rather abstract development) and developed Natural Sciences 1a (Euclid, Archimedes, and Newton, inter alia) as part of the Core Program at Harvard. Both of these show his strong sense of history in the teaching of mathematics and science.

His success in mathematical research has been outstanding. He was one of the major contributors to finishing the solution of Hilbert's 5th problem, and his research has had major influence in areas as apparently disparate as quantum mechanics and combinatorics. He has been known to explain that his strength is a thorough knowledge of the fundamentals, and he rarely, if ever, turns down a good problem. Gleason is a member of the National Academy of Sciences, a past president of the American Mathematical Society, and was both chairman of the organizing committee and president for the International Congress of Mathematicians at Berkeley in 1986. His mathematical tastes are very broad. Although he is classified as an abstract analyst, and this field encompasses the majority of his research papers, he has worked, and supervised dissertations, in many fields of both pure and applied mathematics. The one I remember best is the thesis in algebraic coding theory of Jessie MacWilliams, whom he helped to develop into one of the outstanding women mathematicians of our time. Many of his students agree that his quickness in thought and understanding make him a tough supervisor. He once characterized his main function in working with future Ph.D.s as giving them the opportunity to find out how good they are!

Gleason organized a group on coding theory, which met monthly for about ten years, and which included Ed Assmus, H. F. Mattson, Jr.,

John N. Pierce, Vera Pless, and Gene Prange among its "regulars". Gleason's interest in coding theory and cryptography extends beyond his own research, and that of a number of his students, to his consulting both for industry and for the nation's intelligence and security programs for over 50 years. He worked with both NSA and IDA and consulted at many levels. In summary, as David Lieberman has put it, "It has been inspiring to review and comprehend the role which he has played in shaping the science, the teaching, and the application of mathematics, both through his own contributions and through the many lives and careers he has so strongly influenced."

Certificates of Meritorious Service

The Certificates of Meritorious Service are presented for service to the MAA at the national level or for service to a section of the Association. The first such awards were made in 1984. At each January meeting of the Association, honorees from roughly six sections are recognized.

This year's honorees are: Marvin L. Brubaker, Eastern Pennsylvania and Delaware Section; Robert Bumcrot, Metropolitan New York Section; Sylvan Burgstahler, North Central Section; Donald W. Bushaw, Pacific Northwest Section; and Donald V. Meyer, Iowa Section.

—MAA