FOCUS on MAA

Celebrating a Century of Mathematics 1915–2015

MAA**100**
MATHEMATICAL ASSOCIATION OF AMERICA

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This stained-glass rendering of the MAA icosahedron is in the lobby of the Edgar H. Vaughn Building, named for the grandfather of James Vaughn, president of the Vaughn Foundation, a major contributor to the 1978 fund to purchase the building to serve as MAA headquarters. It is one of three adjacent historic buildings in Washington, D.C., that constitute the Dolciani Mathematical Center, named in honor of mathematician, educator, and author Mary P. Dolciani Halloran, who provided significant funding for the purchase and subsequent renovation of the buildings.

A Time to Celebrate | Francis Edward Su, MAA President

For a century now, the Mathematical Association of America has been holding the banner high for mathematics at the collegiate level. As we anticipate the second century of our association and think about the opportunities it may bring, it is helpful to see that the core values that inspire our members are the same as the ones that launched the MAA.

The MAA was born in 1915 out of a desire to support the fledgling journal the *American Mathematical Monthly* as well as the mathematical interests it represented. There was a sense that accessible college-level mathematics in the gap between high school and research-level mathematics was not receiving any organized attention.

Monthly editor Herbert E. Slaught described the situation in the October 1915 issue: "No society is concerned particularly with this field and no journal represents its interests, except in so far as a few individuals have endeavored to do so in connection with *The American Mathematical Monthly*." Yet, as he noted, most faculty devote themselves largely (if not exclusively) to teaching, and there are many "who might be desirous of engaging in mathematical activities, either in the beginnings of research or by contributing to the betterment of teaching" yet find research communities inaccessible.

Slaught requested support from the American Mathematical Society. In an April 1915 resolution, the council of the AMS determined it was "unwise" to enter into the "special field now covered by the *American Mathematical Monthly*" since the society's focus was on research. But the resolution also said: "The Council desires to express its realization of the importance of the work in this field and its value to mathematical science, and to say that should an organization be formed to deal specifically with this work, the Society would entertain toward such an organization only feelings of hearty good will and encouragement."

After floating the idea of a new organization and receiving hundreds of messages of support from across the country, Slaught called for a meeting in December 1915, at which the MAA was officially born. The motivation, as Slaught put it, was "a sincere desire to promote the course of mathematics in this country in all its many and varied aspects, and especially in that field that has been so greatly neglected—the field of collegiate mathematics."

One hundred years later, our organization is still involved in all the "many and varied aspects" of the mathematical landscape, especially collegiate mathematics. Just as the founders did, our members continue to partner with, and maintain memberships in, other organizations to accomplish our respective missions.

We continue to support vibrant mathematical communities who cherish discussions about collegiate teaching through our sections and SIGMAAs. We promote the joys of problem solving through the Putnam contest and the American Mathematics Competitions. We publish journals and books that promote high-quality exposition and accessible mathematics, and our *Monthly* continues to flourish as the most widely read math journal in the world.

We continue to cherish mathematical people and invest in them through programs like Project NExT and PREP and grants that encourage women and underrepresented groups to pursue mathematics. We support departments through projects like the newly updated CUPM curriculum guide, and provide leadership to address national calls for improving undergraduate mathematics education through projects like Common Vision. And we continue to value mathematical culture and communication, as our many members use their artistic and creative gifts to bring mathematics to greater public awareness.

We remain true to our heritage. In this booklet, we've assembled a sampling of some highlights of the 100 years of our association. We value your contributions and continued support to advance collegiate mathematics into the next century. Thank you for being part of this community. Come celebrate with us this August at the centennial MAA MathFest!

Above: Francis Edward Su speaking at the Joint Mathematics Meetings, 2013.

"The record shows that 104 men and women, meeting on December 30 and 31, 1915, in room 101 of Page Hall on the campus of Ohio State University, formed a new organization which they named the Mathematical Association of America. They elected officers as follows: President, E. R. Hedrick of the University of Missouri; Vice-Presidents, E. V. Huntington and G. A. Miller of Harvard and Illinois; and Secretary-Treasurer, W. D. Cairns of Oberlin."
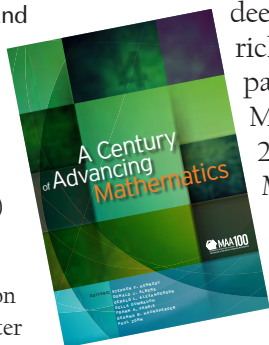—G. Baley Price, *American Mathematical Monthly* (1993)

AND TODAY

"The issues before the Association in the days before and shortly after its founding do not sound much different from many of the issues today. Should a course in mathematics be required for graduation? Should calculus be taught in the freshman year? . . . Should the United States go on the metric system? Should the same course be taught to future mathematicians and scientists as to other students? Should separate courses in different areas be taught, or should they be replaced by an integrated course? Committees were formed to study these questions and reports were duly submitted and distributed." —Gerald L. Alexanderson, MAA President 1997–98 (1990)

More MAA History

In the few pages of this *MAA FOCUS* commemorative booklet, we have had space to highlight only a handful of the many MAA efforts over the last century that have contributed to the advancement of mathematics and mathematics education.

One starting point for delving deeper into the organization's rich history is David E. Zitarelli's paper "The First 100 Years of the MAA," published in the January 2015 *American Mathematical Monthly* and in the MAA centennial volume *A Century of Advancing Mathematics.* The early history of the MAA is covered in some detail in the book *The Mathematical Association of America: Its First Fifty Years*, published in 1972 and now available in full on the MAA website.

To catch glimpses of history in the making, consult back issues of the *American Mathematical Monthly*, available online via JSTOR. Until 1982, every issue contained a section dealing with association matters. For more recent glimpses, check issues of the association newsletter *Focus* (later the newsmagazine *MAA FOCUS*). All issues, going back to the newsletter's debut in 1981, are now accessible on the MAA website.

Several MAA books have highlighted specific parts of association history. Of particular interest is *A Century of Mathematics: Through the Eyes of the* Monthly, edited by John H. Ewing and published in 1994 to commemorate the *Monthly*'s 100th anniversary.

For those who want to peruse the raw material of history, the Archives of American Mathematics, located in the Research and Collections division of the Dolph Briscoe Center for American History on the University of Texas at Austin campus, houses the preserved papers and records of the MAA.

Find out more about the MAA centennial celebration at *maa.org/100,* including historical articles about various aspects of the MAA, from history of the sections to interviews with selected MAA members.
—Ivars Peterson

1894
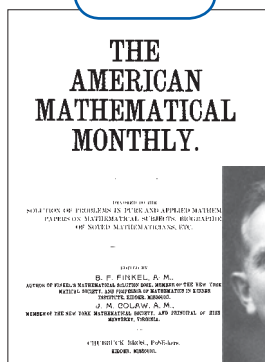
American Mathematical Monthly, *vol. 1, no. 1. Benjamin F. Finkel, founder and editor*

1914

Pi Mu Epsilon founded

1915

Mathematical Association of America founded. The charter members of the MAA— those who joined by April 1916—numbered 1,046. The largest number of members came from New York (120), followed by Illinois (97), Ohio (72), Massachusetts (70), and Pennsylvania (67).

1916

Earle Raymond Hedrick, first MAA president.

First MAA section: Ohio.

First summer meeting: MIT, September 1–2.

A SNAPSHOT OF LIFE IN 1915

- Twenty-eight PhDs in mathematics were awarded by 10 U.S. universities, led by Chicago with 11 and Harvard with five. Four of the 28 were awarded to women.

- The first-ever stop sign appeared in Detroit.

- Einstein's theory of general relativity was formulated.

- Woodrow Wilson became the first U.S. president to attend a World Series game; players on the winning Red Sox team each received $3,700.

- Most films were shown in nickelodeons, small storefront theaters that typically consisted of wooden chairs, a screen hung on the back wall, and a pianist to accompany the (silent) films.

- The average annual wage in the United States was $687 (equivalent to about $16,100 today).

- Only 1.5 percent of American high school students took a trigonometry course; 26.5 percent took a course in geometry.

- The Studebaker brothers, though manufacturing early automobiles, were still making horse-drawn vehicles.

- Mathematician Gaston Julia was shot in the face during a battle between French and German forces.

- The U.S. House rejected a proposal to give women the right to vote.

To see a list of 100 tidbits about 1915, collected by Deanna Haunsperger and Pamela Richardson, visit the MAA's website Celebrating the Centennial at *maa.org/100.*

MAA membership dues started out in 1916 at $3 for individuals, but were increased to $4 in 1920, to cover greatly increased journal printing costs.

"When I started paging the *Monthly* in 1963, the annual dues for individual members of the Association were $5; this included a subscription to the *Monthly*. From 1921 to 1957, the dues had been $4. This was such a long period of time that L. R. Ford, when he was president of the MAA in 1947, referred to Three Famous Mathematical Constants: *e*, pi, and, 4—the latter representing the annual dues. The dues increased to $5 in 1957."
—Raoul Hailpern, *Monthly* Production Manager 1963–86 (1993)

Two current MAA committees date back to the association's first year (1916): membership and publications. The first Committee on Publications consisted of H. E. Slaught (right), R. D. Carmichael, and W. H. Bussey, with Slaught as the managing editor of the *American Mathematical Monthly.*
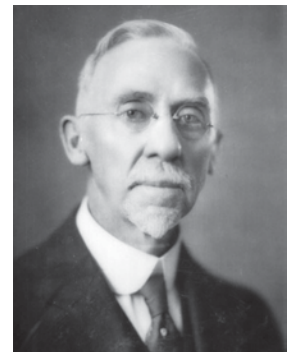
1918

Emmy Noether publishes a fundamental theorem used in theoretical physics and the calculus of variations.

1920

MAA incorporated in Illinois.

National Council of Teachers of Mathematics founded.

NCTM

1925

First Carus monograph published: Calculus of Variation *by G. A. Bliss.*

First MAA award: Chauvenet Prize for expository writing goes to G. A. Bliss.

1936

Alan Turing's "On Computable Numbers."

Gathering Places

MAA meetings have long provided opportunities for faculty to find new ideas for teaching their courses, for students to learn new mathematics, and for the general mathematical community to reconnect with friends and colleagues from around the world.

The practice of holding two national meetings a year goes back to the earliest days of the association, with a late December or early January annual (winter) meeting and a summer meeting, originally held at the beginning of September but later shifted to early August.

The first summer meeting occurred September 1–2, 1916, at the Massachusetts Institute of Technology. Attendees, for the first time, wore badges bearing name and institution as they shuttled between lectures in MIT's new buildings and accommodations at Harvard Yard dormitories.

The 1921 winter meeting was held in Toronto, emphasizing that, from the beginning, the "American" of the association's name included Canada. Like many of the early meetings of the MAA, it was held jointly with other societies, including in this case the American Mathematical Society, the American Association for the Advancement of Science, and the American Physical Society. The only year in which the winter meeting did not take place was 1942, when the demands of war precluded such a gathering.

Starting in 1952, one of the highlights of the summer meetings was the presentation of the Earle Raymond Hedrick Lectures, named for the first MAA president. They were established to promote mathematical exposition and were meant to be "accessible to a large fraction of those who teach college mathematics." Tibor Radó presented the inaugural set of three lectures, on "Derivatives and Jacobians."

MAA meetings offer opportunities for public recognition of individuals who have made significant contributions in service to the mathematical community, and for exemplary mathematical exposition.

The Chauvenet Prize, named for a mathematics professor at the U.S. Naval Academy, was established in 1925 through a gift from J. L. Coolidge, MAA president at the time. The award was for an outstanding expository article on a mathematical topic. In the early years, the winner had to be a member of the association and the prize was awarded every five years; it is now given annually with no membership requirement. The first award went to G. A. Bliss for the article "Algebraic Functions and Their Divisors," published in the *Annals of Mathematics.*

The Award for Distinguished Service to Mathematics was established in 1961 to honor individuals for outstanding contributions, other than research, to mathematics or mathematical education. It became the Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics in 1990. The first honoree, in 1962, was Mina S. Rees.

1938

First Putnam competition.
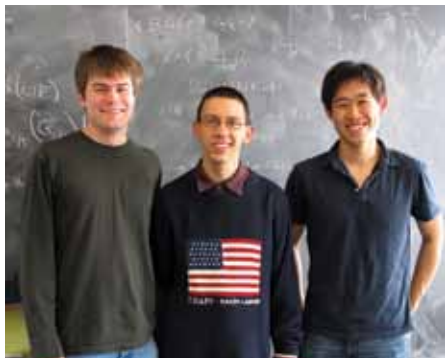
Harvard's 2013 winning team: Eric Larson, Evan O'Dorney, and Allen Yuan.

1939

Richard Feynman earns top-five ranking in second Putnam competition.

American Statistical Association centennial.

1940

*AMS and MAA partner in founding of* Mathematical Reviews.

1944

Theory of Games and Economic Behavior *by John von Neumann and Oskar Morgenstern.*

Albert Einstein delivered the Gibbs lecture on "An Elementary Proof of the Theorem Governing the Equivalence of Mass and Energy" at the 1934 winter meeting in Pittsburgh.

"I agreed to run for president because of my strong interest and involvement in MAA and because I wanted to expand the role of the membership on committees. At one point committee chairs picked their members. While I was president the committee chairs asked for nominations for the committees and for names of individuals who might like to serve." —Lida K. Barrett, MAA President 1989–90

MAA President Lynn Steen (far right) greets undergraduate math majors from Florida Agricultural and Mechanical University (FAMU) at the 1986 MAA meeting in New Orleans. Presenting the students is MAA Florida Section Governor Don Hill, professor of mathematics at FAMU.
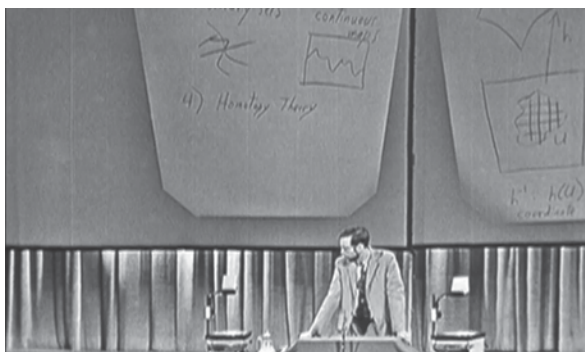
John W. Milnor delivered three lectures on "Differential Topology" at the 1965 summer meeting, held at Cornell University, as part of the celebration of MAA's 50th anniversary. His lectures were filmed and can be seen at *http://bit.ly/1FIcrHs*.

1945

CMS SMC

Canadian Mathematical Society founded.

1950

First year of MAA high school math competitions.

1951

siam

Society for Industrial and Applied Mathematics founded.
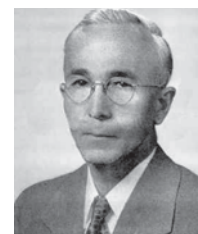
Lee Lorch and Evelyn Boyd ask the MAA to respond to racist incident against African-Americans at an MAA meeting in Nashville. MAA Board of Governors passes a resolution to conduct its affairs without discrimination as to race, creed, or color.

1952

*First Hedrick lectures, given by Tibor Radó.*

Committee on the Undergraduate Program [in Mathematics] formed.

Going Local

In his 1915 article describing the case for a new national organization, *Monthly* editor Herbert E. Slaught noted the need for "the formation of smaller groups" that would "provide a far-reaching stimulus to individual activity." He hoped to see "the college teachers of mathematics organized in every state, or even in some smaller groups."

True to Slaught's wishes, several state groups were already in existence even before the MAA was officially established at the end of 1915. As soon as the new association's constitution was approved, three states submitted formal applications to become sections: Kansas, Missouri, and Ohio. Ohio won the paperwork race to become the first section on March 1, 1916.
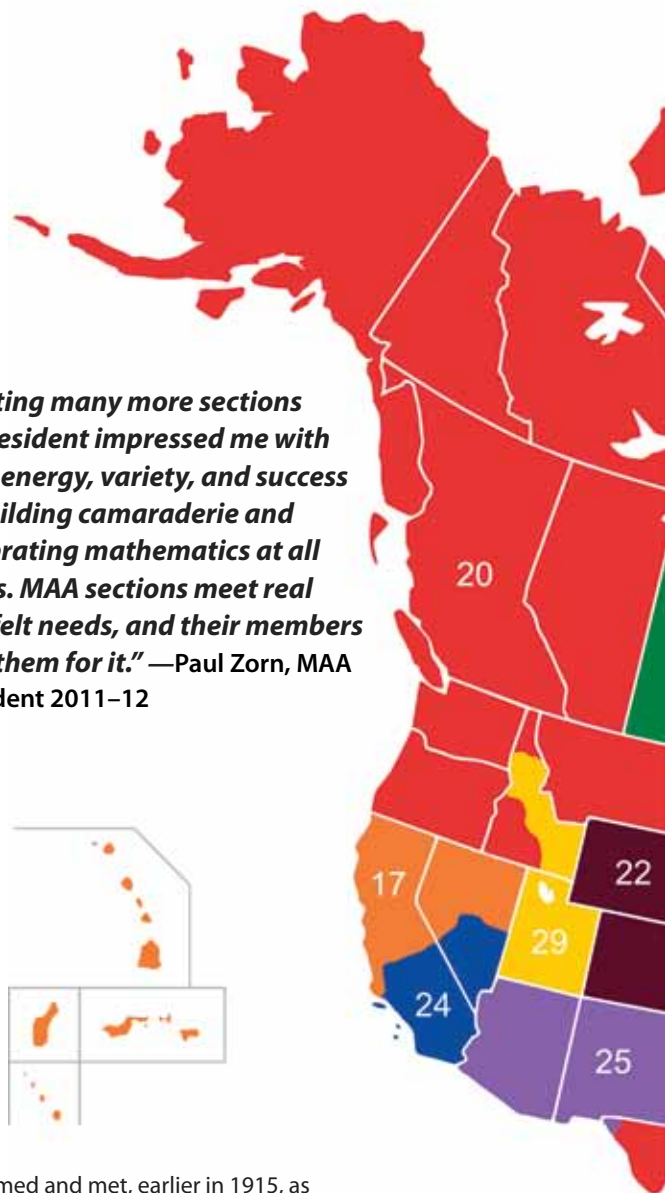
"Visiting many more sections as president impressed me with their energy, variety, and success at building camaraderie and celebrating mathematics at all levels. MAA sections meet real and felt needs, and their members love them for it." —Paul Zorn, MAA President 2011–12

The Kansas section of the MAA met in Lawrence, on March 18, 1916. This group had formed and met, earlier in 1915, as an association to improve mathematics teaching in Kansas. This appears to be the earliest photograph of an MAA section. Among those present is noted algebraic topologist Solomon Lefschetz, then at the University of Kansas.

1956

John Milnor: There is more than one differentiable 7-sphere.

1957

Sputnik launches U.S. education reform efforts.

1958

New Mathematical Library started by School Mathematics Study Group, with Anneli Lax as technical editor.

1960

Harry M. Gehman appointed first MAA executive director.

MAA takes over publication of Mathematics Magazine.

The MAA produced its first film in 1958: The Theory of Limits *with E. J. McShane, followed by Leon Henkin's* Mathematical Induction *in 1960.*

Section	No. on Map	Current No. of Members	Founded
Allegheny Mountain	1	234	1933
EPaDel-Eastern PA & Delaware	21	475	1926
Florida	2	306	1968
Golden	17	653	1939
Illinois	3	461	1917
Indiana	4	247	1916
Intermountain	29	103	1975
Iowa	5	125	1916
Kansas	6	103	1915
Kentucky	7	149	1917
Louisiana-Mississippi	8	142	1924
Maryland-DC-Virginia	9	850	1916
Metro New York	10	513	1941
Michigan	11	346	1923
Missouri	13	192	1915
Nebraska & Southeast South Dakota	14	72	1924
New Jersey	15	335	1956
North Central	12	318	1916
Northeastern	16	1017	1955
Ohio	18	420	1915
Oklahoma-Arkansas	19	173	1933
Pacific Northwest	20	606	1945
Rocky Mountain	22	286	1917
Seaway	27	451	1940
Southeastern	23	908	1922
Southern California-Nevada	24	617	1925
Southwestern	25	248	1936
Texas	26	552	1920
Wisconsin	28	247	1932

1962

First Award for Distinguished Service goes to Mina Rees.

1963

Paul Cohen proves continuum hypothesis independence.

1965

MAA holds summer celebration of its 50th anniversary at Cornell University.

R. H. Bing's address as retiring MAA president.
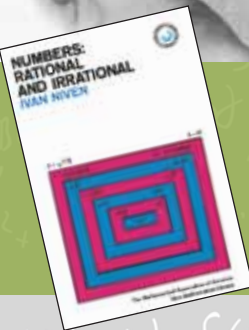
1969

First International Congress on Mathematical Education (ICME), Lyon, France.

National Association of Mathematicians founded.

Promoting Expository Writing

> "The founding of the MAA took the reverse of the usual route whereby an organization is established first and creates its official journal later. . . . Yet the MAA's official journal, the *American Mathematical Monthly*, was initiated more than 20 years before the Association was founded. So in this case, a journal (the *Monthly*) spawned an association (the MAA)." —David E. Zitarelli, 2015

Founding *Monthly* editor Benjamin F. Finkel and colleague J. M. Colaw announced the purpose and scope of their new journal in 1894 in the following words, which still ring true:

> It has seemed to the Editors that there is not only room but a real need for a mathematical Journal of the character and scope of the MONTHLY. At the present time there is no Mathematical Journal published in the United States sufficiently elementary to appeal to any but a very limited constituency, and that comes to its readers at regular intervals.
>
> Most of our existing Journals deal almost exclusively with subjects beyond the reach of the average student or teacher of Mathematics or at least with subjects with which they are not familiar, and little, if any space, is devoted to the solution of problems.
>
> While not neglecting the higher fields of mathematical investigation, THE AMERICAN MATHEMATICAL MONTHLY will also endeavor to reach the average mathematician by devoting regular departments to the important branches of Mathematical Science.

Subsequent editors put their own stamp on the publication, but they consistently maintained its emphasis on mathematical exposition and on the value of the solution of problems. For example, as H. E. Slaught put it in 1909, "The Editors of the MONTHLY have decided to open its columns to contributions on the teaching of collegiate mathematics, in the hope that some impetus may be given to the better training of teachers, the better arrangement and coordination of material and the better form and methods of presentation."

Marking the Centennial

In 1993, on the eve of the *Monthly*'s centennial, John Ewing, *Monthly* editor at the time, described the journal's enduring legacy: "Whether

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1970

The Two-Year College Mathematics Journal, *vol. 1, no. 1.*

1971

AWM

Association for Women in Mathematics founded.

1974

U.S. sends team to the International Mathematical Olympiad for first time.

American Mathematical Association of Two-Year Colleges founded.

1975

Rocky Mountain becomes the 29th MAA section.

Women and Mathematics lectureship program initiated.

it's a two-line problem or a 20-page survey, a contribution to the *Monthly* is a contribution to mathematical culture."

For more than 60 years, the *Monthly* was the only MAA journal. In 1962,

John Ewing. (1996)

Mathematics Magazine, already in existence for more than 35 years, became a publication of the MAA (though it did not become an official journal of the MAA until 1981). In 1970, the *Two-Year College Mathematics Journal* was obtained from publisher Prindle, Weber & Schmidt to become an MAA journal (and being renamed the *College Mathematics Journal* in 1984).

These publications were joined in 1990 by the student magazine *Math Horizons* and later by several online projects: *Communications in Visual Mathematics*, the *Journal of Online Mathematics and Its Applications*, and *Convergence.*

But communicating mathematics effectively was never easy. In a 1980 article titled "Can We Make Mathematics Intelligible?" *Monthly* editor Ralph P. Boas Jr. lamented: "Why is it that we mathematicians have such a hard time making ourselves understood? . . . To put it another way, why do we speak and write about mathematics in ways that interfere so dramatically with what we ostensibly want to accomplish? I wish I knew."

Books

The MAA began publishing books in the 1920s, boosted by a sizable gift from Mary Carus, the editor of Open Court Publishing Co. The purpose of her gift was to fund a series of inexpensive books of mathematical exposition. The first Carus Mathematical Monograph was *Calculus of Variations* by Gilbert Ames Bliss, published in 1925.

In the preface of his book, Bliss wrote: "The purpose of the monographs is to make the essential features of various mathematical theories accessible and attractive to as many persons as possible who have an interest in mathematics but who may not be specialists in the particular theory presented."

Bliss further noted that Mrs. Carus also identified a wider purpose of contributing to "the diffusion of mathematical and formal thought as contributory to exact knowledge and clear thinking, not only for mathematicians and teachers of mathematics but also for other scientists and the public at large."

Those sentiments remain guiding principles for MAA books, considerably expanded now to encompass a variety of book series, covering a wide range of mathematical topics, particularly textbooks, ebooks, and classroom resources for faculty.

1976

Appel and Haken: Four colors suffice!

1978

Purchase of MAA headquarters buildings in Washington, D.C.

Brooks and Matelski plot Mandelbrot set.

1979

Dorothy L. Bernstein: First woman to serve as MAA president.→

Mary Ellen Rudin ↓ gives Hedrick Lectures.

1981

MAA newsletter FOCUS debuts.

U.S. hosts the International Mathematical Olympiad in New York City.

Competitions

Just as problems (and their solution) were a central feature of the *American Mathematical Monthly* from the very beginning, problem-solving competitions, at both the high school and collegiate levels, have a long history as MAA-sponsored activities.

The first high school mathematical contest, sponsored by the MAA's New York Metropolitan Section, took place on May 11, 1950. It was given in approximately 238 schools to around 6,000 students in the New York area only. The following passage, taken from the contest committee report, addressed that year's participating teachers:

> The first mathematics contest sponsored by the New York Metropolitan Section of the MAA is now history. It was a lot of work getting the contest organized and finally holding it. Like all new projects, we worried about it. Would the High Schools participate? Would they like the test? Is it worthwhile? Will any good be produced by it? Will it be a success?

The MAA currently manages and supports the most prestigious mathematics contests in the United States, including the AMC 8 for eighth-graders, the AMC 10/12 competitions, the Advanced Invitational Mathematics Examination (AIME), the USA Mathematical Olympiad (USAMO), and the Mathematical Olympiad Summer Program (MOSP) for talented high-school students. The MAA also selects and leads the U.S. teams that participate in the International Mathematical Olympiad (IMO), the European Girls Mathematical Olympiad (EGMO), and the Romanian Master of Mathematics and Sciences.

Putnam

At the collegiate level, the annual William Lowell Putnam Competition has, since its inception in 1938, attracted the most accomplished undergraduate students of mathematics from academic institutions throughout the United States and Canada.

Over the years many distinguished mathematicians and scientists have participated in the Putnam exam. Among them are five Fields medalists, four physics Nobel laureates, the Nobel Prize winner in economics John Nash (portrayed in the film *A Beautiful Mind*), and two Abel Prize winners. One of the principal leaders in the Human Genome Project finished in the top 10 of the Putnam winners in 1976. He and another Putnam winner are MacArthur fellows. Four American Mathematical Society (AMS)

Standing outside the National Academy of Sciences are the 1998 USA Mathematical Olympiad Winners; left to right: Gabriel D. Carroll, Paul A. Valiant, Kevin D. Lacker, Melanie Eggers Wood, Sasha Schwartz, David T. Vickrey, David E. Speyer, and Reid W. Barton. Melanie Wood became the first U.S. girl to compete in the International Mathematical Olympiad.

1984

MAA editorial office moves from Buffalo, N.Y., to Washington, D.C.

The Two-Year College Mathematics Journal *renamed* College Mathematics Journal.

Louis de Branges proves Bieberbach conjecture.

Vaughn Jones: Knot polynomial tied up.

1986

First Mathematics Awareness Week proclaimed.

1987

Committee on Participation of Women formed.

1988

MAA presents Helaman Ferguson sculpture to AMS on its centennial.

Sculpture: *Torus with Cross-Cap and Vector Field #2*

presidents and one MAA president were successful participants in the Putnam competitions.

What was the easiest Putnam problem ever? Some would nominate A2 from 2002:

Given any five points on a sphere, show that some four of them must lie on a closed hemisphere.

Solution: Given five points on a sphere, any two determine a great circle. Choose any pair of points and consider the great circle they determine. One of the hemispheres created by that great circle contains at least two of the other three points.

What was the hardest Putnam problem ever?

Joe Gallian, MAA president 2007–2008, has suggested that it might be A6 from 1979:

Let $0 \le p_i \le 1$ for $i = 1, 2, \dots, n$. Show that

$$\sum_{i=1}^{n} \frac{1}{|x - p_i|} \le 8n\left(1 + \frac{1}{3} + \frac{1}{5} + \dots + \frac{1}{2n-1}\right)$$

for some x satisfying $0 \le x \le 1$.

No person in the top 200 scored any points on this problem.

"The feature of MAA that distinguishes it from other mathematical and scientific organizations is its focus on collegiate mathematics. This focus was enabled—some might say, compelled—by the special history of higher education in the United States. Earlier than other nations, the U.S. developed a robust array of undergraduate colleges where some focused on the classical liberal arts while others stressed the nation-building skills of agriculture and engineering. Mathematics was crucial to both types of education, and was the only scientific subject widely taught in every grade from kindergarten through college. MAA's founders had the foresight to recognize the special need for a professional organization to support those who taught mathematics in the colleges of the growing nation. The tradition continues to this day, now joined by scores of other mathematical and scientific organizations both in the U.S. and around the world."
—Lynn A. Steen, MAA President 1985-86
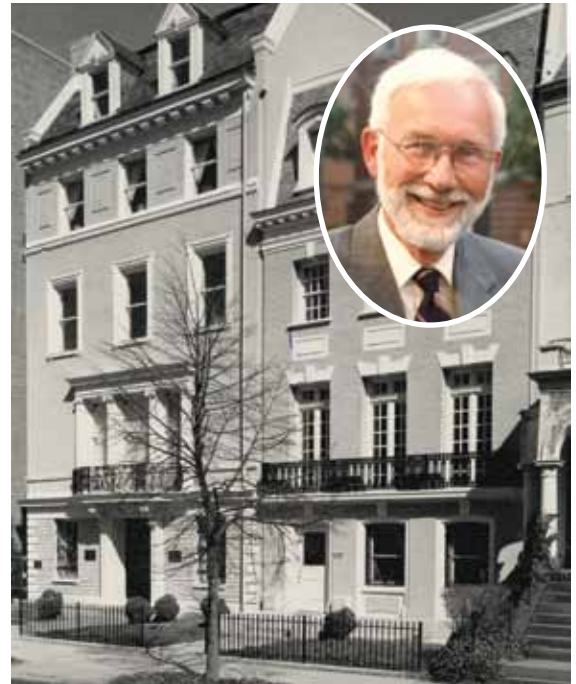
MAA Headquarters in Washington, D.C. (1990) Al Willcox (inset) was named executive director after the move to D.C. and oversaw MAA expansion.

President Calvin Coolidge addressed the winter meeting of the MAA, held jointly with several other societies, on December 31, 1924, in Washington, D.C. Secretary of State Charles Evans Hughes addressed the same meeting. The current MAA headquarters complex in the Dupont Circle neighborhood includes the house occupied by Hughes at that time.

1990

Strengthening Underrepresented Minority Mathematics Achievement (SUMMA) launched. Bill Hawkins, SUMMA director.

1993

Math Horizons *starts.*

First Haimo award for distinguished teaching.

Andrew Wiles announces proof of Fermat's last theorem (corrected in 1995).

1994

Launch of Project NExT.

MAA on the World Wide Web at www.maa.org.

U.S. International Mathematical Olympiad team places first and makes history with six perfect scores.

1997

Communications in Visual Mathematics, *first MAA online journal.*

First MathFest summer meeting run by MAA.

Advancing the Profession

Supporting professional development of mathematics faculty is a vital component of the MAA's mission. MAA Project NExT (New Experiences in Teaching) is a professional development program for new or recent PhDs that addresses all aspects of an academic career: improving the teaching and learning of mathematics, engaging in research and scholarship, and participating in professional activities. Project NExT also provides participants with a network of peers and mentors as they assume these responsibilities. More than 1,500 fellows have participated in Project NExT since its founding in 1994.

"I am proud to be a teacher—Teaching is an ephemeral subject. It is like playing the violin. The piece is over, and it's gone. The student is taught, and the teaching is gone."
—Paul Halmos

Here's how it all started, as reported in *FOCUS* by Project NExT co-directors James R. C. Leitzel and T. Christine Stevens: "Sixty-six Project NExT fellows gathered on August 12th in Blegen Hall on the campus of the University of Minnesota. Thus began a series of presentations, discussions, short courses, and interactions that spread over three days prior to the opening of the summer MathFest activities in Minneapolis. Project NExT was launched!"

Another important MAA focus is expanding opportunities in mathematics for women and for underserved minorities. One key program, Strengthening Underrepresented Minority Mathematics Achievement (SUMMA), has the mission of challenging and involving the collegiate mathematics community in making fundamental changes in its attitudes and practices, particularly with regard to minority students.

SUMMA was established in August 1990 as a result of recommendations made by the MAA Task Force on Minorities in Mathematics, which completed its two-year, groundbreaking work in January 1989.

"Leaders of the MAA, recognizing the magnitude of the problem of underrepresentation of minorities in the mathematical sciences and mathematics-dependent fields, affirmed that strong moral, societal, and economic justifications exist for this national program which has two goals: increase the representation of minorities in the fields of mathematics, sciences, and engineering and improve the mathematical education of minorities. In its September 1989 policy statement, the MAA committed its human and financial resources to provide leadership to carry out these goals, apparently the first professional organization in the country to make such a resolution." —William A. Hawkins Jr., SUMMA Director

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1998

Thomas Hales: Kepler conjecture on packing spheres conquered.

1999

Tom Banchoff gives first James R. C. Leitzel Lecture.

Mathematics Awareness Week expands to span April.

2000

RUME (Research in Undergraduate Mathematics Education) named first SIGMAA.

MAA Mathematical Sciences Digital Library announced.

Icosahedron Society created to honor major donors.

2001

U.S. hosts International Mathematical Olympiad in Washington, D.C.

First issue of Journal of Online Mathematics and Its Applications *is posted.*

Strengthening Diversity

"The glue that binds the members of the MAA is interest in mathematics and the teaching of mathematics. All who share that interest should feel a part of this organization. There cannot be any other considerations for membership and for full participation. As mathematicians, we would like to think that we are above discrimination, that all we value is that someone shares our love of mathematics. That has not always been the case and it might not be today. But it is the ideal for which we strive." —Tina Straley, 1995

In 1994, the MAA began sponsoring jointly with the National Association of Mathematicians the David Blackwell Lecture at its annual summer meeting. David Blackwell, shown above, presented the first lecture in the series now named in his honor.

In 1988 an MAA task force addressed the issue of communities underrepresented in mathematics. Two years later, the MAA established SUMMA to increase the representation of minorities and improve education of minorities in mathematics (see page 14).

The Association for Women in Mathematics was established in 1971 with the goal of encouraging the participation of women in mathematics. At its summer meeting that year, the MAA sponsored a panel titled "Women in Mathematics." In January 1974, the MAA Board of Governors approved a recommendation that "the MAA participate in a joint committee with AMS in an investigation of the status of women in Mathematics."

The AWM inaugurated a series of annual lectures at the 1996 MathFest to honor women who have made distinguished contributions to the mathematical sciences or mathematics education. These lectures became a joint effort of the AWM and the MAA eight years later, when the name became the Etta Z. Falconer Lectures.

The lecture series named for Etta Z. Falconer (shown here in a 1991 photo) honors a distinguished educator and mathematician who was widely known for her efforts toward increasing diversity in the mathematical sciences.

"I have devoted my entire life to increasing the number of highly qualified African Americans in mathematics and mathematics-related careers. High expectations, the building of self-confidence, and the creation of a nurturing environment have been essential components for the success of these students." —Etta Z. Falconer (1995)

2003

Perelman proves the Poincaré conjecture.

2004

The online magazine Convergence *posts its first articles.*

Rudolphine Tables in *Convergence's* Mathematical Treasures.

2007

Carriage House Conference Center dedicated.

2010

Steve Strogatz presents first Gerald and Judith Porter public lecture.

Supporting MAA

"To address rising costs, the MAA was incorporated in 1920 under the statutes of the state of Illinois, an important move that allowed the Association to receive donations and bequests; the AMS followed suit three years later. The MAA took advantage of this status right away when Herbert Slaught announced a sizable gift from Mary Carus, the editor of Open Court Publishing Co. The purpose of her gift was to fund a series of books to publish mathematical exposition at nominal cost." —David E. Zitarelli, 2015

Following the plaque unveiling in 1990, guests gathered before the newly dedicated George Pólya Building in Washington, D.C. From left to right: President Lida K. Barrett, John W. Kenelly, Executive Director Marcia P. Sward, Ronald C. Rosier, and Anthony Lanyi.

Over the years, such generous gifts have funded a wide variety of prizes, professional development programs such as Project NExT, various publications, and other MAA activities. It took a significant fundraising effort, starting in the 1970s, to purchase, then upgrade and renovate at various times the three historic buildings in Washington, D.C., that currently constitute the Dolciani Mathematical Center, which houses MAA headquarters.

The names of the two main buildings honor such contributions. The Edgar H. Vaughn Building is named in honor of the grandfather of James Vaughn, president of the Vaughn Foundation, a major contributor to the 1978 MAA Building Fund. The George Pólya Building recognizes Pólya's major bequest to the MAA.

Many of the rooms within these buildings bear names and plaques honoring other important donors.

In 2003, the MAA received a gift of $3 million from Paul and Virginia Halmos to establish a Mathematical Sciences Conference Center in Washington, D.C. The association restored to its former charm the exterior of its historic carriage house, the third building in the MAA complex, and renovated completely the interior to accommodate conferences of up to 60 people, with ample additional space for mathematicians to meet in smaller groups or to work individually.

Project NExT participants in 2014.

"The MAA is at least distinctive, and probably unusual, in its commitment to promoting community, camaraderie, and friendship among its members. To put it another way, the MAA is a mathematical 'big tent,' encompassing and supporting a broad range of mathematics and mathematicians." —Paul Zorn, MAA President 2011–12

2011

MAA begins offering ebooks.

2014

Maryam Mirzakhani wins Fields Medal.

Yitang Zhang publishes breakthrough on twin primes.

2015

The centennial MAA MathFest in Washington, D.C.