

**AMERICAN MATHEMATICAL SOCIETY
EXECUTIVE COMMITTEE AND BOARD OF TRUSTEES
NOVEMBER 16-17, 2001
PROVIDENCE, RHODE ISLAND**

MINUTES

A joint meeting of the Executive Committee of the Council (EC) and the Board of Trustees (BT) was held Friday and Saturday, November 16-17, 2001, at the AMS Headquarters in Providence, Rhode Island. The following members of the ECBT were present: Roy L. Adler, Hyman Bass, Robert L. Bryant, John B. Conway, Robert J. Daverman, David Eisenbud, John M. Franks, Eric M. Friedlander, Linda Keen, Andy R. Magid, Joel H. Spencer, B. A. Taylor, and Karen Vogtmann. Felix E. Browder was unable to attend.

Also present were: Donald G. Babbitt (Publisher), Gary G. Brownell (Chief Financial Officer), John H. Ewing (Executive Director), Ellen H. Heiser (Assistant to the Executive Director [and recording secretary]), Jane E. Kister (Executive Editor/Mathematical Reviews), James W. Maxwell (Associate Executive Director/Meetings and Professional Services), Constance W. Pass (Controller), and Samuel M. Rankin (Associate Executive Director/Government Relations and Programs).

Patricia E. Bauman (Chair, Committee on the Profession) and Roger E. Howe (Chair, Committee on Education) were present for the Friday-afternoon session.

President Bass and Board Chair Adler presided.

Items occur in numerical order, which is not necessarily the order in which they were discussed at the meeting.

0	CALL TO ORDER AND ANNOUNCEMENTS
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0.1 **Opening of the Meeting and Introductions.**

President Bass convened the meeting and everyone introduced themselves.

0.2 **2001 AMS Election Results.**

Secretary Daverman announced the results of the 2001 election as follows. All of these individuals will take office on February 1, 2002, with the exception of the Nominating Committee members, whose terms begin on January 1, 2002. The complete teller's report will be attached to the January 2002 Council agenda and minutes.

President Elect

David Eisenbud (Mathematical Sciences Research Institute)

Vice President:

Hugo Rossi (University of Utah)

Trustee:

Carol S. Wood (Wesleyan University)

Members at Large of the Council:

Colin C. Adams (Williams College)

Sylvia T. Bozeman (Spelman College)

Irene M. Gamba (University of Texas at Austin)

Henri A. Gillet (University of Illinois at Chicago)

David R. Morrison (Duke University)

Editorial Boards Committee:

Clifford J. Earle (Cornell University)

Svetlana Jitomirskaya (University of California, Irvine)

Nominating Committee:

Sheldon Axler (San Francisco State University)

Robert M. Fossum (University of Illinois at Urbana-Champaign)

Jane Hawkins (University of North Carolina at Chapel Hill)

The Secretary also announced that the proposed amendments to the Bylaws concerning voting mechanics were approved.

0.3 Housekeeping Matters.

Executive Director Ewing informed the ECBT about several housekeeping matters related to the present meeting.

1 EXECUTIVE COMMITTEE ACTION/DISCUSSION ITEMS
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1.1 Draft Agenda for the January 2002 Council Meeting.

The Secretary provided a draft of the January 2002 Council agenda and requested advice from the EC regarding the content. Regarding the item about the April 2002 Council meeting (item 7.4), the EC asked the Secretary to include a list of possible discussion topics for consideration by the Council.

1I EXECUTIVE COMMITTEE INFORMATION ITEMS

1I.1 Secretariat Business by Mail. Att. #2.

Minutes of Secretariat business by mail during the months April 2001 - September 2001 are attached (#2).

2 EXECUTIVE COMMITTEE AND BOARD OF TRUSTEES ACTION/DISCUSSION ITEMS
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2.1 Report on Committee on the Profession (CoProf). Att. #3.

The ECBT received the attached summary (#3) of CoProf's September 22, 2001 meeting. This summary was supplemented by an oral report from CoProf Chair Patricia Bauman.

2.2 Report on Committee on Meetings and Conferences (COMC).

The ECBT received an oral report on recent COMC activities from COMC Chair Karen Vogtmann.

2.3 Report on Mathematical Reviews Editorial Committee (MREC). Att. #4.

The ECBT received the attached summary (#4) of MREC's October 1-2, 2001 meeting. This summary was supplemented by an oral report from Executive Editor Jane Kister on behalf of MREC Chair Hugh Montgomery, who was unable to attend the ECBT meeting.

2.4 Report on Committee on Education (COE). Att. #24.

The ECBT received the attached summary (#24) of COE's October 26-27, 2001 meeting. This summary was supplemented by an oral report from COE Chair Roger Howe.

2.5 Report on Committee on Science Policy (CSP). Att. #5.

The ECBT received the attached report (#5) on recent CSP activities. This report was supplemented by an oral report from Associate Executive Director Sam Rankin on behalf of CSP Chair Felix Browder, who was unable to attend the ECBT meeting.

2.6 Report on Committee on Publications (CPub). Att. #6.

The ECBT received the attached summary (#6) of CPub's September 8, 2001 meeting. This summary was supplemented by an oral report from CPub Chair Robert Bryant.

2.7 Report from the President. Att. #7.

The ECBT received the attached summary (#7) of President's Bass's recent activities. This summary was supplemented by an oral report from President Bass.

2.8 Washington Office Report. Att. #8.

The ECBT received the attached summary (#8) of recent Washington Office activities. This summary was supplemented by an oral report from Associate Executive Director Rankin.

2.9 Proposed Joint Congressional Fellow. Att. #9.

The ECBT was informed that the Society had been approached by the American Astronomical Society about sharing support for an American Association for the Advancement of Science (AAAS) Congressional Fellow. Att. #9 contains preliminary details and the approximate cost of such a fellow.

The idea was viewed favorably by the ECBT. When the details are worked out, a formal proposal will be brought to the ECBT for action.

2.10 Report of Long Range Planning Committee (LRPC). Att. #21.

The LRPC met on November 16, 2001. The ECBT received the following report on this meeting from LRPC Chair, Karen Vogtmann:

The LRPC received an update on business planning, discussed the role of the LRPC, and discussed the general topic of controlling expenditures on outreach and service (non-income producing activities, known as NIPAs - see Att. #21). The majority of the meeting was spent discussing the role of the LRPC and whether it should continue to exist, even though the Committee currently has very little business. It was pointed out that, when the LRPC was founded, the description of the operation noted that the LRPC would become active at some times, and inactive at others. At the moment, the LRPC appears to be in one of the quiescent periods envisioned by its founders. It was the consensus that the Committee should continue to exist, as its membership is representative of the AMS's governing bodies, and therefore the Committee is uniquely positioned to consider governance and other issues that fall outside the purview of other committees or cut across several committees. It was further agreed that the LRPC should continue to meet at every ECBT meeting, with the understanding that during quiescent periods it will meet informally (i.e., without an agenda).

2.11 Making Backfiles of AMS Journals Available Online. Att. #10.

At its September 2001 meeting, the Committee on Publications (CPub) considered a proposal to make back issues of AMS journals available online without charge on the AMS website five years after publication. See Att. #10. CPub endorsed the proposal and recommended it to the January 2002 Council for approval.

Because implementation has a financial impact on the Society, the Board was asked to consider the proposal. The ECBT voted to approve the proposal and recommend it to the January 2002 Council for approval.

2.12 Update on the Project to add Reference Lists and Forward Citations to the MR Database. Att. #22.

A status report on the project to add reference lists and forward citations to MathSciNet was presented at the May 2001 ECBT meeting. Att. #22 updates that report. It was noted that, in particular, reference lists and forward citations are now available on MathSciNet. At the level

originally approved, there will be ongoing additions of reference lists from current issues of the 65 journals selected for the project.

Staff proposed to expand the project by adding references lists from back issues (the years 1997-99) of the selected journals. This will enhance the value of the collection of reference lists and forward citations by vastly expanding the network of links between related pieces of mathematics throughout MathSciNet. The estimated cost of the backward expansion is \$100,000 (for the conversion of the reference lists to tagged XML format). This is a one-time expense. The BT approved the proposal.

2.13 Expanding Eligibility for Life Membership.

At its September 22, 2001 meeting the Committee on the Profession endorsed a staff proposal to significantly expand eligibility for life membership. The ECBT reviewed a description of the option for life membership currently in effect, the new proposal for life membership, and the motivation for the expansion along with an analysis of the impact on dues revenue.

The ECBT was generally in favor of the proposal in principle. Suggestions were made for clarifying the goal of, and rationale for, the idea, and staff was asked to reformulate the proposal based on these discussions for presentation to the January 2002 Council. The ECBT then voted to recommend that the Council seriously consider the proposal. It was noted that, if approved by the Council, an amendment to the Bylaws would be needed. The exact wording of the Bylaws amendment could be put before the April 2002 or January 2003 Council, and then placed on the 2003 election ballot for approval by the membership.

2.14 Naming Opportunities and Minima for Endowment Funds. Att. #12.

At its last meeting, the ECBT agreed to name a section of the outside garden area at the Providence headquarters in memory of Radha G. Laha, who made a bequest to the Society's unrestricted endowment of approximately \$190,000. After that discussion, the staff was asked to formulate a basic policy for such naming opportunities in the future. The staff was also asked to create a policy about the size of named funds within the endowment.

The ECBT endorsed the attached proposal (Att. #12).

2.15 Report on Joint Policy Board for Mathematics.

The Executive Director reported that the Joint Policy Board for Mathematics (JPBM) met on November 5, 2001. This is the second meeting held under the new JPBM structure in which responsibility for organizing the program rotates among the three member societies. The May 2001 meeting was organized by the AMS; the November 2001 meeting was organized by SIAM. In addition to discussion of science policy, a portion of the meeting is now devoted to discussion of broader issues of common concern, including publication and membership.

2.16 Spring Agenda and Budget Committee Meeting by Conference Call.

Once before (not long ago!) the Executive Director proposed holding meetings of the Agenda and Budget Committee (ABC) by conference call. After discussion, it was decided that continuing the present face-to-face meetings would be helpful, especially to those attending the meeting for the first time.

At its recent meeting, however, the ABC once again raised the issue, and specifically proposed that its *spring* meeting be held by conference call, with the fall meeting continuing to be face-to-face. It was further proposed that the Investment Committee hold its fall meeting (which traditionally is held immediately before the ECBT meeting) on the same day as the fall ABC.

At present, the agenda of the ABC meeting fits within a few hours. The "agenda" part consists of walking through the agenda to identify items that need further information or that are misplaced, as well as to add items that are missing. The aim is to avoid discussing issues twice, once at the ABC and again at the ECBT meeting itself. The "budget" part of the meeting in the fall is substantial, reviewing the budget for the upcoming year as well as the projections for the current year. Consultation with members of the ABC affects the final budget for the upcoming ECBT. In the spring, however, the budget discussion is largely a preview of the discussion that takes place at the May ECBT meeting.

The ECBT agreed that the spring ABC meeting should be held by conference call, and that the fall Investment Committee meeting should be held on the same day as the fall ABC meeting.

2.17 Membership on Policy Committees.

Both the Secretary and the Executive Director are *ex officio* members of all five policy committees. When the committees were established, their creators saw a need for a fine balancing of power. The Secretary was made a voting member of Meetings and Conferences, Profession, and Publications, but a non-voting member of Education and Science Policy. The Executive Director was made a voting member of Education and Science Policy, but a non-voting member of the rest.

This seems to be a distinction without a purpose. Votes of the various committees are merely recommendations to other bodies, and both the Secretary and Executive Director fully participate in all five committees. The distinction serves mainly as a (minor) nuisance.

Therefore, the Secretary and Executive Director recommended that the ECBT consider recommending to the Council that the charges of each of the five policy committees be changed so that both the Secretary and Executive Director have the same privileges as other members of each policy committee.

Since this distinction is only a "minor nuisance", and the policy committees are currently functioning well, the ECBT decided not to forward this recommendation to the Council.

2.18 2002 Operating Plan.

The 2002 Operating Plan was mailed to members of the ECBT on October 26, 2001. The plan includes the following sections for each division or department:

- I Mission
- II Ongoing Activities and Functions
- III Trends and Issues
- IV Future Projects and Activities
- V Financial Implications

Comments or questions on the Plan were invited, but none were offered.

It is noted for the record that after Section VI (Report on Projects and Activities) is completed in spring 2003, a complete, official copy of the 2002 Operating Plan will be attached to record copies of the May 2003 ECBT minutes.

2.19 Motions of the Secretary.

Immediate Past President Felix Browder's photograph was presented and installed in the gallery of past presidents that is maintained at the Society's headquarters.

The following motions were approved by acclamation:

The Executive Committee and Board of Trustees of the American Mathematical Society record their thanks to Joel H. Spencer for his service to the Society as a member of the Executive Committee during the past four years. They express the hope that Professor Spencer will continue to be available to serve the Society in other ways.

The Executive Committee and Board of Trustees of the American Mathematical Society record their thanks to Andy R. Magid for his service to the Society as a member of the Board during the past five years. The ECBT expresses its gratitude to Professor Magid for his wisdom in contributing to the management of the Society and hopes to be able to draw upon his talents again.

2C EXECUTIVE COMMITTEE AND BOARD OF TRUSTEES CONSENT ITEMS

2C.1 May 2001 ECBT Meeting.

The ECBT approved the minutes of the meeting of the Executive Committee and Board of Trustees held May 18-19, 2001, in Providence, Rhode Island. These minutes include:

- ECBT open minutes prepared by the Secretary of the Society,
- ECBT executive session minutes prepared by the Secretary of the Society,
- BT executive session minutes prepared by the Secretary of the Board.

2C.2 SIAM's Fiftieth Anniversary.

The ECBT approved the following resolution:

The American Mathematical Society takes great pleasure in sending its warmest congratulations to the Society for Industrial and Applied Mathematics on the occasion of its Fiftieth Anniversary.

SIAM's first fifty years have been filled with many accomplishments on behalf of the mathematical sciences. The AMS wishes SIAM continued success and looks forward to further collaboration on efforts to enrich the mathematics profession and to promote public understanding of the beauty and power of mathematics.

2I EXECUTIVE COMMITTEE AND BOARD OF TRUSTEES INFORMATION ITEMS

2I.1 Report on AMS Website. Att. #16.

Att. #16 contains a status report of the new and revised products and services on the AMS website. Of particular interest was the January 2001 release of the new AMS website - a significant redesign now organized based on "collections" of information rather than audience groups.

2I.2 Summary of AMS Archiving. Att. #17.

The attached report on archiving procedures (#17) was prepared for the September 2001 Committee on Publications meeting.

2I.3 Digitizing the Older Mathematical Literature. Att. #18.

Earlier in the year, the Director of the Division of Mathematical Sciences at NSF, Philippe Tondeur, discussed a large-scale proposal to digitize older mathematical literature with several people, including the Executive Director of the Society. Tondeur asked the Executive Director to write a white paper on the subject, outlining the general concept, a proposal for distributing material after the project was complete, and the most important difficulties to overcome. The white paper was completed in August and is contained as Att. #18.

The ideas expressed in the white paper will serve as the basis for a workshop to be held in 2002, supported by NSF and organized by Cornell University. The ideas will also be considered by the Committee on Electronic Information and Communication of the International

Mathematical Union, which holds its next meeting in February of 2002. That Committee will make recommendations to the General Assembly which next meets in Beijing during the coming year.

2I.4 AMS-MER Professional Master's Programs Grant.

Three workshops on professional master's degrees were held through an NSF grant to the AMS and the Mathematicians and Education Reform Forum (MER), in cooperation with SIAM. The first workshop was held November 5-7, 1998 at the Courant Institute of Mathematical Sciences. The participants were from doctoral granting mathematics departments and a major focus was financial mathematics. The second workshop, held at Arizona State University, November 4-6, 1999, included participants from master's degree granting institutions as well as doctoral departments. This workshop considered many different types of professional master's degrees, including industrial, engineering, education, statistics, and business. The third and final workshop, held October 18-20, 2001 at the University of Cincinnati, included participants from master's degree and doctoral degree departments. This workshop focused on professional master's degrees in mathematics education. (This last workshop was originally scheduled for September 13-15, 2001 and was rescheduled after the events of September 11.) All three workshops were well-attended.

2I.5 Support for Scholarship Fund. Att. #19.

Following the events of September 11, a scholarship fund was established for the children and spouses of victims of the attack. The American Physical Society led an effort to establish a subfund directed at students who pursue degrees in science and engineering (including mathematics). They sought support from other scientific societies to advertise the existence of the subfund to members. Joining APS were the American Association for the Advancement of Science, the American Chemical Society, the American Institute of Physics, the American Astronomical Society, and the American Mathematical Society. AAAS is currently soliciting other sponsors from among its member societies.

The rationale for creating the scholarship fund and subfund is clear. While there have been many charities set up to benefit the survivors and their families, most deal with immediate needs; this fund will have a longer lasting effect on the lives of the children of the victims. It is a show of support for those victims by the science and engineering community that at the same time is consistent with our mission to promote scientific research and scholarship.

Other than advertising to AMS members the opportunity to give, there is no financial commitment to the Society. Further information can be found in **Att. #19**.

2I.6 Actions of the Agenda and Budget Committee (ABC).

At its October 5, 2001 meeting in Providence, Rhode Island, the ABC took the following action:

The ABC set the schedule for the November 2001 ECBT meeting.

3 BOARD OF TRUSTEES ACTION/DISCUSSION ITEMS
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3.1 Discussion of Fiscal Reports.

The BT received and discussed various fiscal reports, as well as a budget discussion memo.

The BT voted to approve the 2002 budget, as presented and modified by actions taken at this meeting.

3.2 Budgeted Staffing Levels.

The BT approved the 2002 personnel budget as presented.

3.3 Capital Expenditures - 2002 Capital Purchase Plan.

The BT approved the 2002 capital purchase plan as presented.

3.3.1 Capital Expenditures - Approval of Specific Purchases. *BROWNELL.*

This agenda item is reserved for requests for authorization to make specific large purchases (items costing \$100,000 or more). No such requests were made at this meeting.

3.4 Investment Committee Report.

The BT received a report on the November 16, 2001 Investment Committee meeting.

3.5 Expenditures from the Program Development Fund.

The BT received the following report summarizing all expenditures from the Program Development Fund. It was noted that each expenditure had already been approved separately.

At the start of 2001, the Program Development Fund was \$216,287. During the year, \$112,500 was spent as follows:

\$75,000	Young Scholars Program (second year)
\$25,000	Discoveries and Breakthroughs (a program of the American Institute of Physics)
\$ 2,500	minority database development
\$10,000	Math Jobs Service (Duke University web-based program)

At the start of 2002, the Program Development Fund will have approximately \$104,000. During 2002, the following expenditures will be made:

\$75,000	Young Scholars Program (third year)
\$10,000	Math Jobs Service (Duke University web-based program)

This will leave approximately \$19,000 in the Fund, in addition to contributions made throughout the year.

3.6 Proposed Allocation of Unrestricted Endowment Income.

At its May 2001 meeting, the Board authorized using income from the endowment with unrestricted income to support designated projects of the Society. Each fall, the Board will approve the allocation as part of the budget process. The individual projects are either ongoing or approved separately. This item only approves the allocation of the available income.

Available funds are calculated as 5% of the average unrestricted endowment for the preceding three years. For 2002, available income is approximately \$261,000.

Staff proposed, and the BT approved, allocating income from the unrestricted endowment as follows for 2002:

\$133,000	Math Reviews citation project (for keyboarding expense to Apex for previous years)
\$50,000	Centennial Fellowship match (usual one-for-one matching funds for contributions)
\$30,000	STIX font project (funds to pay for outside font development – joint project among six members of STIPUB group of scholarly publishers)
\$27,000	<i>What's Happening in Mathematics</i> (payment to outside writer for volume 5)
\$20,000	Project NeXT (support for 6 NeXT fellows for 2002-03, stipends and activities at annual meeting)

3C BOARD OF TRUSTEES CONSENT ITEMS

3C.1 Recognition for Length of Service. *BROWNELL.*

The BT approved the following resolutions for the employees noted.

20 years of service:

Nancy G. Kaull
Cheryl M. Marino
Donna L. Salter
Twila M. Price

The Board of Trustees takes great pride in recognizing _____ for twenty years of faithful service. It is through the dedication and service of its employees that the Society is able to effectively serve its members and the greater mathematical community. The Trustees offer _____ their special thanks and their best wishes.

25 years of service:

Ellen H. Heiser

The Board of Trustees takes great pride in recognizing _____ who has devoted twenty-five years of service to the Society. The Board expresses its profound gratitude for this long record of faithful service. It is through the dedication and service of its employees that the Society is able to effectively serve its members and the greater mathematical community. The Trustees offer their special thanks and their best wishes to _____ for being such a loyal employee and wish her well in the future.

30 years of service:

G. Richard Kelly
Eberhard G. P. Gerlach

The Board of Trustees takes great pride in recognizing _____ for the outstanding distinction of serving the Society for thirty years. The Board expresses its profound gratitude for this long record of faithful service to the Society. It is through the dedication and service of its employees that the Society is able to effectively serve its members and the greater mathematical community. The Trustees offer their special thanks and their best wishes to this loyal employee.

35 years of service:

Leonora T. Davol
Ralph W. Sizer

The Board of Trustees takes great pride in recognizing _____ for the outstanding distinction of serving the Society

for thirty-five years. The Board expresses its profound gratitude for this long record of faithful service. It is through the dedication and service of its employees that the Society is able to effectively serve its members and the greater mathematical community. The Trustees offer their special thanks and their best wishes to _____ for being such a loyal employee and wish her well in the future.

3C.2 Resolution for Retiree.

The BT approved the following resolution:

Be it resolved that the Trustees accept the retirement of Malayattil Rabindranathan with deep appreciation for his faithful service over a period of twenty-eight years. The Board expresses its profound gratitude for this long record of faithful service. It is through the dedication and service of its employees that the Society is able to effectively serve its members and the greater mathematical community. The Trustees offer Rabi their special thanks and heartfelt good wishes for a happy and well-deserved retirement.

3C.3 Small Change to Retirement Plan.

Retirement contributions are accrued based on payments recorded in the payroll system. Contributions are accrued for persons while on short-term disability. Employees in RI who are on short-term disability have a portion of their pay covered by the State of Rhode Island, and such pay is not included in the payroll system, and no retirement contribution is made relating to such pay. Employees in other offices receive a full contribution while on short-term disability. This change in the plan will result in the Society's treating both groups of employees equally with respect to retirement contributions.

The BT approved the following language for inclusion in the retirement plan:

Credited compensation for non-exempt (hourly) employees means all wages paid (excluding overtime wages and severance payments) and payments made under the Society's Short Term Disability program including payments from a state disability plan in any Plan Year for the period during which the Employee is a Participant in the Plan, up to but not exceeding the amount of the Employee's regularly scheduled weekly wages at the time of the commencement of the disability. For exempt employees Credited Compensation shall mean all salaries paid (excluding severance payments) including payments made under the Society's Short Term Disability program including payments made for a state disability plan in any Plan Year for the period during which the Employee is a Participant in the Plan, up to but not exceeding the amount of the Employee's regularly scheduled weekly salary at the time of the commencement of the disability.

For both non-exempt and exempt employees, compensation shall also include amounts contributed to an annuity or account pursuant to a salary reduction agreement and which is not included in the Participant's gross income under Section 403(b) of the Code. In addition, Credited Compensation shall also include amounts contributed to a Premium Reduction Account, Dependent Care Account and/or Medical Reimbursement Account. Credited Compensation shall be limited to a Participant's first \$200,000 for any Plan Year of such greater amount as prescribed by the Secretary of the Treasury in accordance with Section 415(d) of the Internal Revenue Code (i.e. \$235,840 for 1993). For Plan Years beginning on or after January 11, 1994, the first \$160,000 (indexed as of year 1999) or any such greater amount as permitted under Section 401(a)(17) of the Code of an Employee's Compensation shall be taken into account for purposes of the Plan in any one Plan Year.

3C.4 Support of Speakers at 2003 AAAS Annual Meeting.

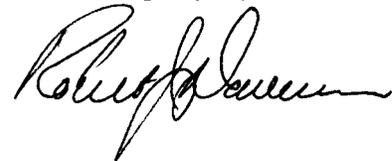
The BT authorized \$10,000 to support speakers for the Mathematics Section at the 2003 annual meeting of the American Association for the Advancement of Science (AAAS).

3I BOARD OF TRUSTEES INFORMATION ITEMS

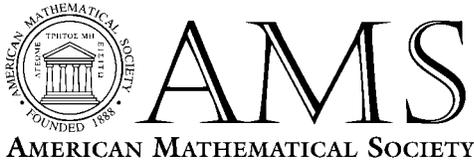
3I.1 Economic Stabilization Fund Increment.

Apart from adjustments due to positive or negative returns, it is not expected that there will be any addition to the Base Economic Stabilization Fund or the Supplemental Economic Stabilization Fund for 2001.

Respectfully submitted,



*Robert J. Daverman, Secretary
Knoxville, Tennessee
December 21, 2001*



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**SECRETARIAT
Business by Mail
April 30, 2001**

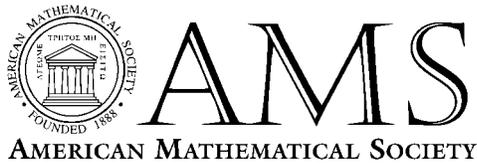
MINUTES

from the Ballot dated April 1, 2001

There were five votes cast by John Bryant, Robert Daverman, Susan Friedlander, Lesley Sibner and Bernard Russo.

1. Approved electing to membership the individuals named on the list dated March 20, 2001.
2. Approved a Southeastern Sectional meeting to be held at Louisiana State University, Baton Rouge, LA, on March 14-16, 2003.
3. Approved the draft minutes of the 11 January 2001 Secretariat meeting as distributed by e-mail (and also reproduced in the agenda of the 23 March 2001 Secretariat meeting).
4. Approved the minutes of the Secretariat Business by Mail from the ballot dated April 2, 2001.

Robert J. Daverman



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**SECRETARIAT
Business by Mail
May 31, 2001**

**MINUTES
from the Ballot dated May 1, 2001**

There were four votes cast by John Bryant, Robert Daverman, Susan Friedlander and Bernard Russo.

1. Approved electing to membership the individuals named on the list dated April 20, 2001.
2. Approved (by a vote of 3-0) a Central Sectional Meeting to be held at Ohio University in Athens, Ohio, on 26-27 March 2004.
3. Approved reclassifying the Western Sectional Meeting in Portland, Oregon, on 20-22 June 2002 as a Sectional Meeting held in conjunction with the MAA.
4. Approved an Eastern Sectional Meeting to be held on 10-12 October 2003 in Binghamton, New York, at SUNY-Birmingham.
5. Approved an AMS Council meeting to be held on 05 January 2002 in San Diego, California.
6. Approved an AMS Council meeting to be held on 14 January 2003 in Baltimore, Maryland.
7. Approved an AMS Council meeting to be held on 13 April 2002 in Chicago, Illinois.
8. Approved the minutes of the Secretariat Business by Mail from the ballot dated April 2, 2001.

Robert J. Daverman



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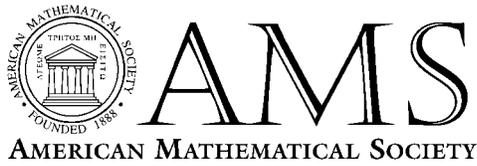
**SECRETARIAT
Business by Mail
July 1, 2001**

**MINUTES
from the Ballot dated June 1, 2001**

There were five votes cast by John Bryant, Robert Daverman, Susan Friedlander, Bernard Russo and Lesley Sibner.

1. Approved electing to membership the individuals named on the list dated May 20, 2001.
2. Approved (4-1) AMS cosponsorship of the 6th International Conference on Clifford Algebras and their Applications to Mathematical Physics, 20-25 May 2002, in Cookeville, Tennessee.
3. Approved holding the 2007 Joint Mathematics Meeting in New Orleans, Louisiana, on 4-7 January 2007.
4. Approved the minutes of the Secretariat Business by Mail from the ballot dated May 1, 2001.

Robert J. Daverman



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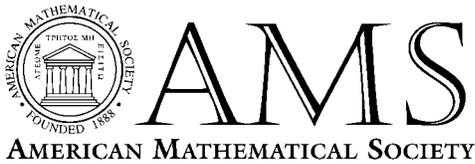
**SECRETARIAT
Business by Mail
August 1, 2001**

**MINUTES
from the Ballot dated July 1, 2001**

There were four votes cast by John Bryant, Robert Daverman, Susan Friedlander and Bernard Russo.

1. Approved electing to membership the individuals named on the list dated June 20, 2001.
2. Approved the minutes of the Secretariat Business by Mail from the ballot dated June 1, 2001.

Robert J. Daverman



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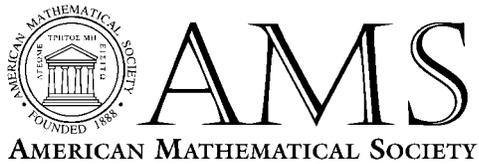
**SECRETARIAT
Business by Mail
September 4, 2001**

**MINUTES
from the Ballot dated August 6, 2001**

There were four votes cast by John Bryant, Robert Daverman, Susan Friedlander and Bernard Russo.

1. Approved electing to membership the individuals named on the list dated July 20, 2001.
2. Approved the minutes of the 23 March 2001 Secretariat meeting as distributed earlier, on 18 April 2001, by the AMS Meetings and Conferences Department.
3. Approved a Western Sectional Meeting to be held October 26-27, 2002, at the University of Utah in Salt Lake City, Utah.
4. Approved holding the 2005 Joint Mathematics Meeting in Atlanta, Georgia, on 5-8 January 2005.
5. Approved the minutes of the Secretariat Business by Mail from the ballot dated July 1, 2001.

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**SECRETARIAT
Business by Mail
October 1, 2001**

**MINUTES
from the Ballot dated September 4, 2001**

There were five votes cast by John Bryant, Robert Daverman, Susan Friedlander, Bernard Russo and Lesley Sibner.

1. Approved electing to membership the individuals named on the list dated August 20, 2001.
2. Approved the minutes of the Secretariat Business by Mail from the ballot dated August 6, 2001.

Robert J. Daverman

Committee on the Profession Highlights

September 22, 2001

Chicago O'Hare Hilton

The Committee on the Profession (CoProf) discussed several items related to membership. First, they endorsed staff's proposal to amend the eligibility criteria for life membership. (See the item in Section 2 of the ECBT agenda.) They also discussed the merits of the creation of a special category of honorific membership in the society, *Fellow of the AMS*. The general view was that creating a highly selective membership would be helpful to departments in advancing their outstanding mathematics faculty for recognition within their institution. Coprof recommended to Council that it form a subcommittee of the Council with a charge to study the merits of a fellows program. The Council will be provided with further background from the Coprof discussion and a profile of fellows programs of other professional societies.

The committee reviewed the method of election adopted by Council to fill Nominating Committee and Editorial Boards Committee positions, known as approval voting. After a review of a report on the merits of various voting systems from Donald Saari, the committee decided against recommending to Council any change in the current method of election used for these two committees.

The January 2001 Council approved in principle a new prize for the Best Paper Appearing in an AMS Publication. The committee approved an operational description of the new prize based on a draft by Secretary Daverman. The committee also passed a motion that recommends that Council consider naming the prize after E. H. Moore.

Over the coming year, subcommittees of Coprof will evaluate proposals for prizes in several other areas, including a book prize, a book or research monograph manuscript prize, and a non-research prize for outstanding achievement by a mathematics department. Coprof will consider subcommittee recommendations on each of these at its September 2002 meeting.

As part of its annual review of areas of Society activity within its charge, Coprof received a preliminary report on the Society's activities in the area of professional development from a subcommittee consisting of Frank Quinn (chair), Roy Adler, Jonathan Rosenberg, and Karen Smith. Coprof members will gather additional information on the Society's activities in this broad area in the coming year, discuss these activities with their colleagues, and report briefly on this at its next meeting. For its annual review for 2002, subcommittees will be formed to conduct reviews of Society activity in the areas of 1) human rights of mathematicians and 2) professional ethics and responsibilities and report on these at the next meeting.

Prepared by Jim Maxwell
October 22, 2001

Report on the Mathematical Reviews Editorial Committee October 2001

The Mathematical Reviews Editorial Committee (MREC) met for its annual meeting in October. As is customary, an important discussion item on the agenda concerned statistics related to the MR Database, in particular those related to the year 2001 additions to the Database. It was noted that both the number of new items and the number of new reviews are expected to be marginally higher than the corresponding numbers for the year 2000; the number of new items will not show the dramatic increases that we have seen in several recent years. The treatment of new items was also considered. The percentage of new items that are simply listed without further review varies quite considerably from section to section, from 3.4% to 49.4%. The MR editors, who were present for much of the meeting, suggested various reasons why this was the case. The breakdown between peer reviews and reviews by abstract also generated comment. It was noted that user surveys indicated that peer reviews are much appreciated. It was agreed that as further enhancements to the MR Database and MathSciNet that add value are considered another user survey, targeted for 2003, would be helpful.

At its 2000 meeting, MREC had supported proposals for two new projects: adding reference lists and forward citations to the MR Database and MathSciNet; and adding (unclassified) items in areas that have not previously been covered in the MR Database. Updates on both projects were presented at the 2001 meeting.

The references/forward citations project has now been implemented. MathSciNet now contains reference lists for over 6,500 journal articles from 65 selected journals, together with the associated forward citations. (For a full report see the item in Section 2 of the ECBT agenda.) The project is ongoing. The 65 journals (which were selected last year by the MR editors with advice from MREC) contain about 5,000 new articles each year, for which reference lists will be captured and added to the MR Database and MathSciNet. The relative merits of expanding the project laterally, by adding new journals, and expanding it by adding earlier years of the 65 journals were discussed. In light of the plan to invite publishers to submit reference lists from their own journals (in the appropriate tagged format), it was suggested that expansion of the reference-list journals processed by MR be delayed until the level of publisher response was known. Meanwhile, the proposal to expand coverage of the original 65 journals back a further three years was strongly supported. A spreadsheet was distributed showing how the over 100,000 references already in MathSciNet break down by publication year, which clearly indicates the value of the older literature.

Version 7 of MathSciNet includes "Database Expansion Items", which are unclassified items (without review) broadly speaking in the area of applied statistics. Librarians and others have asked that additional items in statistics be covered because the Current Index to Statistics database is no longer a part of the MathSci collection of databases. The addition of Database Expansion Items to the MR Database in part responds to that request.

Increasingly, parts of the older literature are being made available in electronic form. For mathematics literature from 1940 on, the AMS's policy is to construct links from the MathSciNet entries to the originals. (This has been done, for example, for those AMS journals

available on JSTOR.) MREC considered the possibility of adding to the MR Database links to some of the pre-1940 literature that is available electronically (for instance, the pre-1940 issues of the *Annals of Mathematics* and the *American Journal of Mathematics*) and then linking the items in MathSciNet to the originals. There were varying opinions on the value of such a project, suggesting that it would be of more value for those in pure mathematics than those in applied mathematics. It was also suggested that expansion of the reference lists project would be more valuable than the addition of older data. Further analysis of the costs and possible usage of such data will be carried out before a final decision is made.

MREC approved a general policy on the coverage of electronic conference proceedings. There has been a proliferation of such proceedings available on the Web and it would be impossible to cover them all with current resources. Moreover, some such proceedings have the character of preprints rather than being the electronic version of a conference volume. The policy establishes guidelines that it is hoped will limit coverage to a reasonable level without ruling out any particular e-proceedings.

MREC returned to an issue discussed at its previous meeting: coverage of Chinese journals. The Committee heard that since the last meeting 20 journals have been dropped and a further collection designated for at most bibliographic listings. The Committee recommended that further input be sought from Chinese mathematicians on the quality of the remaining approximately 120 journals now covered.

MREC received reports on: changes in the reviewer credit system; the new version of the Web review submission form; changes in the procedures for processing reviews; subscriptions to MR-related products; and news related to Zentralblatt MATH.

Jane Kister
October 2001

**AMS Committee on Science Policy
Report
October 2001**

CSP last met April 20-21, 2001, and a report on that meeting was submitted to the May ECBT. The committee will next meet in spring, 2002.

Since the last report members have, along with the AMS Contact Group, been alerted at sensitive times during the FY 2002 appropriations process and urged to contact their legislators in support of NSF funding. AMS President Hyman Bass began the work in spring by testifying before the House Appropriations Subcommittee on VA-HUD-Independent Agencies, jointly with the presidents of the American Chemical Society, the Federation of American Societies for Experimental Biology, and the American Physical Society. In May, former CSP member Jane Hawkins, and several other mathematicians, were brought to Washington for the annual Congressional Visits Day, joining over two hundred scientists, mathematicians, and engineers making visits to their Members of Congress. CSP members used the summer recess to make grass roots contacts with their legislators in home districts. Normally, these contacts would be intensified during the fall, when the conference committees horse-trade the final numbers, but this year is not a normal one and AMS, in concert with other professional societies, has been taking a low-key approach in urging support for science at a time when Congress is battling with issues of terrorism and war.

CSP will sponsor, jointly with the MAA Committee on Science Policy, a government speaker at the January 2002 Joint Mathematics Meetings in San Diego. James Schatz, NSA, will speak on "Mathematics at the National Security Agency", on Tuesday, January 8, at 4:20 pm. CSP had also planned an address by Eric Lander, Director of the Whitehead Center for Genome Research, but Dr. Lander has since cancelled. It is still hoped that a replacement speaker can be arranged for the CSP panel time slot.

Submitted by Monica Foulkes
AMS Washington Office
October 19, 2001

American Mathematical Society Committee on Publications

8 September 2001
Providence, Rhode Island

Summary

The following members of CPub were present: Donald G. Babbitt, Robert Bryant (Chair), Robert J. Daverman, Nathaniel Dean, John H. Ewing, Jay R. Goldman, Martin Golubitsky, Palle E. T. Jorgensen, Linda Keen, Gail D. Ratcliff, Donald G. Saari, and Ronald J. Stern. Hyman Bass and Keith J. Devlin were unable to attend.

Also present were: Donna Harmon (Assistant to the Publisher), Jane E. Kister (Executive Editor/Mathematical Reviews, María Lebrón (Associate Publisher) and Steven H. Weintraub (Chair, Subcommittee to Review the AMS Primary Journals).

CPub appointed a subcommittee to review the AMS primary journals. Steven Weintraub, Chair of the subcommittee, gave an oral summary of the report. His committee felt that overall the journals seemed to be healthy. He noted, however, a few points of general concern: Some editorial board members complained of the amount of work involved in being an editor, the continuing large backlogs of some of the journals, most notably that of the *Proceedings of the AMS* (18.1 months) and *Mathematics of Computation* (18.6 months), and the attrition in subscriptions of some of the journals over the last 5-year period.

The committee made some suggestions regarding the points of concern, accepted the report with thanks and agreed to forward copies to the Managing Editors of each of the primary journals, and to Council with comments.

It was reported that the Council modified the proposal concerning approval of editorial committee appointments formulated by CPub at its September 2000 meeting and adopted the modified proposal. The modifications affected the Editorial Committee positions with automatic membership on the Council.

Publisher Donald Babbitt reported that the interval between initial electronic posting and assignment of volume and page numbers has been narrowed in most cases, thus lessening the time between acceptance and posting of an article on the AMS website. The committee suggested that AMS staff could also include, in the electronic version of each of the AMS primary journals, a list of upcoming articles and corresponding authors. It was agreed that including such a list would be worthwhile and AMS staff will proceed accordingly.

Publisher Babbitt reported on the progress in developing a web page emphasizing the benefits of LaTeX2e that includes links to various guidelines and tools for preparing well-structured LaTeX2e files. CPub suggested including samples of bad LaTeX2e constructions and providing corresponding good

solutions. In addition, it was suggested that the documentation might include information on the use of tools such as Bibtex, perhaps including instructions on how to use MathSciNet to compile the .bib files.

Publisher Babbitt pointed out that the project to aid independent mathematics journals to obtain DOIs that came out of last year's CPub meeting has changed to aiding these journals to create suitable article metadata in order to participate in the article linking initiative of CrossRef, a non-profit organization of Scientific, Technical & Medical (STM) publishers.

Publisher Babbitt outlined the AMS strategy for electronic archiving of AMS journal articles and also informed the committee of policies of some other, similar organizations. There was some concern about the lack of a paper archive of the electronic-only journals (*Conformal Geometry and Dynamics* and *Representation Theory*). It was agreed that a paper archive could, and would, be created and maintained.

The committee considered the proposal of making available for free the electronic AMS journal back files older than 5 years. It was agreed that making the material available electronically for free would be worthwhile for the mathematical community and a motion was passed encouraging the AMS to make such back files available for free on its website. It should be noted that the committee rejected the idea of making this material readily available to other entities or individuals other than JSTOR at this time.

Recently the *Annals of Mathematics* has become an "overlay journal" on the arXiv, (the mathematics section of the well-known Ginsparg e-print archive). Articles appearing in the *Annals* back to 1995 are now electronically available on the arXiv for free. (Earlier issues going back to Vol. 1 are available on JSTOR to JSTOR subscribers.) The committee considered a proposal to make AMS journals overlay journals on the arXiv but decided against making a recommendation at this time.

Donald Saari, Chief Editor of the *Bulletin*, reported that the health of the journal is much improved. His long-term goal is to make the *Bulletin* more readable, and he continues to work on bringing in and training new editors. There are sufficient papers in reasonable shape to get through the 2002 subscription year. It was agreed that annual reports to CPub on the health of the *Bulletin* are no longer necessary. The committee expressed its thanks to Chief Editor Saari for the excellent job that he has done on the *Bulletin* recovery effort.

Publisher Babbitt gave a general status report on the publication program. In particular, mentioning the journal consortia project underway for 2003, and the electronic availability of a number of backlist book titles on the AMS website for free.

Publisher Babbitt informed the committee that the Society was publishing more than 100 books this year. He also brought to CPub's attention the considerable shortfall in budgeted revenue expected this year, apparently due in large part to the state of the economy.

Jane Kister, Executive Editor of *Mathematical Reviews (MR)* reported on a recent significant enhancement to MathSciNet: The addition of full bibliographical references to the MathSciNet review entries, as well as links to articles cited in bibliographies where available. The committee was very impressed with this feature of MathSciNet and expressed its appreciation.

The committee agreed that the next area of review, according to the schedule which operates in a 4-year cycle, will be a review of the electronic journals and the AMS website.

Submitted by Donald Babbitt

Report from the AMS President to the ECBT November, 2001

Since the May ECBT meeting, in fact since September 11, the world has changed, and continues to change for all of us in many ways. We might think that our world of mathematical research is mostly quarantined from the effects of such events, apart from the increased difficulties of travel that affect us all. But mathematics is more than an edifice of ideas and methods. It is a human activity, carried on by an intellectual community. The tragic events of September reminded us of how much this community is both international and close. Mathematicians throughout the world, both individually and as organizations, wanted to convey their sympathy with what had been suffered here, and their expressions of solidarity with America. Their main connection with America was through the fellow mathematicians that they know here. In particular, many very moving messages from throughout the world were sent to the AMS. A brief acknowledgement and expression of thanks will appear in the next issue of the Notices.

Since the AMS is, through its publishing, also a substantial business enterprise, it is vitally affected by the ambient economy. There are significant concerns here, again influenced by 9/11, on which John will report more detail. Similarly, we are attentive to the fate of our investment portfolio in the recently battered markets.

My report in May highlighted the following areas of major policy concern:

- Improved resources for the mathematics research enterprise.
 - Mathematics Education.
 - Outreach and public image.
 - The AMS as a major publisher.
-
- The situation on research funding is not the disaster that once seemed possible. On the other hand, it is not what we had hoped. Discussions of this in DC have receded in the wake of 9/11.
 - Much active work is being done by math organizations and individual mathematicians in mathematics education. This seems promising, and puts the mathematics community in a good light. My own involvement is documented in the calendar below.
 - For public outreach, certainly the most significant event was the International Mathematics Olympiad, hosted this time by the US. It was a spectacularly successful event in the views of many, myself included. Thanks to many people, not least to Arthur Jaffe and the Clay Foundation, the closing ceremonies and dinner were quite splendid, and gave mathematics some wonderful public exposure. I have the impression that the occasion warranted a good deal more public image than in fact we achieved in the media.
 - See comments above about publishing issues.

Calendar of Activities, May - November, 2001

Long term:

- Oversight Board for the Park City Mathematics Institute (run by the Princeton IAS).
- Consultant to Video Case Study Group for Professional Development of Teachers
- Work on a Panel of RAND/OERI on planning for programmatic research in mathematics education.
- President of ICMI (International Commission on Mathematics Instruction, the mathematics education analogue of the IMU, which organizes quadrennial international congresses, among other things.)
- Consultant on the revision of the CMP curriculum, at Michigan State U.
- Advisory Board for a HS curriculum project at the Educational Development Center in Cambridge, MA.
- PI on an NSF project at the Univ. of Michigan: Developing a Practice-Based Theory of Mathematical Knowledge for Teaching.
- Teaching: This term I am teaching a linear algebra course in the Math Dept, and, in the School of Education, a math methods course for (future) elementary teachers.

Chronology:

May 5-6, 2001: CBMS and CSSP in DC.

May 16, 2001: Public Service Awards to Vernon Ehlers and Neal Lane, by AMS, AAS, and APS, at the Capitol in DC.

May 17-20, 2001: AMS ECBT @ Providence.

May 21, 2001: JPBM meeting @ DC, chaired by HB

May 22-24, 2001: AMS/Mexican Math Soc. Joint international meeting, in Morelia, Mexico.

June 3-4, 2001: Ceremonies of celebration of USA Math Olympiad @ the Washington Office (MAA Building).

June 16-23, 2001: Meeting of the international program committee for the International Congress on Mathematics Education (ICME 10), in Copenhagen.

June 30 - July 9: With Deborah Ball I was a plenary speaker at the bi-annual British Mathematics Education Congress, in Staffordshire. Also we gave invited talks on mathematics education at the University of London and at Warwick University.

I met with Trevor Stewart, President of the London Mathematical Society, who attended our London talk. We discussed AMS/LMS relations, as well as their desire for an LMS/SIAM reciprocity agreement. With regard to AMS, we agreed that it would be desirable to schedule a second joint meeting, likely again at the Newton Institute. The AMS is receptive to this idea, and Bob Daverman is pursuing it with the LMS people.

LMS has purchased an imposing Victorian building on Russell Square (near the British Museum), which they have remodeled and were in the process of occupying. They seem very proud of these new quarters. Apparently LMS is quite well endowed, largely thanks the Hardy estate.

July 13: I participated in the spectacular closing ceremonies of the International Mathematical Olympiad, in Washington, at the Kennedy Center and the Federal Building.

July 17-23: I helped run an international meeting on mathematics education at the Park City Mathematics Institute (run by the Princeton IAS). I also met with the Oversight Board for PCMI.

July 30-31: I was an invited plenary speaker and participant at Project NExT meeting in Madison, Wisconsin. They were quite grateful for the new AMS support of six of the Project NExT fellows.

August 1-2: I participated in a meeting of the Advisory Board for the Cognitively Guided Instruction Project at the Univ. of Wisconsin.

August 18-22: I participated in a meeting in San Francisco of the RAND/OERI Panel on development of a programmatic research agenda for mathematics education research.

September 7-8: Planning meeting in DC for the November 1-2 Summit on activities flowing from the release of the MET (Mathematics Education of Teachers) document.

September 22: Meeting of CoProf in Chicago.

October 5: AM: Meeting of ABC, via conference call.

PM: Meeting with Judith Ramaley, the new Assistant Director of NSF, in charge of EHR (Education and Human Resources). Ramaley replaced Judy Sunley, who was acting Director of EHR. I was accompanied at this meeting by Sam Rankin and Deborah Ball. The meeting had several aims. (1) To get acquainted. (2) To make Ramaley aware of the many areas of substantial involvement of the mathematics research community in efforts to improve mathematics education in the schools. This included the MET report, various NRC projects, and the RAND Panel, which is chaired by Deborah Ball and involves several mathematicians. (3) To discuss the possibility of NSF support for an AMS administered project conceived by several of us, notably Roger Howe, to

provide some infrastructure and modest resources to support and professionalize the kind of educational work that mathematicians are now doing on an ad hoc, and *mostly pro bono* basis.

I think that we struck a good chord with this meeting. Ramaley (a former biologist and university president) seems to be a tough and quick thinker, and she took our message seriously and with interest to learn more. Some of us at the Committee on Education plan to draft a more concrete proposal for item (3) that might be submitted to the NSF.

October 11-12: I was invited to participate in a panel on math education, with Alan Schoenfeld and Elizabeth Stage, at the annual meeting of the National Academy of Education, held this year at UC Berkeley. I spoke about the roles of research mathematicians in efforts to improve mathematics education in the schools, the various forms these take, and why this their contribution is important.

October 17-19: Retreat with staff of the Video Case Study Group on professional development of teachers, in Portland, Maine.

October 26-27: Meeting of COE in DC.

November 2-3: National Summit on the Mathematics Education of Teachers (MET), in Tysons Corners, VA. With Deborah Ball, I shall give a plenary presentation. We are also, with Ed Dubinsky, planning a workshop on this, sponsored by MAA and Exxon/Mobil, to follow the joint meetings in San Diego.

Washington Office Report October 2001

The budget picture.

It's the middle of October and the Congress and the Administration have not completed the FY 2002 budget that was to go into effect October 1. The federal government is currently working via a continuing resolution. None of the 13 appropriations bills have been signed into law as of October 18. The conference committee for the VA-HUD-Independent Agencies appropriations bill (which contains the NSF budget) began deliberations the week of October 15, and the bill is expected to be completed by the end of October. You may recall that the House gave the NSF a 9.4% increase over the FY 2001 budget while the Senate proposed a 5.6% increase. Conversations with staffers indicate that the four leaders of the VA-HUD subcommittees are committed to providing NSF with as large an increase as possible – probably 7% or more. The President had proposed increasing NSF only 1.3% in his budget request.

Budget deliberations could be pushed into November as Congress remains preoccupied with the fallout from the events of September 11. As this is written we have been informed that the House will close for five days so that the House office buildings' ventilation systems can be checked for anthrax.

Some recent Washington Office activities.

In May the reception for the joint AAS-AMS-APS public service award was held to honor Representative Vernon Ehlers of Michigan, and former White House Science Advisor Neal Lane. Approximately one hundred people attended this event in the House Committee on Science Hearing room in the Rayburn House Office Building.

In June the AMS office participated in the Coalition for National Science Funding (CNSF) Exhibition. At this annual event, scientists and students supported by NSF exhibit results from research supported by the National Science Foundation. The Exhibition was quite successful with over two hundred people attending, including fourteen Members of Congress. The AMS co-sponsored an exhibit with MIT on undergraduate research. Three undergraduate mathematics students from MIT were present to explain their research. The AMS office, as usual, provided logistical help in the organization of the Exhibition.

A standing-room-only crowd of about eighty packed the AMS Congressional Lunch Briefing held on Capitol Hill in July. Cosponsored by long-time mathematics supporter Representative Vernon Ehlers (R-MI), the topic – a briefing on the National Research Council Report “Adding It Up: Helping Children Learn Mathematics”, was a timely one, given President Bush's Mathematics and Science Partnerships initiative and Ehlers' bills on mathematics and science education, one of which passed the House this year. The speakers for this year's briefing were Deborah Ball (University of Michigan), Hyman Bass, and Roger Howe. The speakers did an excellent job, obviously piquing the interest of the audience, judging from the comments and questions at the end of the presentation.

In September the AMS office helped organize, through a subgroup of the Committee on Education, testimony to the National Assessment of Education Progress (NAEP) governing board concerning the draft 2004 Mathematics Framework for the National Assessment of Educational Progress. . The subgroup consisted of Herb Clemens, Roger Howe, and Judy Roitman. The testimony was delivered by Herb Clemens.

In October the final AMS-MER NSF-sponsored workshop on professional master's degrees was held at the University of Cincinnati. Approximately seventy-five people participated in the workshop. Sam Rankin serves as co-director of the project and the Washington Office helps in the organization of the workshop.

Also in October, the Washington Office set up a meeting between Hyman Bass, Deborah Ball, and the new NSF Assistant Director of EHR, Judith Ramaley. Sam Rankin also attended. The main thrust of the meeting was to gain Ramaley's interest for developing a network of mathematicians to consult on issues of K-12 mathematics education. The meeting went quite well and Dr. Ramaley seemed very interested in the idea of such a network.

As always, the Washington Office continues to interact with other societies and professional organizations on issues of science and mathematics research and education. Several visits with Hill staffers regarding the NSF and other science budgets were organized with representatives of other societies during the summer. In September, Sam Rankin met with the new executive director of NCTM, Jim Rubillo.

Throughout the spring and summer the office has worked on acquiring commitments from speakers for the COE and CSP sessions at the Joint Mathematics Meeting, has continued to provide logistical support to the NSF-supported Preparing Future Faculty project, and the AMS-MER professional master's project.

Submitted by Samuel M. Rankin, III
October 18, 2001

The AMS has been approached by the American Astronomical Society (AAS) about sharing support for an American Association for the Advancement of Science (AAAS) Congressional Fellow. AAAS Congressional Fellows spend a year (typically September 1 to August 31) in Washington working in a Member of Congress' Office or for the Administration. This person usually takes a leave from a full time position, or is finished with a postdoctoral position, or has just received a PhD.

Sharing the expense of a Fellow with AAAS and perhaps one or two other societies reduces the cost to the AMS and increases the pool of possible candidates. Even if the person selected is not a mathematician, he/she will know that part of their support comes from the AMS and they will have contact with the director of the AMS Washington Office. During his/her tenure the Fellow works on a broad range of science policy issues, not on discipline-specific projects.

The Fellows spend two weeks in an orientation organized by AAAS. This orientation creates Fellows who are extremely valued and highly thought of on Capitol Hill. AAAS also helps place the Fellows.

The cost of supporting a fellow varies from society to society. Below I have outlined a possible scenario based on information gathered from other societies.

Approximate Cost: \$78,750

Stipend: (12 months): \$49,000

Fringe Benefits: \$12,250

Relocation: \$3,000

Travel (scientific meetings, meetings related to Fellowship assignment): \$3,000

Selection Process: (travel cost for selection committee meeting and interviews):
\$6,600

Advertising: \$2,000

AAAS Fee: (Orientation, placement): \$2,900

Submitted by Samuel M. Rankin, III
October 18, 2001

Back files of AMS Journals

Electronic files for the four dual AMS journals exist from 1996 forward. For the electronic-only journals they exist from 1997. The staff has recommended, and the Committee on Publications has endorsed, a proposal to make the existing electronic back files of journals available online without subscription five years after publication. This document contains some background and a rationale for that proposal.

Historical Background

Intellectual property is a peculiar notion.

The idea of owning something intangible embodied in the idea of copyright was inspired by printers, who were attempting to protect their interests—it had little to do with protecting the interests of writers. When first conceived, ownership of intellectual property was perpetual, which meant that a work was protected forever. The notion changed over time, however, and for many reasons. One key change was in America where the Constitution¹ incorporated the idea of intellectual property and copyright, but a right with limited duration.

It was a typically American idea to balance the need for free exchange of information against the need for incentives to those creating the ideas. It was purely practical. For that reason, copyright (which governs the ownership of intellectual property) was designed to be just enough to provide incentives ... and no more. Copyright was limited to 14 years (with a possible 14 year renewal), placing all works in the public domain after that initial period.

Over the ensuing years the length of copyright increased everywhere, partly because of attempts to create uniform copyright laws throughout the world, which meant that everyone had to agree to the maximum length already in place². Most recently, the length of copyright was extended to author's life plus 70 years.

In spite of attempts to make copyright uniform, the philosophical underpinnings diverged internationally. In much of Europe, intellectual ownership became identified with natural rights of authors, which could not be given away even if the author desired to do so. In the United States, intellectual ownership continued to be justified, as it was 200 years ago, by its practical necessity—just enough to provide incentives to create (or to publish) while not enough to deter access. (In reality, international pressure extends the period beyond what is practically necessary.)

¹ Article I, section 8 includes: “To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries...” The copyright act of 1790 provided for 14 years protection, renewable for a further 14 years.

² The Berne convention of 1886 eventually granted copyright for the life of author plus 50 years. The United States finally became a signatory in 1988.

Scholarly Journals

The general discussion is particularly relevant to scholarly journals. People who invest financial resources in producing journals need to recover costs. More than that, many of those people need to have financial incentives (that is, profit) to make publication worthwhile. Financial incentives not only make scholarly publishing possible in the first place but provide stability as well.

On the other hand, scholarship is best served when information is freely available to all scholars. Limiting ownership of scholarship therefore is just like limiting copyright: It is a matter of finding the right balance between two needs.

While this has always been the case, the system of print journals made it difficult to achieve that balance. Once published, copies of journals resided in multiple libraries throughout the world and access was through those libraries. Publishers could do little to affect access after publication except to offer back volumes of journals for sale. Since back volumes represented a steadily diminishing resource (with steadily increasing value), publishers charged for those back volumes, often steadily increasing prices as those volumes became scarce.

Electronic publishing has changed all this. Back files reside on the web, and are easily made available to all³. Back files no longer represent a diminishing resource with increasing value. Most publishers are not interested in using back files to generate revenue.⁴ It seems possible for publishers to achieve the balance between incentives and free information.

In addition, digitized versions of older journal articles have considerably *more* value than their print versions because they are part of a web of mathematical literature. There already is a large amount of published content on that web, and the amount of content is growing steadily. For an idea of the power of this resource, see the recent Opinion article by Harold Boas in the *Notices* included at the end of this attachment.

In addition to the growing body of literature initially published online, there now are expectations that much of the journal literature going back to the 19th century will be digitized in the coming years. (See Att. #18.) Again, this material will be valuable because it is part of a larger web of online literature.

Having access to that web will be essential for research mathematicians, and many groups are proposing ways to provide universal access. There is no shortage of ideas (or movements). For example there have been calls to boycott journals unless they make articles available after six months (see the Open Letter from the Public Library of Science

³ Easily made available for now. There may be substantial costs in updating back files in the future, which is the essential problem in archiving. No one fully understands those future costs.

⁴ The American Physical Society is an exception here: APS has invested more than a million dollars in making back issues of its important journals available online, and plans to charge for access. Its current files are (often) available with no charge at preprint servers.

at the end), and there was an editorial in the *Proceedings of the National Academy of Sciences* endorsing this idea (also at the end). While many of these proposals are in the life sciences, groups in every area of science are urging publishers to consider such proposals.

Of course, the challenge is to find proposals that provide access without destroying the system that creates and disseminates the material in the first place, that is, to find the appropriate balance mentioned above.

Proposal for the AMS

This is an opportunity for the AMS to take on a leadership role in scholarly publishing. It is evident that a six month window would place journal subscriptions at risk—many institutions would eventually drop subscriptions if it meant a short wait to have complete access to journals. On the other hand, it seems evident that a longer window greatly reduces that risk.

The AMS now collects relatively little money from selling its back files, and it already made a decision to distribute its older back files without compensation. In 1997, the AMS agreed to provide all articles published before 1992 in its four major research journals to JSTOR. While JSTOR is a subscription based service, its charges are meant only to recover the cost of digitizing the material and maintaining the collection; the Society receives no remuneration. The AMS recently made a commitment to continue providing material to JSTOR using this 5-year window.

The Committee on Publications considered a proposal to make all articles in the four dual research journals (JAMS, MCOMP, PAMS, TAMS) available online with no charge after five years, that is, articles become freely accessible when they are provided to JSTOR. The Committee unanimously endorsed the proposal.

In practice, since the online versions of these journals begin with 1996, issues would become freely available according to the following schedule:

<u>Beginning Jan 1</u>	<u>Subscription years freely available</u>
2002	1996
2003	1996-1997
2004	1996-1998
...	...
2010	1996-2004
...	...

Furthermore, the Committee proposes that a similar arrangement be made for the two electronic-only journals.

It is important to note that CPub did *not* recommend making files available to other groups for distribution—the recommendation is merely to make those files freely

available on the AMS website.

Will this adversely affect subscriptions? That's difficult to judge with *absolute* certainty, but it seems unlikely. Institutions that drop subscriptions because researchers will have access in 5 (often 6) years are probably going to drop subscriptions in any case. And the loss of a few subscribers may be made up for by the additional exposure the journals receive, both because mathematicians gain access to older articles and because the Society has taken a leadership role.

As time goes on, the Society will be under increased pressure to do something to achieve the balance talked about above. This is a good opportunity to do the right thing ... and to get some credit for it at the same time.

John Ewing

SEPTEMBER 2001 NOTICES OF THE AMS 789

Opinion

Archimedes and the Internet

Gedanken sind zollfrei, Martin Luther is supposed to have said—thoughts are toll-free. What about knowledge, in its modern electronic form? Should there be tolls on the information superhighway? Two recent experiences got me thinking about this question in the context of mathematical publication.

A colleague wandered into my office the other day, scratching his head in puzzlement. “I just got an e-mail from someone in Romania who wants a reprint of my paper in [well-known journal]. But the paper isn’t published yet! How in the world did someone find out about it?” I clicked the left mouse button in my Web browser exactly six times. “Eureka!” I cried, echoing Archimedes, “I have found it. Although the text of that journal is not online, the table of contents of the next issue is, and it lists your forthcoming article.”

The next day I received from Australia an e-mail request for an English translation that I published in 1983 of an article in the Russian mathematical literature. No electronic copy of that paper exists: the back issues of the journal have never been digitized, and in 1983 I was still using a typewriter. I had to write back asking for a postal address to which I could send a photocopy of the article.

These stories illustrate the state of electronic publication today. To *locate* scientific information by electronic means is typically straightforward, but to *obtain* the information electronically is often impossible. Sitting at the computer in my office, I can learn that my university holds a copy of Ver Eecke’s French translation of the works of Archimedes, but to read the text I must walk to the library and pull the physical book off the shelf. Will this situation soon change?

Tantalizing hints of an affirmative answer are already visible in MathSciNet (<http://www.ams.org/mathscinet/>), the electronic version of *Mathematical Reviews*, and in its European counterpart, the Zentralblatt MATH database (<http://www.emis.de/ZMATH/>). These compendia of reviews exploit the interconnectivity of the World Wide Web to provide links to the full text of many online articles at various publishers’ websites. Most publishers, however, restrict access to the articles to subscribers or to subscribing institutions.

Another vision of the future of electronic availability of scientific publications is the arXiv (<http://arXiv.org/>). Many physics preprints of the past decade are available there, and the mathematics collection is growing rapidly. Several journals, notably including the *Annals of Mathematics*, now contribute their articles to the arXiv after publication, thus guaranteeing that their contents will remain permanently and freely available in electronic form. If a large number of journals were to follow this lead, the arXiv could metamorphose from a preprint archive into a comprehensive digital library of the periodical mathematical literature.

Is such a development a realistic possibility? Some believe that it is not only achievable but inevitable, not only in mathematics but in other sciences also. To increase the momentum, thousands of researchers have signed an open letter at <http://www.publiclibraryofscience.org/> calling on publishers of scientific periodicals to allow the full text of articles that appear in their journals to be included in free online public libraries within six months of publication. The plea is backed by a threat that uncooperative publishers will lose not only the subscriptions of signatories but also their free services as authors, reviewers, and editors. Scientific researchers dedicate their lives to building up the edifice of human knowledge. Surely it is reasonable—so goes the argument—that once publishers recoup the expenses they incur in helping to paint the structure, they should then relinquish any claim to ownership of the building.

The value of a public database of journal articles goes far beyond easy access to the literature.

The “killer application” of such a database will be electronic searching of the full text of articles. For example, I recently became curious about the history of an old chestnut of integral calculus: Find the volume of the intersection of two right circular cylinders of equal radius whose axes meet at right angles. An electronic search at JSTOR (a subscription service at <http://www.jstor.org/>) located numerous variations of this problem in the *American Mathematical Monthly*, the earliest in 1895. But too little of the scientific literature is currently available in searchable electronic form to yield definitive answers to such historical questions. Indeed, the problem about the intersecting cylinders actually dates back over two millennia to the *Method* of Archimedes, the only extant source for which is a palimpsest auctioned at Christie’s in 1998 for \$2 million. I prefer to think of scientific knowledge as a shared public resource rather than as a commodity to be sold to the highest bidder. The success of TEX, the freely available, highquality software that we mathematicians use to write our papers, provides a model for the triumph of generous collegiality over greedy commercialism. “Give me a place to stand,” Archimedes is supposed to have said, describing the principle of the lever, “and I will move the world.” How much leverage will we apply to move the world toward online public repositories of our common scientific knowledge?

—Harold P. Boas, Editor

PLoS Open Letter

The Public Library of Science initiative began with the circulation of the following open letter, urging publishers to allow the research reports that have appeared in their journals to be distributed freely by independent, online public libraries of science.

If you support this initiative, we ask you to join **28335** of your colleagues from **172** countries in signing the open letter.

We support the establishment of an online public library that would provide the full contents of the published record of research and scholarly discourse in medicine and the life sciences in a freely accessible, fully searchable, interlinked form. Establishment of this public library would vastly increase the accessibility and utility of the scientific literature, enhance scientific productivity, and catalyze integration of the disparate communities of knowledge and ideas in biomedical sciences.

We recognize that the publishers of our scientific journals have a legitimate right to a fair financial return for their role in scientific communication. We believe, however, that the permanent, archival record of scientific research and ideas should neither be owned nor controlled by publishers, but should belong to the public, and should be freely available through an international online public library.

To encourage the publishers of our journals to support this endeavor, we pledge that, beginning in September, 2001, we will publish in, edit or review for, and personally subscribe to, only those scholarly and scientific journals that have agreed to grant unrestricted free distribution rights to any and all original research reports that they have published, through PubMed Central and similar online public resources, within 6 months of their initial publication date.

From Proceedings of the National Academy of Sciences, January 9, 2001.

Editorial

PubMed Central: The GenBank of the published literature

In 1999, Harold Varmus, then Director of the National Institutes of Health, proposed a bold new initiative called PubMed Central (PMC) designed to provide a central repository for literature in the life sciences [see Marshall, E. (1999) *Science* 284, 718]. Following an initial period of confusion, PMC now exists. It has a clear mission, a stable home, and a nucleus of papers. Its mission is to provide a comprehensive electronic archive of the peer-reviewed literature relevant to the biological sciences. Its home is the National Center for Biotechnology Information (NCBI), whose director is David Lipman. NCBI is also home to GenBank, the public archive of DNA sequences. The publications already present in PMC and freely accessible to the world's scientific community include all articles published in PNAS that are more than 1 month old and that were in a suitable electronic format, as well as articles from a number of other journals such as *Molecular Biology of the Cell*, *Arthritis Research*, and *Breast Cancer Research*. Several other journals, including *The British Medical Journal (BMJ)* and *Nucleic Acids Research (NAR)*, are committed to join. A full list is available at <http://www.pubmedcentral.nih.gov/>. PMC will contain only articles from the peer-reviewed literature and is not intended to be the sole repository or distributor of the publications that it hosts. In fact, journals are encouraged to distribute their material as widely as possible, through their own web sites or online distributors. Furthermore, publishers do not need to relinquish their normal copyright provisions for the further commercial use of the material. The great value that PMC brings to the scientific community is the opportunity to search not just titles and abstracts but entire papers for interesting content. Just as GenBank has proved invaluable to molecular biologists, PMC could serve an equally important role within the broader biological community. Once a central repository and archive for the world's biological literature becomes populated it will have a far-reaching impact on the conduct of scientific research. It will improve productivity and will allow new approaches to searching the literature. No longer will we need to spend hours searching among the stacks of the local, or not so local, library to find articles essential for our research.

Scientists, physicians, teachers, and lay people who are currently disenfranchised from the world's literature because of minimal research budgets will have access, perhaps not to the very latest research, but at least to reasonably current research. Our colleagues in the developing world and many of the smaller research institutions will have unprecedented access to the scientific literature.

To populate PMC, all life science journals are being asked to provide their contents free of charge following a suitable delay beyond the date of print publication. In the case of PNAS, the delay is 1 month; for other journals it may be longer. This delay is to mitigate any deleterious effect on subscriptions and the financial health of the journals that might result from free access. For instance, if a journal were to make its content immediately available to PMC, there would be a real danger that subscriptions to the print or online

copy of the journal would drop precipitously as libraries become increasingly pressed to find funds for journals. What is a reasonable delay? I would argue that 6 months seems a reasonable time for a journal to monopolize the content. Most of us would not dream of scanning the contents of a journal published 6 months ago unless we were searching for a specific article. Thus it seems unlikely that a large number of subscriptions would be lost if 6-month-old issues were made freely available. I think rather few worthwhile journals would be adversely affected if they were to institute such a policy. I thus welcome, and have signed on to, the initiative proposed by Pat Brown of Stanford University. He was one of the chief proponents of PMC and is now circulating an open letter from scientists urging journals to participate. The letter is currently posted at <http://www.publiclibraryofscience.org/>. Signatories show their support for open access and pledge to publish in, edit or review for, and personally subscribe to only those journals that grant unrestricted distribution rights within 6 months of publication to PMC and similar entities. As word of this initiative spreads, many of us hope that thousands of scientists, both senior and junior, will sign on. Even more important, we hope that many journals, especially the more prestigious ones, will join PNAS, NAR, BMJ, and others in agreeing to make their content freely available no later than 6 months after publication.

This initiative is very much a grassroots affair. All scientists from students to professors are being asked to join. It is an initiative that, if successful now, will provide a vital resource to students and their professors alike during the coming years. Why might a journal not join something that is so obviously good for science? Some publishers argue that they will lose revenues from subscriptions. This is hard to take seriously, when many journals make their dated content freely available on their own web site and some even offer prepublication copy. I suspect that many publishers and their senior editorial staff are fearful of losing control and jeopardizing favorite programs that they view as benefiting science and that are presently supported from journal profits. However, when I ask students, they seem overwhelmingly in favor of PMC. Indeed, as a practicing scientist how can one reasonably be against it? It will save much time and make invaluable resources uniformly available. It is good for everybody. Both GenBank and PubMed, also run from NCBI, have been immensely successful and have driven science forward. PMC is the next step.

One might have thought that the scientific societies would have been at the forefront to promote the interests of their members and to promulgate science by all means possible. So why have the major life science societies, such as the American Society for Microbiology (ASM), the American Society for Biochemistry and Molecular Biology (ASBMB), the American Association for the Advancement of Science (AAAS), etc., not followed the lead of the National Academy of Sciences and rushed to join PMC? At the very least, the societies should poll their members to gauge their enthusiasm for PMC. Could it be that the societies have become seduced by the cash that their journals produce, and the professional interests of the scientists they represent are taking second place? I would urge all scientific societies and academic publishers such as the university and institutional presses to take a hard look at their priorities and ask whether they support science or Mammon. I also urge the large commercial publishers to join PMC. They cannot claim to be serving the best interests of their customers by trying to

balkanize the published literature. Imagine how stymied we would all be without GenBank. Most of all, though, I urge our young scientists to think hard and carefully about this issue. Your future is at stake. Here is your chance to make your voice heard and indicate your priorities in the scientific enterprise. Join me and sign on!

Richard J. Roberts
New England Biolabs, Beverly, MA 01915

Endowment Funds and Naming Opportunities

The Society has three categories of endowment funds—funds with restricted income (\$2.3M), funds with unrestricted income (\$5M), and quasi-endowment funds (\$34.2M). The quasi-endowment merely consists of money the Society has chosen to segregate and invest for special purposes. This document discusses only the first two categories consisting of true endowments.

People who donate funds to the Society's endowment have varying expectations about their specific purposes. Some create specific (legally binding) restrictions — for example, giving money for prize funds, which are part of the restricted endowment. Others are more vague, leaving us with only the moral obligation to spend the funds to carry out the mission of the Society. These constitute the unrestricted endowment.

A complete list of both kinds of endowment funds can be found in the Fiscal Reports in section D. There are 18 named funds with restricted income (including Steele, Birkhoff, Veblen, etc., as well as the more recent Ky Fan and Epsilon.) There are six funds in the second category (including the Henderson fund as well as the more recent Morita and Laha funds.)

At its May 2001 meeting, the Board briefly considered two issues concerning contributions to the endowment.

(1) Endowments that establish prizes are governed by resolutions of the Council, stipulating that new prizes should be fully funded. (At the moment, for a typical prize of \$5,000 given every 3 years, this sets a minimum of approximately \$32,000.) For other endowments, either with restricted or unrestricted income, there is no minimum established in order to establish a named fund. What should the minimum be?

(2) For donations with restricted income, it is almost always the case that the donor (or designee) is honored through the name of the program or prize. For donations with *unrestricted* income, this is not the case. What is an appropriate way to honor those giving substantial gifts to the unrestricted endowment?

This document is intended to propose answers to both questions for consideration by the Board.

Minimum size for a named fund

The Society invests its endowment and quasi-endowment funds according the total return concept. Funds are pooled, the return on the entire portfolio is computed, and that return is distributed according the relative size of each fund. For actual investment purposes the individual named funds have no meaning.

For funds with restricted income, it is necessary to track that expenditures have been made in accordance with the donor's wishes. In case those wishes become difficult to carry out in the (distant) future, it is necessary to consider how to substitute appropriate alternative uses. In many cases, it is necessary to administer the program associated to the fund (prizes, travel awards, etc.), and in almost every case the Society bears the cost of that administration. For that reason, separately named funds with restricted endowment and potentially large administrative costs should be substantial.

On the other hand, precisely how to measure whether a donation is substantial enough depends on the nature of the restrictions and the extra burden to the Society. A gift that endows a specific activity (for example, a continuing annual event) may have almost no administrative cost, and a small endowment may be ideal for the purpose.

For funds with unrestricted income, there is virtually no cost to the Society in administering the funds. The only rationale for setting a minimum size is therefore the nuisance of having an increasing number of lines in the section D of the Fiscal Reports. This seems to be a very minor nuisance with little real effect on any part of the Society.

In both cases, a gift to the Society has to be accepted by the Board, so it can judge whether a gift is too small for a separate fund at that time. Setting minima therefore only restricts flexibility in dealing with donors. While it is essential to keep these considerations in mind, there seems to be no need to create rules that provide little additional value.

Naming opportunities

Naming opportunities are usually associated with capital campaigns, and they serve two purposes. The first is to attract gifts; the second is to honor those who provide substantial gifts.

The Society is currently not engaged in a capital campaign, of course, but we occasionally receive substantial gifts to the unrestricted endowment. Because such gifts are not associated to any specific program with the donor's name, there is an opportunity to honor the donor in some way.

The AMS does not have chairs or faculty positions. It has only a few buildings, and most of the space within the buildings is not distinguished enough to carry people's names. It *does* have lectures, which are already given as part of its annual meetings. It would be possible to name various invited addresses after donors. While this is possible, it could make varying the program of meetings more difficult in the future, and in any case it presents only a handful of naming opportunities.

The Society's headquarters has some attractive grounds, however, and the gardens near the entrance, around the front of the building, and along the river behind the building are steadily being developed. These provide exterior areas (rather than interior rooms) that can be named after donors who otherwise might not be suitably recognized. This was

done several years ago when the Morita family made a substantial unrestricted gift in memory of their father. The dedication of a garden area made a real difference to the family, which flew to Providence from Japan for the ceremony (and has kept in touch with the AMS since that time.) A similar garden area will be dedicated to Radha Laha in November.

Dedicating areas of our gardens in honor of substantial gifts has several benefits. It is a tasteful gesture that includes a small ceremony, making it possible to thank the donor and family personally. (This is true even if people do not attend the ceremony, since remarks and photos are easy to send.) It lends itself to suitable publicity for prospective donors. It is permanent since the area is designated by a bronze plaque. It is flexible since the areas can be constantly improved over time. It is expandable, since there are numerous garden areas that lend themselves to naming.

The drawback to naming garden areas is that it may not *cause* prospective donors to think of a major gift; that is, people are unlikely to make a gift because they want a portion of the garden named after them. Since this is unlikely for any naming opportunity (at least those the Executive Director can think of), this seems to be outweighed by the benefits mentioned above.

Proposal: For endowment gifts with income unrestricted of at least \$100,000, the Society will name a portion of the gardens surrounding its headquarters in honor of the donor (or a person named by the donor). The garden area will be noted by a bronze plaque, and the area will be dedicated in a small ceremony with suitable publicity. Whether a gift meets the criteria for such a naming opportunity will be decided by the Executive Director in consultation with the Treasurer and Associate Treasurer.

The last sentence of the proposal is intended to cover situations when a gift has very minor restrictions (or when the precise amount is not easy to determine.)

A key virtue of this proposal is simplicity, which is often lacking in development.

John Ewing

To: Don Babbitt
From: Maria Lebron
Date: September 13, 2001
Subj: AMS Website Status Report - September 2000 - September 2001

New and Revised Products and Services on the AMS Website

The following AMS website offerings were either released or revised in the September 2000 through September 2001 timeframe:

September 2000: AMS Books Online

AMS Online Books were posted on the AMS website at http://www.ams.org/online_bks. A link was added from the Publications & Research Tools page. This is an experimental program of selected monographs from the AMS book publishing program; additional works will be posted on an ongoing basis.

September 2000: AMS Electronic Coversheet Service

A new service for applicants and employers, AMS Electronic Coversheet Service, was made available on the AMS website at <http://www.ams.org/coversheet>. Applicants can fill out a standard AMS coversheet online, add up to 3 supporting files, and have all stored in the database. Employers can search the applicant database and download results as delimited files. They can also download the applicants' supporting files. [In early 2001, a decision was made to discontinue this service.]

September 2000: Meeting Registration V3

Meeting Registration V3 was completed in September 2000, accommodating changes required by the CHER meetings and conferences system for file importing. (This revision has few visible changes for users.) The first form using Meeting Registration V3 was established for the New Orleans meeting.

October 2000: EENDR Survey

The annual Employment Experiences of New Doctoral Recipients (EENDR) Survey was made available online for the first time on the AMS website. Recent doctoral recipients were invited to respond to the survey. The URL is <http://www.ams.org/employment/eendr.html>

November 2000: MathSciNet V6

MathSciNet V6 was released in November 2000. Features included: a new Clipboard Feature allowing user to collect citations over multiple searches into one file; clearer navigation for MathSciNet results pages; a full list of journals to which MathSciNet provides links to original articles; author field split into two fields for improved search results; classification field split into two fields for more focused searches; journal searching improved to accept more abbreviated formats, more functionality added to the MathSciNet homepage; and translation information added to bibliographic data.

December 2000: New links from MathSciNet
Links from MathSciNet reviews to original articles in 10 journals from AIP and APS, as well as to articles in the American Journal of Mathematics were added in December 2000. New AIP/APS journals with links include: Chaos, J. Math Phys., and Phys. Rev. D. These journals added approximately 18K new links to MathSciNet, bringing the total of original article links to over 142,000.

January 2001: AMS Website Revamp
On January 3, 2001, the new e-MATH, organized based on "collections" of information rather than audience groups, was released. This was a significant redesign for AMS staff. In addition, the AMS began the process of phasing out the use of the name "e-MATH" in printed publications, promotions, and on the website itself. Instances of the word "e-MATH", are being placed with the phrase "the AMS website" (or "website of the AMS").

February 2001: Committee Nominations

March 2001: Donations to AMS
With the addition of this service, AMS website users have the ability to make donations to one of four different funds by credit card via the website at <http://www.ams.org/ams-donations>. The Epsilon, Centennial Fellowship and program Development fund pages contain links to the new donations page.

April 2001: AMS Employment Opportunities on the AMS Website
In April, Human Resources began posting AMS employment opportunities on the AMS website. A link is available from the "About the AMS" page to:
www.ams.org/ams/ams_jobs.html.

April 2001: New Shopping Cart And Dues Renewal Application
New AMS shopping cart and Dues Renewal web applications were released on the AMS Website, including changes for new AMS shipping and handling charges and the Reviewer (AMS) Points system.

May 2001: Moscow Math Journal
The AMS is distributing a sale-of-service journal on the web for the Independent University of Moscow. The first issue of the Moscow Mathematical Journal was launched in May 2001. This quarterly journal is available in pdf and print. The online journal is available without charge until 2002. You can see this new journal on www.ams.org/distribution/mmj

May 2001: Invited Speaker Form

A form was created to enable website users to suggest potential Invited Speaker at an AMS National or Sectional meeting (International meetings operate under different selection criteria). The form is available at: <http://www.ams.org/invited-nominate>

June 2001: Batch MR Lookup

The Batch version of MR Lookup, a citation matching tool enabling publishers to construct links to MSN reviews, was made available. Information about its use is available at:

http://www.ams.org/mrlookup-support/technical_help.html. Along with this release, additional linking information was made available from the AMS website Reference Tools page.

June 2001: EIMS Online

The EIMS Online system was enhanced to incorporate a delayed posting option, allowing institutions to submit an ad in time for a print issue but delay www activation until a specified date, as well as other improvements.

July 2001: MR Electronic Submissions V2

A new MR Electronic Review Submission application (Version 2) was released, including: a lower TeX error threshold, enabling more users to preview reviews; improved Help and FAQ files; improved error messages for users; migration of the distiller function from Sun102 to Odin/Loki; and incorporation of code design templates in the application.

August 2001: French Math Society Links

New MathSciNet original article links were recently added to the 4 journals of the French Mathematical Society: Asterisque, Bull. Soc. Math. France, M'em. Soc. Math. Fr. (N.S.), and Rev. Histoire Math. - bringing the total number of MSN original article links to over 163,000.

AMS Journal Archiving

This document reflects AMS journal archiving goals and current journal archiving procedures. This document describes archiving practices for: Proceedings, Transactions, Mathematics of Computation, Journal of the AMS, Electronic Research Announcements, Conformal Geometry and Dynamics, Representation Theory, and Bulletin of the AMS (1996-present).

AMS Journal Archive Goals

The goals of the AMS Journal Archive are:

- To preserve the content of every AMS journal article (including images, Java applets, etc.) maintained as well-structured, digital files;
- To ensure that all journal articles (1996-present) function in the current web product offering, always migrating all journals data (1996-present) to the most current web product;
- To periodically refresh all archived data to ensure continued accessibility by Society staff or other mathematical organizations as technology and products evolve;
- To replicate data at other locations to ensure availability in the event of a disaster; and
- To maintain instructions for the accessing and utilizing AMS journals data by Society staff or other mathematical organizations in the future.

Data is not intended to enable the AMS to recreate an *exact* replication of the printed product (i.e., print presentation). The overarching goal is to preserve the content and current functionality of every AMS Journal article in a digital format.

An escrow fund, currently valued at approximately \$200,000, has been established specifically for the purpose of ensuring that files will be converted to readable electronic formats.

Current AMS Journal Archiving Procedures

What is Maintained?

For archiving purposes, four (4) components are currently maintained for every AMS journal article (beginning with articles from 1996 issues through the present; see attached table):

- One (1) *TeX file* for the article
TeX files for AMS journals are currently created with LaTeX2e. Some earlier AMS journal files were created with LaTeX 2.09, AMS-LaTeX 1.0 or AMS-LaTeX 1.1, or AMS-TeX (only 1996). Linking information, if included in the article text by the author, is included in the TeX file for each article.
- One (1) *PDF file* for the article
PDF files for AMS journals are currently created with PDF 1.2 and Acrobat Distiller 3.0. PDF files for AMS journals include embedded Computer Modern and AMS Fonts. These

fonts are non-proprietary. For articles published as of the Journals Version 2 project (1999), links - including links to external sources supplied by authors and links to MR added in AMS production - are incorporated into PDF files using the HyperRef package.

Both the PDF and TeX files are static files. The PDF and TeX files created at the time of original AMS publication are the files that are archived; no changes are made to these files after publication. Neither the PDF or the TeX files are migrated to current production environments or software versions.

- One (1) *Gentag datafile* for each article
In 1999, the AMS created a Document Type Definition (DTD) for AMS journals, and then one datafile for each AMS journal article from 1996 to the present. The AMS journal DTD is a structured, tagged representation of AMS journal articles including elements such as author name, title, ISSN, URL, and many other elements. (References are included in the Gentag file, but are not tagged as individual elements; this will be addressed in the near future.) In addition, the Gentag file for each article includes a copy of the article stripped of all math and other TeX codes, for use specifically for database search purposes. The AMS DTD for journals is XML compliant. Gentag files are dynamic files, updated as necessary to reflect the current status of each article; only the most current version of the Gentag file is maintained for archival purposes.
- *All Images and ancillary files* associated with that article.

In addition, beginning this year, the AMS maintains one (1) additional file for each article:

- One (1) *SnapShot output file* for each article
SnapShot output files contain information describing the environment in which the article was created (i.e., the version of LaTeX used to create the article, etc.). See <http://www.ams.org/tex/snapshot.html>.

SnapShot files currently do not exist for AMS journal articles from 1996 to early 2001. AMS journal articles from 1996 to 2001 can be processed with the current TeX environment; therefore, SnapShot files for those articles can be created, seeded with current environment information. These SnapShot files allow the Society to create close approximations, not exact replicas, of the original published articles.

Software versions identified by SnapShot need to be archived by the AMS. The AMS maintains the current version of TeX/LaTeX used for journal production, as well as the previously used version, in an RCS version control environment. All AMS journal articles (1996-present) can be processed in the current TeX environment. Archiving of older versions of TeX software should be considered as the production environment changes. [CTAN (the Comprehensive TeX Archive Network, www.ctan.org) is a reputable public source of TeX materials; however, CTAN does not maintain archival versions of TeX software. The AMS does not rely on CTAN for obtaining older versions of TeX software.]

Comments:

DVI files are available, but are not recommended for archiving by the AMS. For files created between 1996 and the present, a close approximation to the original DVI file could be obtained using the current TeX environment and the archived TeX file. When the SnapShot output file and supporting software versions are maintained, the exact DVI file at the time of publication can be created.

PostScript files are also available, but are not being archived by the AMS. While PDF files could be created from PostScript files (if saved), PostScript files are much larger than PDF files. Therefore, based on file size, PDF files are maintained for archival purposes, not PostScript files. For files created between 1996 and the present, a close approximation to the original PostScript file can be created using the current TeX environment, the archived TeX file, and the DVI2PS process. When the SnapShot output file and supporting software versions are maintained, the exact PS file at the time of publication can be created.

Scripts used to create the current AMS Journals products (print and electronic) are maintained by the AMS. The AMS Journal Archiving program preserves all scripts necessary to create the current online and printed journal product offerings.

Where are Files Maintained and in What Formats?

The AMS Journal files are currently maintained on two (2) Digital Unix machines (AXP16 and e-MATH) in the Providence, RI office of the AMS (see attached table).

Archiving

AXP16 is the AMS Digital Unix production server. The files on AXP16 are active production files stored on SCSI disks. Files from AXP16 are passed to e-MATH to create the web version of AMS electronic journals. Files on AXP16 are considered the canonical source for AMS journal information. The AXP16 server resides in the Providence, RI office of the AMS in the computer room.

AMS production staff routinely transfer files from AXP16 to a VMS tape utility, PubArchive. An index of the contents of the PubArchive utility is maintained in VMS; PubArchive contents are sent to tape for perpetual storage. PubArchive tapes are stored in the Providence, RI office of the AMS (North Wing safe).

[PubArchive is a proprietary utility; a comparable version has not been identified for Unix environments.]

e-MATH is a Digital Unix machine which functions as the AMS webserver; files are also stored on SCSI disks. Files on e-MATH are accessed by AMS journal subscribers. Files on e-MATH are exact copies of the files available on AXP16. The e-MATH machine resides in the Providence, RI office of the AMS in the computer room.

While both AXP16 and e-MATH are currently Digital Unix systems, the AMS journal archive program is not dependent on Digital Unix. The intention is to preserve the data, not the presentation (web or print).

Disaster Recovery

The archiving of AMS journals data (reflected above) is done on two (2) machines (on live SCSI disks) in the Providence, RI office. In addition, for disaster recovery purposes, data from these machines is routinely transferred to tapes and stored in off-site locations, described below.

For disaster recovery purposes, AMS Journal files from both e-MATH and AXP16 are backed up to tape, and are included in a tape rotation program to 2 offsite locations (one tape is sent to Pawtucket, RI and another copy is sent to Ann Arbor, MI) (see attached). Tapes contain all AMS journals data from 1996 to the present, and reflect snapshots of the most current 6 weeks.

Disaster recovery tapes are in compressed DLT (Digital Linear Tape) format (specifically, AdvFS, Vdump format).

Tapes have an expected life of approximately 20 years. Tapes are routinely evaluated by AMS staff for viability, and old tapes removed from the backup rotation schedule.

As an additional precaution, the first full save tape from each month is maintained for one (1) year in the Providence, RI office of the AMS (in a fireproof safe in the North Wing of the AMS Providence office).

*Prepared by Wendy Bucci
August 16, 2001*

AMS Electronic Journal Archive Status
for PROC, TRAN, MCOM, JAMS, ERA, ECGD, ERT, BULL

Article Component	Availability	Location and Format of Archival Version	Location and Format of Backup Copy	Location and Format of Disaster Copies
Maintained by the AMS and Recommended for Archiving:				
TeX File for each article (static files)	1996 +	AXP16 (Digital Unix) as active production files in Providence, RI	e-MATH (Digital Unix) as live web-served files in Providence, RI	For ALL Content on e-MATH and AXP16: * One copy most recent full and daily incremental saves all journal files from 1996+ on DLT tapes in Providence. * One full save (from previous week) of all journal files from 1996+ on DLT tapes in Pawtucket, RI. * One full save (from previous week) of all journal files from 1996+ on DLT tapes at MR (Michigan). * The first full save from each month of all journal files from 1996+ on DLT tapes in Providence, RI for one year. (Disaster tapes MUST be restored to Digital Unix.)
	June 2000+		PubArchive Tape Utility (restored to VMS) in Providence, RI	
PDF File for each article (static files)	1996+	AXP16 (Digital Unix) as active production files in Providence, RI	e-MATH (Digital Unix) as live web-served files in Providence, RI	
Gentag File for each article (dynamic files)	1996 +	AXP16 (Digital Unix) as active production files in Providence, RI	e-MATH (Digital Unix) used to create web product in Providence, RI	
All Images and Ancillary Files for each article (static files)	1996+	AXP16 (Digital Unix) as active production files in Providence, RI	e-MATH (Digital Unix) used to create web product in Providence, RI	
Environment Info Files via SnapShot, file creation info (static files)	2001+	AXP16 (Digital Unix) as active production files in Providence, RI (proposed)		

Maintained by Aggregators (Additional Copies):

OCLC PDF File for each article	1996+	active files for searching only in Dublin, OH	
EBSCO PDF File for each article	1996+	active files for searching only Birmingham, AL	PDF files to MetaPress for searching only Birmingham, AL
Dawson PDF File for each article	1996+	active files for searching only in Carlsbad, CA	

Maintained by JSTOR (Additional Copies):

JSTOR - TIFF and ASCII files	through 1995	live webserved files	ascii files (no math) for searching only
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Available from AMS, But Not Recommended for Archiving:

PostScript File for each article	1996+		
DVI File for each article	1996+		
TeX Software	current environment		
Scripts to create products	current		

- * Files on AXP16 (a Digital Unix system) will soon be moved to a new machine, Sun07 (a new Sun Solaris system).
- * e-MATH (a Digital Unix System) will soon be migrated to new machines, Odin/Loki (Sun Solaris systems) in a redundant server configuration.
- * No changes are made to static files after original publication.
- * Dynamic files preserve only the most recent content.
- * DLT is Digital Linear Tape format.
- * Other aggregators include AMS journals (Swets and PubScience), but do not receive PDF files.
- * JSTOR is currently working with the AMS to explore migration of JSTOR data to XML format.

Twenty centuries of mathematics: Digitizing and disseminating the past mathematical literature

John Ewing, Executive Director, American Mathematical Society

"If you have built castles in the air, your work need not be lost; that is where they should be. Now put the foundations under them."

-Henry David Thoreau, *Walden*, Chap.18

Mathematics has always relied on its scholarly literature. From the time of Euclid's *Elements*¹ (about 350 BC), mathematics has thrived because key literature was passed from generation to generation. In modern times, the process has accelerated, changing the way mathematicians carry out research. Because it is impossible to study and digest all relevant literature in a broad area, mathematicians find themselves navigating the literature — moving from one paper or book to another, perusing results and proofs, and relying on references in order to link to the next item. The linking process has become more important as the literature has grown, and it is one of the reasons electronic publication has great potential benefit for mathematical research.

Reliance on past literature is common to all disciplines, but time scales differ. In some areas of science, literature more than a few years old has value mainly for historical reference. For mathematicians, work from ten or even one hundred years ago is relevant and useful in research. Like all scientists, working mathematicians will use and reference more recent work the most, but having the ability to access the older literature is of essential value to research mathematicians. Even when only a small fraction of the references come from literature in the distant past, those references may be the key to successful research.

As the scholarly community moves forward into the digital age, more and more of the current (and recent) literature will be available in electronic form online. The more that is available, the more the community will derive value from the ability to navigate easily from item to item². But for mathematics, navigation will have limited value as long as the bulk of the *past* literature is accessible only in paper form. In mathematics, making the past 20 centuries of scholarly literature available online can have a profound effect on research, both now and in the future.

This concept paper outlines a possible mechanism for making the past mathematical literature available online for everyone. It is a large project with many components and a number of potential difficulties. But in many respects it is a tractable project with a well-

¹ "No work, except the Bible, has been more widely used, edited, or studied, and probably no work has exercised a greater influence on scientific thinking. Over a thousand editions of Euclid's *Elements* have appeared since the first one printed in 1482, and for more than two millennia this work dominated all teaching of geometry." [Bell]

² Linking was a persistent theme at the recent Second UCSU-UNESCO International Conference on Electronic Publishing in Science, which took place in February 2001. The Proceedings will appear at <http://associnst.ox.ac.uk/~icsuinfo/> in the future.

defined goal and clear benefits to the research community. It is the sort of effort that might be undertaken in any discipline. On the other hand, mathematics is an ideal discipline in which to test such a project, both because it is relatively modest in size and because the need for digitizing the past literature is so clearly understood. The international mathematical community understands that need, which makes this suited for international cooperation as well.

For mathematics, this is a project that ties its past to its future in a way that is consistent with the present transition in scholarly publishing. It benefits everyone.

Overview

There are three goals for this project: (i) digitize a preponderance of scholarly mathematical literature that is not already in digital form, (ii) set technical standards for making digital mathematical literature accessible online, (iii) negotiate a protocol for making future digital mathematical literature available in the future. While many people will view the first goal as the essence of the project, achieving the other two goals is essential to make the project worthwhile.

The entire mathematical literature³ consists of approximately 50 million pages contained in books, journals, and various other publications. There are many ways to digitize the past literature (that is, literature that is not already in digital form), but the only cost effective way⁴ is to combine scanning with partial optical character recognition, creating a combination of scanned page image and associated text file (for searching). There is more to the process, of course. Relevant bibliographic data about each item must be captured (usually by keyboarding); items have to be studied and categorized to understand the various parts (articles, chapters, etc.); proofreading of critical data has to be carried out. Estimates for the cost of carrying out these steps in a large scale operation vary, but a rough approximation is \$2 per page⁵, making the total cost to digitize 50 million pages about \$100 million.

At the moment, a number of different projects are underway to digitize past scholarly literature. One of the first of these is JSTOR⁶, which provides complete runs of a collection of journals (including about 23 in the mathematical sciences) to institutions as a package. Several other groups are formulating projects to scan entire collections of journals⁷. Individuals are encouraged to scan and to make available their own papers and

³ The phrase "mathematical literature" is not defined precisely here, and this is one of the first difficulties mentioned below.

⁴ The term "cost effective" is relative, of course, but the alternative of keyboarding material would likely increase costs by a factor of 5, taking into account the basic bibliographic work that would still be necessary.

⁵ Other estimates have been made that are far lower (see, for example, **The economics of electronic journals**, A. M. Odlyzko. *First Monday* 2(8) (August 1997), <http://firstmonday.org/>, and *Journal of Electronic Publishing* 4(1) (September 1998), <http://www.press.umich.edu/jep/>.)

⁶ <http://www.jstor.org/about/>

⁷ The latest is a consortium of libraries together with the publisher Springer-Verlag, EMANI, but there are a number of other efforts underway in Europe—BNF, DIEPER, NUMDAM, etc.. Individual publishers, such as Elsevier, are already committed to creating their own collections of past literature in digital form.

books.⁸ All this coincides with the explosion of *recent* mathematical literature that has gone online in a great variety of digital forms (and which will become *past* literature in the near future). Many different groups, with many different formats, with many different interfaces. Almost all have the same goal — to make the mathematical literature accessible to mathematicians — but without coordination and standards the effort will flounder. Creating a basic set of standards for digital mathematical literature is essential in order to keep all these efforts from merely producing a Tower of Babel⁹.

The call for standards in electronic publishing is not new, and there have been many attempts to set standards for large communities of scholars.¹⁰ An attempt to negotiate standards in this project must necessarily take into account the work that has gone before, which has not always led to wide adoption. In this case, however, it is much more likely that adoption will spread throughout the community. The standards are aimed at a single discipline, and the project will focus attention on the need for standards.

Creating a collection of past literature requires that one update the collection in the future. Because this means dealing with individual publishers and organizations who disseminate the literature initially, and because the mathematical literature is especially diffuse, it is essential to outline a protocol for updating the collection over time. This will likely be different for books than for journals, and it may be only an ideal rather than an enforceable protocol¹¹. It is essential to attempt such negotiation, however.

One important aspect of the digitizing project is *missing* from this description — distribution of the material after the project is completed. Its absence is deliberate, and in fact, it is a key ingredient for the success of the project. While it is possible in principle to create complicated distribution arrangements that involve collecting fees, distributing these to publishers or even authors will almost surely burden the project with huge overhead costs. Negotiating these arrangements and maintaining them will consume much energy, which otherwise could be directed at carrying out the project itself.

Rather than complicated distribution arrangements negotiated by the project, the free market can provide ample distribution. The underlying philosophy of this project is to make the raw material available to the entire community, and then to encourage organizations (publishers, scientific societies, libraries, and other groups) to create a variety of mechanisms to access the material along with auxiliary indexing and organization. The raw material (bibliographic data, scanned images, associated text files, and other digital material) will be largely unstructured. Providing useful access to that material will require considerable effort, and neither grants nor a single organization can sustain that effort over long periods of time. But *many* organizations can sustain the effort

⁸ A recent call to authors, endorsed by the Executive Committee of the International Mathematical Union urges all mathematicians to create their own "collected works"; see <http://www.ams.org/ams/call.html>.

⁹ Genesis 11:1-9.

¹⁰ For one of the most famous, see <http://www.openarchives.org>.

¹¹ Currently, a window of 5 years has been proposed for journal articles; that is, publishers release their material to such projects after 5 years. For books, the time limit is much more difficult, and many publishers view books that are even 20 or more years old as valuable intellectual property.

indefinitely. Some will find ways to distribute the material as a service to the community; others will find ways to add value by indexing or adding other features, and they may charge for the service. All providers will promote their services, making access for the community easier and better suited to individual needs. The market approach guarantees that the material will be available in many ways, in many places, for many years. It also provides a robust mechanism for archiving, similar to the mechanism that has worked well for many years in the past.

Organization and timing

Administration of such a project requires more than volunteers and committees — it requires a small staff with central control of the many groups working on the project, perhaps distributed throughout the world. That staff may be under the administrative control of one or more existing organizations (to minimize overhead), but it needs to be dedicated solely to carrying out the project. While details are hard to specify in advance, there needs to be a director, administrative assistants, technical advisors, and legal consultants (see below)¹².

The job of the central staff is to administer and coordinate digitizing projects (either its own or those carried out by other groups), to oversee the work of various advisory committees, and to negotiate about permission to digitize and disseminate the final work. Carrying out this work will require a director with full responsibility for all aspects of the project, advised by committees but with considerable authority to act and to make independent decisions.

During the first phase of the project (likely 1-2 years), three committees will need to be established — content, technical, and advisory. The first will have responsibility to decide which material is to be included in the project. Its work will be ongoing throughout the duration of the project. The second will make decisions about technical standards both for the bulk of the project's work and for the community at large. Its work will be ongoing as well and will be closely connected with archiving (mentioned below). The third (smaller) committee should represent the mathematics community, providing overall advice on major decisions for the project. For example, this committee will have responsibility for establishing protocols for adding material to the collection in the future.

Work on digitizing older literature will continue for approximately 8 years following the initial 2-year period. During this time, material from the project will be made available to the various organizations disseminating it to the community, with the understanding that it will be added to their collections as soon as possible. Because several different groups may be involved in both funding and carrying out the work, quality control on the additional material will be coordinated by a central body under the authority of the central staff. When digital material is available from more than one source, the advisory committee will make decisions based on recommendations of the staff, as well as other considerations.

¹² Budget estimates are difficult to make at this level of detail, but a rough estimate is that total administrative cost will be approximately 20% of the total project cost.

As the main phase of the project continues, agreements about future additions to the project will be negotiated. Protocols for adding material will be adopted. A process for specifying and modifying standards will be put in place. The aim is to establish a system for ongoing oversight of the project by one or more organizations, with independent financial support for that oversight.

The overall goal of this project is to create a collection of material that represents "past" mathematical literature along with a mechanism for sustaining that collection and keeping it current. At the end of the ten-year period, this should be a system that is sustained by many organizations around the world, each with individual interests but with a common interest to foster mathematical research. Adding material to the collection will become a normal part of the publication process, made cost effective by standardization. Administering the collection will be small scale, and (one hopes) taken on by a small group of organizations¹³.

Major problems

There are four major problems in carrying out such a project and sustaining it once it is complete. Solving these will not be easy, but finding solutions will be essential to success. These four problems ought to be the central focus of initial planning.

(1) *Content*. Anyone involved in indexing mathematical literature (like *Mathematical Reviews* or *Zentralblatt*) recognizes the difficulty in selecting what should be included in such a collection. At *Mathematical Reviews*, approximately 110,000 items are considered for inclusion each year; only about 75,000 are actually added to the database. Deciding which to include is agonizingly difficult. The mathematical literature is far more diffuse than most people realize¹⁴. Not only are there hundreds of current journals, but many journals publish mathematics mixed with economics, psychology, physics, etc.. Deciding to include only full runs of journals means either that a large amount of the mathematical literature will be missed or that a large amount of the added material is not mathematics (in any sense). Deciding to include selections of articles from journals adds enormous editorial costs to the project.

The situation for books is even more complicated. Should one include textbooks? What level is appropriate? What about books that are at the boundary of mathematics and another area? Again, making individual decisions is enormously costly.

And for both kinds of material, making decisions is a highly charged, often political process (as any reviewing and indexing journal can attest.) What languages should be included? What if an item is known to have major errors? How are multiple editions handled? Are unpublished works included (and what is meant by "published work")?

¹³ Such administration can be patterned on the administrative efforts of other standards setting groups, such as the W3C organization. These function by soliciting modest donations from supporting organizations along with volunteer help.

¹⁴ *Mathematical Reviews* corresponds with thousands of sources for the material it reviews, and lists nearly 600 journals that are covered from cover to cover.

Deciding the content is far more complicated than asking a committee to decide which journals or publishers should be included — it is a process that requires careful thought in advance, and careful administration later in order to avoid massive additional costs.

(2) *Format*. Of course, setting standards for content that is *already* in digital form is a well known (if not well understood) problem. This will require hard work and substantial negotiation. But even the apparently simple problem of deciding the format of scanned material is extremely difficult. Not long ago, many people would have suggested using some form of compressed TIFF files encapsulated in Adobe PDF format. But, although PDF is widely supported at the moment, support for certain operating systems (Unix) has become problematic. More importantly, there are new, extremely effective formats for scanned images that reduce the size of files by a factor of 3-8 (or more). The most notable of these is DjVu¹⁵, a format developed at ATT Labs (using wavelets for superior compression and a progressive algorithm for decompressing images, presenting an immediate image that gradually improves). Although this requires special software to view the images within browsers, the technology is open source and the advantages over more traditional technology are considerable.

Selecting the right format — possibly a proprietary format — in an environment that is constantly changing, for a project that lasts over 10 years, producing a product that is intended to remain accessible for decades, is a nearly impossible task. This is closely connected with the fourth problem (archiving).

(3) *Copyright*. This is often misunderstood and underestimated by people thinking about such projects. When undertaking to digitize runs of journals from specific publishers, obtaining permission to digitize the work merely requires obtaining a handful of signed agreements from publishers (who are known in advance). In seeking to digitize an entire field, dealing with copyright issues requires understanding complicated legal issues (often with international copyright law, which is notoriously complex.) It means dealing with hundreds of publishers, many of whom are not easily identifiable (or who are no longer in business). It means dealing with thousands of authors or their heirs for the rights to reproduce books, which in many instances include material (for example, photos) with uncertain copyright status. This adds an enormous administrative cost to the project.

All this has been made far more difficult by recent changes in U.S. and international law. The magnitude of the problem is described in an article by Clifford Lynch¹⁶. In discussing the problem of scanning older literature, he writes:

The legalities of such conversions are a much more serious barrier, and one about which the public remains unaware. Roughly speaking, at least in the United States, any book published before the early 1920s is in the public domain (the details of precisely what is in the public domain are very complicated, and aren't

¹⁵ Extensive information can be found at <http://djvu.research.att.com/>.

¹⁶ *The Battle to Define the Future of the Book in the Digital World*, Clifford Lynch, http://firstmonday.org/issues/issue6_6/lynch/index.html

crucial here). If you can find a copy, you can scan it, or, if you are willing to pay the labor costs, you can even re-keyboard it with added structural markup into a more sophisticated digital representation. Whether you obtain a new copyright for your converted digital version of the work seems to be legally murky¹⁷, and seems to depend significantly on how much value you add in doing the conversion. This is important because it has implications for the availability of investment capital to convert public domain materials, and for how these materials need to be protected as they are made available, if they need to generate a revenue stream.¹⁸

Lynch goes on to say:

The cost of clearing rights for these works is likely to be hundreds of times greater than the costs of actually digitizing the works.

We can learn a great deal by examining projects that are already in place. JSTOR, for example, has a far easier task of dealing with legal issues because they negotiate with known publishers about complete runs of (usually) several journals at a time. Nonetheless, they expend a large amount of administrative time dealing with legal issues, and employ their own legal staff.

One possible response to the copyright problem is to decide only to include literature that is clearly in the public domain, or for which permission is easily obtained. A rough estimate indicates that more than 90% of the 50 million pages of mathematics remains under copyright. It is likely that half of this requires search and negotiation concerning copyright. Solving the copyright problem by ignoring it therefore requires a major compromise in the original goal of the project — to make a preponderance of the mathematical literature accessible.

(4) *Archiving*. This is not so much a problem for the project as it is for those sustaining the collection after the project is complete. Once again, it is a problem that is often misunderstood by people, including experts (precisely because there *are* no real experts in an area like digital archiving, where no one has much experience)¹⁹.

Until recently, there wasn't any need to consciously archive scholarly journals or books — archiving was (almost) automatic because many copies were distributed to institutions at various locations. One counted on the laws of probability to ensure that at least one copy would be extant years in the future. That one copy could be used to reproduce more copies at a time many years after initial publication.

Two things have changed with electronic publication. First, the copies may not be widely distributed, but rather often reside at one or two sites in electronic form. This is the

¹⁷ For example *The Bridgeman Art Library v Corel Corporation* (97 Civ.6232 (LAK) New York Southern District Court), case, which found that there was no new copyright in images of out-of-copyright artworks.

¹⁸ *The Battle to Define the Future of the Book in the Digital World*, Clifford Lynch, http://firstmonday.org/issues/issue6_6/lynch/index.html, page 16.

¹⁹ See for example <http://www.oclc.org/oclc/new/n226/ea.htm> .

problem of "robustness", and it's the issue most people think of when discussing archiving. Second, even if a copy of a file is extant many years in the future, it may not be possible to produce copies of the "work", that is, fully functional copies that are identical to those in existence years before. This is because electronic journals and books often consist of files embedded in a larger system that makes use of programs, auxiliary files, and even hardware to render the work. In short, the context in which the work is embedded is often essential to making a faithful copy, and archiving requires being able to reproduce that context. This is often referred to as the problem of "format", but the language makes it sound pedestrian, as if it were a word processor problem. It is, in fact, the central problem of archiving.

There are a number of simple schemes for ensuring robustness, including the simple device of replicating the multiple copies (just like paper). Because electronic media may degrade more rapidly than paper, however, there has to be an added step of routine replication to produce fresh copies. Fortunately, making electronic copies is far easier than making paper copies, which compensates partially for the extra step. Routine replication also addresses the problem of changing media, since a copy can move to whatever medium is currently in use.

One might hope that the format issue can be solved in a similar way — regularly change formats as new come along. There are two reasons this doesn't work. First, "changing formats" is *not* equivalent to making a copy. While making copies is routine and easily done for large volumes of material, changing formats requires special intervention, at least for a fraction of the material. The difficulties depend on the *old* format (something we know in advance) as well as the *new* (something unknown when we create the archive). Even if only a small fraction of the material needs special intervention by technical personnel, this can be enormously costly for a large collection. Those who deal with small personal collections often ignore this point.

There is a second, more subtle reason that changing formats is not a solution to the format problem. The format problem is more than merely preserving the format of a work; it is deciding what information about the environment in which a work is presented should be saved initially and then deciding at each subsequent stage of archiving what information is passed along. It is virtually impossible to save *every* piece of information about the environment. (For example, we likely rely on the ISO standards for recognizing characters and assume conventions about line feeds and returns²⁰.) Archiving requires decisions about *which* information will be necessary in the future, and those decisions must be made in the absence of detailed knowledge. Indeed, at the moment, and for some years to come, those decisions must be made without experience as well. There are many, many examples of incorrect decisions made in the past 20 years, resulting in lost work; there is no reason to believe we can avoid incorrect decisions in the future.

To sustain this project, one has to find a way to pay for the potentially large costs in updating the format in the future, as well as to make reasonable decisions about what

²⁰ <http://www.iso.ch/iso/en/ISOOnline.frontpage>

information to pass forward. Maintaining collections at many sites, each with either professional or financial interest in the material, ensures that a large group will want to share those large costs. It will be in everyone's interest to make certain that reliable decisions are made when formats change. Nonetheless, these are issues that extend over long periods of time (often exceeding the careers of individuals involved), and a mechanism needs to be established to guarantee that archiving issues are dealt with on a continuing basis.

Competition and cooperation

The great advantage of the approach described above is that it balances competition and cooperation effectively. The balance is essential for a project that is international in scope and that spans a decade or more to complete. And the balance is crucial to ensure the effort is sustained once the initial project is complete.

Rather than a few centralized institutions for dissemination of the material, the proposal calls for competition among many organizations to provide access in ways that address a variety of needs. Libraries, societies, universities, commercial publishers can all compete to add value for the community. This is healthy competition that provides incentives for many people to carry out the work and to sustain it in the future.

On the other hand, there are key areas in which cooperation is needed. Without uniform standards, access to large collections of digital material will be difficult or impossible. Without such standards, the kind of healthy competition above becomes impossible. And without standards, archiving the literature becomes enormously costly, possibly exceeding the resources of even a large group of interested parties.

Cooperation in all phases of this project can be made even more tangible by inviting representatives from many segments of the international mathematical community to serve on the various advisory committees. In addition, many countries have funds available for digitizing collections of scholarly literature. It is possible (and desirable) to divide the job of digitizing the older literature into several large collections, each of which can be done by a separate organization or country. This kind of cooperation, however, requires oversight from a central body, and it will be necessary to coordinate all work using a single body as indicated above.

Initial planning

This document is intended to describe a concept, providing only an outline of the scope of the project, a possible underlying philosophy, and the major issues one must resolve for successful completion. To carry out such a massive project, a small group of interested people (including potential international partners) must engage in far more detailed planning. That planning might be accomplished through a planning grant, administered by a single organization but involving representatives from institutions, libraries, scholarly societies, and publishers.

This project will revolutionize the way in which mathematicians conduct research — it is hard to imagine any single change that will have a greater influence. It remains a dream, of course, but an ideal dream on which to build foundations.

Families of Freedom Scholarship Fund

The Science and Engineering Scholarship Fund

A Scientific Society Initiative

In response to the tragedy of September 11, Citizens' Scholarship Foundation of America (CSFA) and the Lumina Foundation for Education partnered to create the Families of Freedom Scholarship Fund. Two weeks later, former President Bill Clinton and former Senate Majority Leader Bob Dole joined the cause and agreed to help raise \$100 million for the Fund. The purpose of the Families of Freedom Scholarship Fund is to help financially needy children and spouses of the victims of the terrorist attacks realize their educational goals.

In cooperation with leading scientific societies, CSFA has established a sub fund of the Families of Freedom Scholarship Fund called The Science and Engineering Scholarship Fund specifically for students who want to pursue a degree in science and engineering. The sub fund will benefit greatly from contributions as a result of broad advertising by the participating scientific societies.

FUND MANAGER

CSFA will manage the fund. It has developed a reputation as the nation's leading designer and manager of scholarship programs for corporations, associations, foundations and individuals. Founded in 1958, CSFA has been recognized for four consecutive years by the *Wall Street Journal's Smart Money* magazine as one of the nation's top ten nonprofits and the second most efficient education nonprofit. Since their founding, they have distributed over \$776.2 million to more than 748,000 students through its scholarship and other support programs. For more information, visit www.csfa.org

SCHOLARSHIP ELIGIBILITY

- Eligible participants will be financially needy dependents, including children and spouses, of those persons who died or are permanently disabled as a direct result of the attack and during rescue activities.
- Participants must plan to enroll in or be already enrolled in a course of study at an accredited two- or four-year college, university, or vocational-technical school based in the United States.
- In general terms, financial need is determined by what a family can afford compared to the cost of the postsecondary institution.

SCHOLARSHIP ASSISTANCE

- Individual education assistance amounts will be determined based on funds available.
- Financial need will be considered in determining the amount of each award.

- Depending on total funding available, education assistance may be renewable for up to three years for undergraduate study. Students must achieve satisfactory academic progress.

PROCESS

- CSFA will work with appropriate government agencies to compile a list of potentially eligible participants.
- The opportunity for education assistance will be communicated directly to victims' families as well as through news media, print, broadcast and electronic means.
- Once a master list is developed, CSFA will communicate annually with families to maintain contact to all eligible persons (spouses, young people and children) to ensure they know about the potential education assistance for postsecondary education.
- The effective starting date of the program is January 2002.
- Students may apply for education assistance as seniors in high school or in following years.
- Education assistance will be paid ordinarily in two installments each year. Checks are made payable jointly to the student and the school during periods of enrollment.

SPECIFICS OF THE SCIENCE AND ENGINEERING SCHOLARSHIP FUND
Funds contributed and designated for The Science and Engineering Scholarship Fund first are given to students interested in science and engineering fields. Thereafter, as additional funds remain, funds may be distributed to students interested in other fields of study, as defined in the Family of Freedom Scholarship fund general eligibility guidelines.

TO MAKE A DONATION

Tax-deductible donations can be made the following ways:

Online: Visit www.familiesofreedom.org and designate The Science and Engineering Scholarship Fund.

Phone: Call 1-800-335-1102 and designate The Science and Engineering Scholarship Fund

Checks: Make payable to Citizens' Scholarship Foundation of America, designating The Science and Engineering Scholarship Fund, and mail to CSFA, 1505 Riverview Road, P.O. Box 297, St. Peter, MN 56082

Non-income producing activities (NIPAs)

This is not a new topic. As a scientific society, the AMS provides services to the mathematics community, including both members and nonmembers around the world. We pay for those services using grants, dues, and (mainly) revenue from our publishing program. Because revenue is limited, we have to find ways to understand and to limit our expenditures on services. This is especially important in a membership organization because each constituency promotes their own special interests, and making decisions about which are to be supported can be both complicated and political.

For some years, we have tried to refine the annual budget reports to make expenditures on services easier to understand. Nonetheless, controlling such expenditures is not an easy process, at least when one tries to exercise control in certain ways.

At its recent meeting, the Committee on the Profession heard a report from a subcommittee charged with reviewing professional development activities of the Society. There were just two recommendations from the subcommittee, and one of them dealt with control of professional development activities of the AMS. Here is the item from the subcommittee report, in its entirety.

POLICY TOPIC 1: An explicit context for AMS professional development activities.

===

SETTING: The AMS engages in a rich variety of prof. development activities (see Appendix), mostly undertaken on an ad-hoc basis. It seems clear that these activities are richer and more effective than they would have been if policy committee involvement had been required, so we see no need for case-by-case oversight. On the other hand the sheer number seems to argue for a context in which to view the total effort and to provide mechanisms for the staff to use in deciding where AMS resources might be best used.

SUGGESTION: A budget should be established for support of professional development programs. Proposals for programs that require AMS resources should compete for shares of this budget. -- Thus projects like the Task Force for Excellence, Preparing Future Faculty, or the REU-related activities should either be fully funded externally (including overhead!) or should explicitly apply to this budget for unfunded expenses, including personnel time and travel.

DISCUSSION: To get started we might collect all current professional development activities, total their costs, and perhaps add a little to provide flexibility during startup. - A partial listing of recent AMS activities is provided in the Appendix.

- In the steady state, starting or expanding an activity would be balanced by reducing something else or by getting the Trustees and Council to increase the overall budget.

- Comparisons to justify budget share would help phase out less-effective programs, and ensure AMS resources are used in a cost-effective way.

At the meeting, I tried to explain why this approach doesn't work, at least not in this precise form. But since controlling NIPAs is a topic that arises in many contexts within the Society, and since it arises often, I thought it would be a good idea to carry on the discussion within the Long Range Planning Committee. What follows therefore is a synopsis of my notes at the meeting.

Accounting for NIPAs

Why is it hard to account for these kinds of projects? First, many of these projects are small. Holding a focus group for chairs at the Joint Meeting requires composing and sending invitations, keeping track of acceptances, and scheduling a room. Total cost? Perhaps something like \$500 of time and allocations. There are dozens of small projects like this carried out by staff.

Second, many projects are diffuse and ongoing. Someone may spend 15 minutes dealing with a problem for the Young Mathematicians Network, turn to write a letter for the book donation program, and then handle email from a participant in the Math in Moscow program. Accounting for each expenditure of time would entail enormous overhead, and likely be inaccurate in any case.

Third, much of the time devoted to such projects comes from the executive and managerial staff, dealing with issues that are not easily allocated to individual projects. When the Executive Director talks on the phone to the Director of the Washington Office about Preparing Future Faculty, it's almost always part of a broader conversation about many topics. Allocating the 10 minutes of time to PFF is both impractical and (most likely) imprecise.

Taken together, it is possible to estimate fairly accurately the cost of all such projects. Accounting for the cost of each individually is almost impossible, at least for the majority of small projects.

Normally this is not a problem—we try to estimate costs in order to understand how our various projects affect the entire program. But the idea of fixing a budget, proposing a list of projects with associated costs (including overhead), and then deciding which will fit within the budget each year is simply not practical.

An alternative method for limiting NIPAs

There is another practical problem with using budget alone to limit NIPAs. In general, we administer outreach and service through a handful of departments using a relatively small number of staff. Both the staff and the facilities supporting them make up a fixed set of resources available for various projects. Annual changes in the kinds of projects in which Society engages would almost surely mean shifting those resources — changing personnel, retraining people, buying equipment, etc.. While we can (and do) shift resources, it's expensive to do this annually;

in the real world, hiring and firing staff costs considerable amounts of money (unemployment, advertising, etc.).

Continually shifting resources also limits the flexibility that comes with stable resources. When we have a known department with people working on various projects, it is often possible to respond to needs quickly and efficiently. Suitable small projects can be done on the margin, using the time and talents of the personnel already employed (as is often done in Programs and Services). Other projects can be modified to fit into a template, similar to that used for projects already carried out (as is often done in the Washington Office). Projects and ideas that come up during the year can be evaluated and slipped into the flow of work, when there is room for them.

A sensible alternative for limiting NIPAs is therefore to begin with a fixed pool of resources — staff, facilities, and funds — and to determine which projects and programs can be done with those resources. (For the Society, this pool of resources consists largely of Programs and Services, the Washington Office, the Public Awareness Office, and a portion of the executive staff.) The process sounds similar to the proposal to fix a budget, but it is subtly different, and in an important way. The annual review considers whether the resources are adequate to carry out the desired program at a level that is suitable for its goals. Decisions about individual projects are made in multiple ways by many groups — policy committees, Council, ECBT, officers, staff — but always asking whether they can be carried out with available resources.

Limiting services and outreach in this way is not nearly as neat and tidy as using a fixed budget, and then packing an appropriate number of projects into that budget. It is, however, a lot more flexible ... and a lot more practical.

John Ewing

AMERICAN MATHEMATICAL SOCIETY
(Thousands of dollars)

SUMMARY	2000 ACTUAL			2001 BUDGET			2002 BUDGET		
	REV	EXP	NET	REV	EXP	NET	REV	EXP	NET
MEETINGS									
Short Courses	13	29	(16)	7	29	(22)	7	20	(13)
Book Exhibits	92	36	56	95	36	59	123	59	64
Joint Meetings - Winter	554	408	146	531	422	109	597	472	125
AMS Summer Meeting	88	181	(93)			-			-
Sectional Meetings	69	87	(18)	76	104	(28)	84	118	(34)
International Meetings		19	(19)		28	(28)		13	(13)
Other	2	11	(9)	2	14	(12)	3	11	(8)
Meetings Promotions			-			-			-
Meetings Sale of Service	97	107	(10)	83	105	(22)	101	136	(35)
Total	915	878	37	794	738	56	915	829	86

SERVICES AND OUTREACH									
Membership Promotions		52	(52)		67	(67)		41	(41)
Government Relations	7	372	(365)		423	(423)		430	(430)
Public Awareness		4	(4)		219	(219)		266	(266)
Fund Development	151	29	122	15	19	(4)	10	22	(12)
JPBM Support		49	(49)		12	(12)		10	(10)
Abstracts	45	30	15	43	28	15	39	28	11
Bulletin	217	145	72	213	156	57	212	149	63
EIMS	167	79	88	163	54	109	161	52	109
Notices	485	836	(351)	495	877	(382)	498	833	(335)
CML	72	68	4	53	43	10	67	69	(2)
Assistantships & Fellowships	45	23	22	47	22	25	46	26	20
Professional Directory	9	27	(18)	8	25	(17)	8	44	(36)
What's Happening	10		10	7		7	52	49	3
AMS Website		217	(217)		117	(117)		139	(139)
Tex Orders (Software)	1	26	(25)	2	25	(23)	1	25	(24)
Annual Survey	18	127	(109)	18	85	(67)	18	107	(89)
Other Survey Activities		7	(7)		28	(28)		17	(17)
Employment Register	45	74	(29)	45	73	(28)	46	96	(50)
Employment Services		84	(84)		10	(10)		2	(2)
Centennial Fellowship	163	163		163	163		171	171	
Other	3	88	(85)		53	(53)		36	(36)
Total	1,438	2,500	(1,062)	1,272	2,499	(1,227)	1,329	2,612	(1,283)

GRANT & ENDOWMENT SUPPORTED ACTIVITIES									
Stroock Publ Program	8	8	-			-	12	12	-
Prize Funds	44	44	-	52	53	(1)	67	68	(1)
Institutes	5		5			-			-
SRC's	238	244	(6)	261	268	(7)	213	213	-
Project NExT			-			-	20	20	-
NSF Fellowship Program	47	49	(2)	1	1	-	36	36	-
NSA Public Grants	54	65	(11)	66	52	14	68	68	-
AMS-MER Masters Wkshops	3	3	-			-			-
CPST Collaboration			-		2	(2)			-
Undergrad Research Exp.	6	19	(13)		3	(3)		3	(3)
UCLA Travel Grants	139	167	(28)			-			-
Excellence in Math	25	32	(7)			-			-
CBMS Survey	64	72	(8)	79	79	-	33	33	-
Non-Traditional Employment	2	2	-			-			-
Preparing Future Faculty	25	26	(1)	57	60	(3)			-
Young Scholars Programs	75	82	(7)	75	81	(6)	80	87	(7)
European Summer School			-	21	29	(8)			-
China Collaboration			-	4	4	-	18	22	(4)
Collaboration with Duke			-			-	20	18	2
Math in Moscow Grant			-			-	50	52	(2)
ICM Travel Grants			-		8	(8)	267	270	(3)
Misc Supported	6	10	(4)		2	(2)	1	2	(1)
Total	741	823	(82)	616	642	(26)	885	904	(19)

AMERICAN MATHEMATICAL SOCIETY
(Thousands of dollars)

	2000 ACTUAL			2001 BUDGET			2002 BUDGET		
	REV	EXP	NET	REV	EXP	NET	REV	EXP	NET
<u>GOVERNANCE</u>									
Officers		121	(121)		166	(166)		142	(142)
Office of the Secretary		148	(148)		170	(170)		166	(166)
Officers - Ballot		30	(30)		29	(29)		34	(34)
Comm Science Policy		14	(14)		21	(21)		21	(21)
Comm Mtgs/Conferences		9	(9)		9	(9)		11	(11)
Comm the Profession		10	(10)		11	(11)		12	(12)
Comm Education		15	(15)		15	(15)		20	(20)
Comm Publications		9	(9)		9	(9)		9	(9)
Various Committees		23	(23)		50	(50)		47	(47)
Total	-	379	(379)	-	480	(480)	-	462	(462)
<u>DIVISIONAL INDIRECT - MEMBERSHIP & PROFESSIONAL</u>									
Professional Programs & Services		145	(145)		238	(238)		291	(291)
Membership								378	(378)
Total		145	(145)	-	238	(238)		669	(669)
<u>DUES/SPENDABLE INCOME</u>									
Individual Dues	1,384		1,384	1,404		1,404	1,455		1,455
Institutional Dues	715		715	742		742	767		767
Total Dues	2,099		2,099	2,146		2,146	2,222		2,222
Spendable income from Supplemental ESF							608		608
Total Dues/Spendable Income	2,099		2,099	2,146		2,146	2,830		2,830
<u>MISCELLANEOUS</u>									
Mailing Lists	193		193	184		184	121		121
Video Tape Lectures	30	2	28	19	3	16	14	2	12
Various Accounts	9	317	(308)	16	167	(151)	5	218	(213)
Over/Under Allocated		8	(8)		14	(14)		328	(328)
Other Promotions	13	26	(13)	12	34	(22)	11	17	(6)
Temporary Investments	611		611	495		495	450		450
Total	856	353	503	726	218	508	601	565	36
<u>GENERAL & ADMIN</u>									
Executive Director Dept		665	(665)		641	(641)		648	(648)
Fiscal		671	(671)		917	(917)		813	(813)
Finance Director		242	(242)		325	(325)		488	(488)
Human Resources		297	(297)		363	(363)		356	(356)
Year 2000 Project		2	(2)		-			-	
Providence Administration		442	(442)		414	(414)		447	(447)
Total		2,319	(2,319)		2,660	(2,660)		2,752	(2,752)

Update on the Project to add Reference Lists and Forward Citations to the MR Database and MathSciNet

Current status

The release of Version 7 of MathSciNet in early September 2001 made available a major enhancement to the MR Database, the inclusion (for selected recent journal articles) of the full reference list from the original article together with links from items in the reference lists to the corresponding MR entry in MathSciNet. Moreover, those same links have enabled (selected) forward citations, a feature that many users of MathSciNet have called for.

The proposal to add reference lists and the associated forward citations was approved at the November 2000 ECBT meeting and a status report on the development of the project was given at the May 2001 meeting. Initially, the project is limited to 65 journals, selected by the MR editors with advice from the MR Editorial Committee. For issues of these journals from the year 2000 or later, MR staff make copies of the bibliographies from the individual articles and these are sent to Apex Data Services for capture in tagged electronic (XML) format. The tagged lists are then run through a sophisticated program (developed by the MR Systems group) to match the items with the corresponding entry in the MR Database. Both the data capture and the matching have proved to be extremely successful: the data capture is extraordinarily accurate and the matching rate is about 95% (despite the range of formats and errors in names, titles, paging, etc., that occur in references). The data capture and matching has been going on since the spring, and continues as new journal issues are received at the MR office.

Over the summer new MathSciNet screens were designed to accommodate the new type of data in the MR Database. On page 2 of this attachment are some screen shots to illustrate both the new full review screen and the backward and forward links that the addition of reference lists has enabled. In early September when reference lists first appeared in MathSciNet, over 5,500 items included reference lists. New reference lists are now added to MathSciNet each month; the reference list for a given item is added usually within two months of the item first appearing on MathSciNet. As more reference lists are added so the forward citations, throughout the MR Database, will grow. Analysis of the reference lists available in September showed that although references to recent items were more numerous than those to older items, the "half-life" of research mathematics is remarkably long. See the final page of this attachment for a graphical representation of this analysis.

Future plans

With the success of the pilot project to add reference lists from 65 journals for the year 2000 forward, it is now proposed to expand the project. There was debate at the recent MREC meeting (see Agenda Item 2.4) concerning the relative merits of expanding the project backwards (i.e. adding lists from earlier years of the selected journals) and expanding the number of journals covered. It was agreed that the addition of a few important journals that are not now covered might be considered, but that there would be great value in expanding backwards. The 2002 budget includes Apex costs (\$100,000) for the backwards expansion to cover the 1997–99 issues of the original 65 journals

Early in 2002, publishers will be invited to submit reference lists from their own journals themselves (in the required XML format developed with Apex). It is hoped that this will enlarge the scope of journals covered by the project considerably.

Example of item with reference list

[2001i:14024](#) [14F17](#) (14C20)
[Alexander, J.](#)(F-ANGR); [Hirschowitz, A.](#)(F-NICE)
An asymptotic vanishing theorem for generic unions of multiple points.
Invent. Math. **140** (2000), no. 2, 303--325.

[Article](#)

[References: 25](#) [Reference Citations: 4](#) [Review Citations: 1](#)

The present paper is devoted to proving an important asymptotic result concerning the generalized interpolation problem, i.e. the dimension of



Clicking on [References: 25](#) goes to reference list at bottom of review

9. K. Chandler. A brief proof of a maximal rank theorem for generic double points in projective space, preprint Notre-Dame 1997 of [CMP](#) [1813598](#).
10. A. Gimigliano: Our thin knowledge of fat points, in: Queen's papers in Pure and Applied Mathematics **83**, The Curves Seminar at Queen's, Vol. VI, Queen's University, Kingston, CA (1989) [MR 91a:14007](#)
11. B. Harbourne: The Geometry of rational surfaces and Hilbert functions of points in the plane. *Can. Math. Soc. Conf. Proc.* **6** (1986), 95--111 [MR 87k:14041](#)
12. B. Harbourne: Points in Good Position in \mathbb{P}^2 , in: Zero-dimensional Schemes, Proceedings of the International Conference held in Ravello, Italy, June 1992, De Gruyter, 1994 [MR 95m:14005](#)
13. A. Hirschowitz: La méthode d'Horace pour l'interpolation à plusieurs variables. *Manuscripta Math.* **50** (1985), 337--388 [MR 86j:14013](#)
14. A. Hirschowitz: Une conjecture pour la cohomologie des diviseurs sur les surfaces rationnelles génériques. *J. reine angew. Math.* **397** (1989), 208--213 [MR 90g:14021](#)
15. A. Jarrabona: Inverse systems of a symbolic power II: the Waring problem for forms. *J. of Algebra* **174** (1995), 1091--1110 [MR](#)



Clicking on review number of reference #10

[91a:14007](#) [14C25](#) (14C20)
[Gimigliano, Alessandro](#)
Our thin knowledge of fat points.
The Curves Seminar at Queen's, Vol. VI (Kingston, ON, 1989), Exp. No. B, 50 pp.,
[Queen's Papers in Pure and Appl. Math.](#), **83**,
Queen's Univ., Kingston, ON, 1989.

[References: 0](#) [Reference Citations: 3](#) [Review Citations: 2](#)

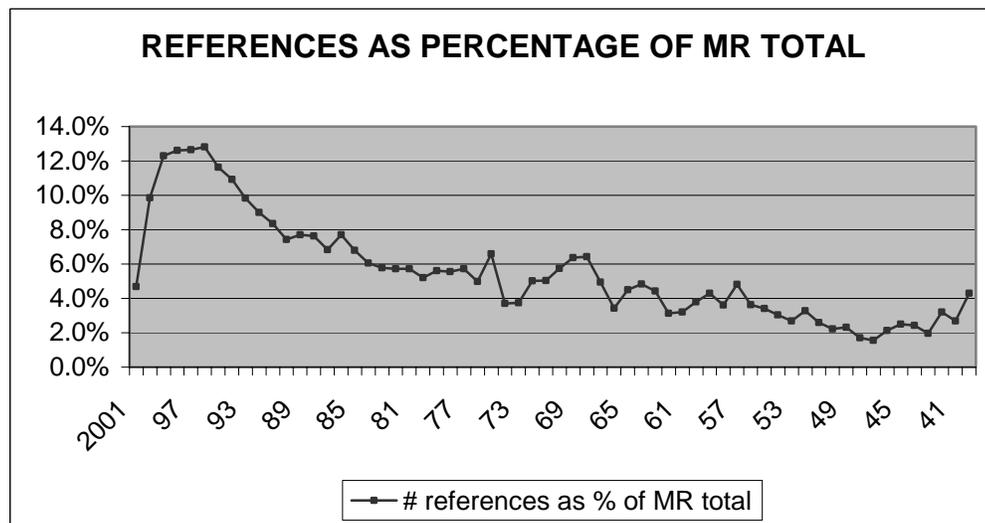
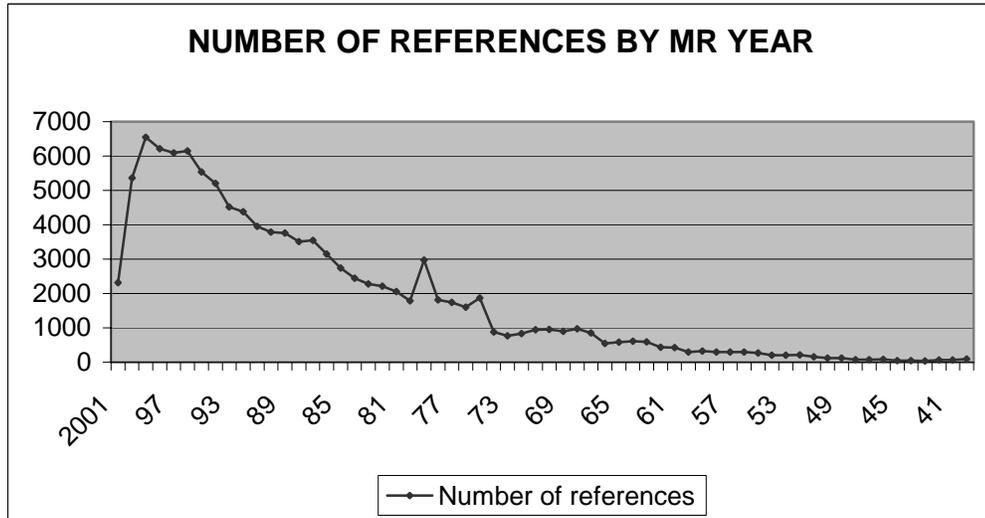


Clicking on [Reference Citations: 3](#)

[1] [2001i:14015](#) [Bauer, Thomas](#); [Di Rocco, Sandra](#); [Szemberg, Tomasz](#): Cyclic coverings and higher order embeddings of algebraic varieties. *Trans. Amer. Math. Soc.* **353** (2001), no. 3, 877--891. [14E20](#) (14E25)
[Review in linked PDF](#) | [Add citation to clipboard](#) | [Doc.Del](#) | [Article](#)

[2] [2001i:14024](#) [Alexander, J.](#); [Hirschowitz, A.](#): An asymptotic vanishing theorem for generic unions of multiple points. *Invent. Math.* **140** (2000), no. 2, 303--325. (Reviewer: [Ciro Ciliberto](#)) [14F17](#) (14C20)
[Review in linked PDF](#) | [Add citation to clipboard](#) | [Doc.Del](#) | [Article](#)

ANALYSIS OF REFERENCES IN MATHSCINET, SEPTEMBER 2001



AMS COMMITTEE ON EDUCATION
Meeting held Friday-Saturday, October 26-27, 2001, Washington DC

Summary Report

The involvement of professional mathematicians in K-12 education was the theme chosen for this meeting by CoE Chair Roger Howe. Despite difficult travel conditions, about 45 people attended the meeting. In addition to Committee members, invitees included several department chairs/leaders, Congressional staff, representatives from federal agencies and other mathematical organizations, plus a couple of young visitors (current and former graduate students). Over the course of busy two days the discussions ranged over the extent of AMS involvement in current mathematics education issues and initiatives. Roger Howe set the tone by noting that, as a result of recent CoE comments on the draft of the NAEP Mathematics Framework for 2004, presented by Herb Clemens at a recent public session, the committee has been invited to write introductions to three of the five subject areas in the Framework. CoE is currently working on the drafts.

Mathematics Publishing:

Representatives from publishers of mathematics textbooks (K-12) were for the first time invited to CoE. Pat Brill (Harcourt School Publishers) and Rosi Marshall (Scott Foresman) described how they worked with mathematicians in their projects, the kind of input they found most valuable, and some of the difficulties encountered. CoE members learned about the constraints under which textbook publishers work, and felt that the ensuing dialog was helpful in sharpening their understanding of the issues involved. A particular problem faced by publishers is the lack of uniformity of the various state standards that must be met, and they would be very grateful for whatever mathematicians could do to promote national standards. Brill and Marshall stayed for most of Friday's sessions and the dialog continued.

Andy Magid, who had represented CoE at a meeting of the American Association of Publishers, described his interactions with the representatives from the mostly large publishers in attendance.

National Science Foundation

Philippe Tondeur (DMS) and Dennis Davenport (EHR) described NSF education projects affecting mathematical sciences. Tondeur noted that NSF's FY2002 budget still working through Congress would end up with a respectable mathematics budget, in a not-very-good science budget. However, FY2003 will be massively affected by the September 11 attacks and the budget for mathematics will be hard to predict. Davenport gave details of the NSF initiatives offering funding for mathematics education projects.

U.S. Department of Education

Patricia O'Connell Ross reported that although there was still no FY2002 budget for the Department, the Administration has made it very clear that there will be substantially more money for education, and that the big focus will be on reading. Although the U.S.

culture works against any national standards, the federal government will be holding states accountable for Dept. of Education investment. The Department's most important research initiative is the Inter-agency Education Research Initiative (IERI), a cross-agency, cross-disciplinary, long-term approach to translate the findings of research projects and clinical trials into practice in large numbers of schools. Administered jointly with NSF and NIH (which has invested in reading research for many years, resulting in a knowledge base sufficiently robust to provide some confidence about what intervention works best) the portfolio currently has a majority of reading programs; very few mathematics proposals have been received.

The following day, Carole Lacampagne and Deborah Ball spoke on the progress of the Rand Mathematics Study Panel, whose draft report will soon be available on the Web. Roger Howe has also been involved in this panel, which had arisen out of the Department's concerns about the quality of research in education, and mathematics education in particular. Research was scattered, did not accumulate into a large research knowledge base, and, even when of high quality, did not translate into practice. What is proposed is a coordinated research agenda, focused on teaching and learning of algebra (broadly defined), identification and development of mathematical practices, the nature and uses of knowledge in mathematics teaching, and how such knowledge can be effectively deployed in practice. There was much discussion about this project, and CoE was asked to participate in refining the draft. Both CoE members and department chairs were asked to organize review groups to provide feedback.

Education Trust.

Concluding the K-12 segment of the agenda, Jan Somerville brought data on the cohort of students who are graduating from high school, and what seems to make a difference in their success. Those few places making large gains in graduating students are unequivocal that their goal is to raise the bar and provide all students with college preparatory courses. But in order to have a clear target, K-12 people are asking higher education institutions for some consensus on what it means to be "college ready" – what skills and knowledge are necessary to begin credit level work. Somerville is working with states to see if there are a few important things on which a consensus could be reached.

MAA project on the transition from school to college mathematics.

Bernard Madison is looking at issues at the boundary between school and college mathematics, noting that the fastest growing courses in high school are mathematics courses for college credit. The 2000 CBMS Survey is providing data on dual credit courses – 13.6 percent of college algebra courses are done in high school. Madison is also examining college placement exams and expectation statements.

Senator Joseph Lieberman's "Tech Talent Bill"

Kendra Sharp, a Congressional Fellow in Lieberman's office, said that this bill, recently introduced in Congress, aimed at increasing the number of science, mathematics and technology degrees by offering incentives to universities and colleges. To be

administered by NSF, grants would be made to institutions that propose to introduce innovative methods to increase, and retain, the number of majors. With bipartisan support, this bill has good prospects for approval in both Senate and House. A demonstration program would be funded initially, with the hope that it would grow and serve as an incentive to institutions to change behavior. Some concerns were expressed at the meeting about the danger of institutions increasing the numbers, but lowering standards.

Carnegie Project on the Doctorate.

Moving up the pipeline, the committee heard from George Walker about this project, the largest ever engaged in by the Carnegie Foundation. Noting that if one wants to change academic culture, one has to address the important role that the PhD plays. Disciplines are being asked to define “stewardship” in a disciplinary context, after which Carnegie will first work with four to six departments in each discipline to implement innovative, multi-department programs. After examining the results of these experiments, Carnegie will work to facilitate broad adoption of successful models. Walker asked CoE “What does stewardship entail for mathematics?” and “How do we structure a doctoral program to prepare stewards of the discipline?” Carnegie have commissioned essays from mathematicians (AMS President Hyman Bass has been asked to write one) and will organize discussion sessions at disciplinary society meetings and Carnegie-sponsored “convenings”.

Mathematical Education of Teachers.

Jim Lewis outlined the recent report “Mathematical Education of Teachers” (MET), the outcome of a CBMS project funded by the Dept. of Education. The report has been distributed to all mathematics departments, colleges of education, deans, and professional organizations. A national summit will be held in November, funded by Exxon and NSF, at which 270 participants are expected.

Alan Tucker spoke about an MAA project, “Preparing Faculty to Teach Teachers”, an outgrowth of the MET report. A planning grant had been received from Exxon. Tucker noted that mathematicians would be regressing to the norm by resuming their involvement in K-12 teaching that had fallen off in the second half of the 20th Century. A workshop will be held after the Joint Mathematics Meetings in January 2002. The group intends to organize workshops in states where regional follow-up meetings will be possible, and future articles are planned, along the lines of a recent one on outreach by John Conway, published in the *Notices of the AMS*. The aim of the project is to create a climate where faculty are more receptive to teacher education issues, are sensitive to the needs of prospective K-12 teachers, able to “deprogram” inculcated incorrect or negative ideas about mathematics and foster the correct ideas. Regional networks, web sites, mini-grants are also planned.

MAA Committee on the Undergraduate Program in Mathematics (CUPM).

Tom Rishel reported on work of CUPM and its subcommittee on calculus reform and the first two years of college (CRAFTY). CUPM has been working on recommendations for

the undergraduate mathematics and Rishel said the goal is to have a document ready this year. Recommendations have moved away from individual courses to broader recommendations on the critical skills (“habits of mind”) needed for mathematics majors. MAA will hire a professional writer to prepare the final version. Roger Howe noted that David Bressoud has been CoE’s representative to CUPM, participating in the work over the last few years. CoE will send a representative to a CUPM meeting at the August 2002 MathFest, which will produce a final draft report. CoE will then be called on to assemble a subgroup (ARG) to comment over fall and winter of 2002-2003 on the final draft. Rishel reported that CRAFTY has concentrated in the first two years of college mathematics, sponsoring workshops and discussion papers. A dissemination workshop will be held in November. Reports from various disciplines are available on the Web at [//academic.bowdoin.edu/faculty/B/barker/dissemination/Curriculum Foundations/](http://academic.bowdoin.edu/faculty/B/barker/dissemination/Curriculum%20Foundations/)

AMS-MAA Preparation of Future Faculty (PFF) project.

This three-year NSF-funded project ends in November, CoE heard about the experiences of participants from three of the four mathematics departments receiving PFF subawards: Arizona State University (graduate student); SUNY, Binghamton (former graduate student, now a faculty member at King’s College), and Virginia Tech (graduate coordinator). Each reported enthusiastically on the value of this program.

Mathematicians and Education Reform Forum.

Naomi Fisher reported that the AMS-MER Professional Master’s Program project would end in November, having conducted three workshops and created a directory of Master’s programs (soon to be available on the AMS website). A new 3-year AMS-MER project has received funding from NSF – *Excellence in Undergraduate Education: Confronting diverse student interests* – which will include six workshops for department teams.

CoE at San Diego Joint Mathematics Meetings, Jan. 2002

CoE will sponsor an address by Lee Stiff, President, National Council of Teachers of Mathematics, entitled “A conversation with the NCTM President – Facing the challenges of mathematics education together”. CoE Chair Roger Howe intends to prepare for thoughtful reactions to Stiff’s talk, to stimulate discussion. Date: Wednesday, January 9, 8:30 to 10:00 am.

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American Mathematical Society
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