Association for Women in Mathematics

PRESIDENT'S REPORT

I just returned from the Joint Summer Meetings in Columbus. It was an exciting week, which included the MAA's 75th Anniversary Celebration. As part of the celebrations, Judy Roitman gave a AWM-MAA joint invited address, and I sent a letter of congratulations to the MAA on behalf of the AWM which was mentioned at the MAA banquet.

The AWM program in Columbus was a busy and exciting one. First there was the panel on enrichment programs in urban public schools. The three panelists, Harvey Keynes (Minneapolis), Jacqueline Rivers (Boston), and Paul Sally (Chicago), all gave excellent presentations of the local efforts in which they are involved. After the panel I had the pleasure of introducing the Schafer prizewinners, Linda Green and Elizabeth Wilmer, as well as five of the ten recipients of honorable mention, Hope Concannon, Colleen Gallagher, Judy Leavitt, Natalie Rekittke, and Ileana Vasu. (Thanks go to all of the nominating institutions that covered their expenses.) Alice T. Schafer handed out the prizes and the certificates. It was a very exciting and moving experience for me to read aloud to the business meeting the accomplishments of these talented young women and to meet and speak with them later on at the AWM reception. They are all bright, motivated, and enthusiastic about mathematics. We would like to raise an additional $15,000 for the endowment to make the prize self-supporting. The citations I read at the prize session follow.

Linda Green was described as one of the top undergraduates in the Mathematics Department at Chicago in the last twenty-five years. She began taking graduate courses as a sophomore and has uniformly excelled in them. She also took the Putnam exam in her sophomore year, finishing in the top 100. In the summer of 1989, she participated in an NSF-sponsored Research Experience at Chicago studying harmonic analysis on local fields; her work was considered to be outstanding. Green has also, in conjunction with this NSF program, served as a counselor in the Mathematics Department's program for mathematically talented students from the Chicago Public Schools. Paul Sally, in his letter nominating her for the prize, said, "Linda Green is a truly impressive young woman who has all the talent and drive necessary to become an outstanding mathematician ..."

Being the first to win a mathematics prize is not a new experience to Elizabeth Wilmer; she was a major force behind the Harvard undergraduate math team which won the first SIAM mathematical modeling competition last year. She already showed great promise in high school when she came in second nationally in the Westinghouse Science Competition with a graph theory project and placed seventh on the American Olympiad team. Wilmer spent the Fall 1989 semester taking courses in Budapest where she was considered to be exceptionally talented. She also worked last summer at the NSF-REU program at the University of Minnesota and was asked to return. At Harvard, she has taken several graduate courses and has served as an undergraduate teaching assistant. "She is one of our real super-stars, who seems destined for a distinguished research career," said Benedict Gross in his letter nominating her for the prize.

In July, I attended the Society for Industrial and Applied Mathematics National Meeting, where I ran the first formal joint AWM-SIAM panel. The panel was on mathematics in industry and was a huge success. The room was filled to capacity, the talks by Rosemary Chang (Silicon Graphics), Linda Kaufman (AT&T Bell Labs), Marjorie Stein (U.S. Postal Service), Ann Stehney (CCR - Princeton), and Kathy Willis (Rennaissance Software) were first rate, and the feedback I got was uniformly positive. I hope this is just the beginning of a productive relationship between SIAM and the AWM.

Plans for our 20th Anniversary celebration at the Joint Mathematics Meetings in January in San Francisco continue to evolve. The technical program is very strong. First we will run a symposium called the Future of Women in Mathematics which will feature young women from a variety of mathematical fields within 10 years of their Ph.D. degree. The speakers who have accepted include Lynne Butler (Princeton University), Elise Cawley (City University of New York), Carolyn Dean (University of Michigan), Shafi Goldwasser (MIT), Bernadette Perrin-Riou (University of Paris), Jill Pipher (Brown University), Mei-Chi Shaw (Notre Dame), Laurette Tuckerman (University of Texas at Austin), and Ruth Williams (University of California, San Diego). This symposium is also part of a workshop we are running for graduate students and postdocs. More information on the workshop should be available in the fall. There will also be a joint AMS/AWM/MAA invited address given by Christel Rotthaus (Michigan State University) and a Noether Lecture by Alexandra Bellow (Northwestern University). Tricia Cross and Betty Ann Case are working on a great party, and we hope to organize a banquet too. Looks like we'll all be pretty busy. Another 20th Anniversary event will be a session in March at the American Association for the Advancement of Science (AAAS) meeting on Mathematics and Public Policy that is being organized by Beth Ruskai.

We had a busy Executive Committee meeting in Columbus. We established a membership committee, chaired by Sue Geller. Sue is looking for people to help her increase the membership base of AWM and also to begin an aggressive corporate membership campaign. The Executive Committee accepted the invitation of the Joint Committee on Women to become an official sponsor. We have been sending a representative to the meetings since the committee was formed, but through an oversight we were not actually a sponsor. A change to the bylaws was proposed to move the time of the change of officers from January 1 to the end of the January Joint Meeting. This makes more sense in terms of the running of the Executive Committee and business meetings. We will informally begin the practice this January, but the formal change wil require a vote of the membership next year.

Finally, the Executive Committee passed the following motion made by Rhonda Hughes:

> The Executive Committee of the Association for Women in Mathematics (AWM) establishes the Louise Hay Award for Contributions to Mathematics Education, to be given annually to a woman at the January Business Meeting beginning in January 1991. The purpose of this award is to recognize outstanding achievments in any area of mathematics education, to be interpreted in the broadest possible sense. The awardee will be selected by a committee appointed by the President and will receive a citation at the AWM Business Meeting.
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> While Louise Hay was widely recognized for her contributions to mathematical logic, and for her strong leadership as Head of the Department of Mathematics, Statistics, and Computer Science at the University of Illinois at Chicago, her devotion to students and her lifeling commitment to nurturing the tallentt of young women and men secure her reputation as a consumate educator. The annual presentation of this award is intended to highlight the importance of mathematics education, and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

It seems appropriate that we should honor outstanding educators as well as outstanding students, and what better time to announce the Hay Award than on the occasion of the MAA's 75th Anniversary.

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NSF-AWM TRAVEL GRANTS FOR WOMEN

The objective of the NSF-AWM Travel Grants is to enable women to attend research conferences in their field, thereby providing a valuable opportunity to advance women's research activities, as well as to increase the awareness that women are actively involved in research. If more women attend meetings, we increase the size of the pool from which speakers at subsequent meetings are drawn and thus address the problem of the absence of women speakers at many research conferences.

The Travel Grants. The grants will support travel and subsistence to a meeting or conference in the applicant's field of specialization. A maximum of $1000 for domestic travel and of $2000 for foreign travel will be applied.

Eligibility. Applicants must be women holding a doctorate in a field of research supported by the Division of Mathematical Sciences of the NSF (or have equivalent experience). A woman may not be awarded more than one grant in any two-year period and should not have available other sources of funding (except possibly partial institutional support).

Target Dates. There will be four award periods per year, with applications due November 1, February 1, May 1, and August 1.

Applicants should send a description of their current research and of how the proposed travel would benefit their program, a curriculum vita and a budget to Association for Women in Mathematics, Box 178, Wellesley College, Wellesley, MA 02181.

RUTH LYTTLE SATTER PRIZE IN MATHEMATICS

Joan Birman has endowed an AMS prize to be awarded in odd-numbered years to recognize an outstanding contribution to mathematics research by a woman in the previous five years. The first Satter Prize will be awarded at the Joint Mathematics Meetings in San Francisco in January, 1991.

In addition to Professor Birman, the prize committee consists of Linda Keen of Herbert H. Lehman College of the City University of New York (chair) and Karen Uhlenbeck of the University of Texas at Austin. The committee invites nominations from the mathematical sciences community for candidates for the prize. Nominations should include the candidate's name, affiliation, field of research, and a description of the work for which the prize would be awarded.

Please send nominations to Robert M. Fossum, Secretary of the AMS, Department of Mathematics, University of Illinois, 1409 W. Green Street, Urbana, IL 61801. Nominations must be received by September 30, 1990.

IN MEMORIAM

Boston Globe

Dr. Esther Comegys of North Hill, Needham, formerly of Wellesley and Natick, died April 19, 1990. She was 91.

Born and raised in Scranton, Pa., she graduated from Wellesley College in 1921 and later received a doctorate in mathematics from Radcliffe.

Dr. Comegys was a math professor at the University of Maine, Orono, for 21 years before retirement. She resumed teaching at Wellesley College for three years before retiring for a second time.

Added note: Esther volunteered in the AWM office until she could no longer see, helping get out large mailings and researching possible grantors for AWM.

New York Times

Dorothy B. Weeks, a physicist whose professional career spanned nearly six decades, died of a stroke [June 4, 1990]. She was 97.

From 1930 to 1956, except for two years during World War II, Dr. Weeks was a professor and head of the physics department at Wilson College in Chambersburg, Pa.

For six years after her retirement from Wilson, she coordinated a program at the U.S. Army's arsenal at Watertown, Mass., that developed radiological shielding materials for use against nuclear weapons, neutrons and gamma rays.

Leaving the Army's Materials Research Agency in 1964, she became a spectroscopist, studying solar satellites at the Harvard College Observatory. She retired in 1976 at the age of 83.

Dr. Weeks, a native of Philadelphia and a Phi Beta Kappa graduate of Wellesley College, went to work in 1917 as an assistant examiner for the U.S. Patent Office and, concurrently, an assistant at the National Bureau of Standards.

Later, she went into education, teaching physics at the Massachusetts Institute of Technology while she earned her master's degree.

In 1928, she began teaching physics at Wellesley while working toward a Ph.D. in mathematics at MIT, which she earned in 1930. She was the first woman to earn a mathematics Ph.D. at the university.

From 1943 to 1945, on leave from Wilson College, she was a technical aide at the U.S. Office of Scientific Research and Development.

In 1949 and 1950, back at Wilson, she was a Guggenheim Fellow.

AMS ELECTION STATEMENTS

All candidates announced in the June NOTICES for contested offices of the American Mathematical Society were invited to submit a statement in support of their candidacy for the *Newsletter*. Candidates named in July were also sent a letter, but too late for their responses to appear in this issue: please do not consider their lack of response a lack of interest. The letter sent to the candidates said:

Topics discussed in the past which you might wish to consider have included the following: the role of the AMS Council, promotion and tenure practices, the David report and its implications, and the lack of women speakers at public symposia.

A topic of special concern this year is the following: What can be done to attract more women, minority members, and disabled persons to mathematics? What should the A.M.S. do to attract more members of these underrepresented groups into the pipeline?

All responses to date are included below. Other responses will appear in the November/December issue. Also, consult the pink sheet that comes with your ballot for more information.

One vice-president will be elected. The Council has nominated Chandler Davis and Hans F. Weinberger. One trustee will be elected. The Council has nominated Jane Gilman and M. Susan Montgomery. Five members-at-large will be elected. The Council nominated David A. Cox, John M. Franks, Kunio Murasugi, Donald St. P. Richards, Lesley M. Sibner, Ruth J. Williams, and Lai-Sang Young. Steven H. Weintraub was nominated by petition. Three members of the nominating Committee are to be elected. President Browder has nominated Michael Aschbacher, Eric D. Bedford, Henri Gillet, Jerry Lawrence Kazden, Walter D. Neumann, and Stephen Wainger. (Aschbacher and Bedford did not receive initial letters). Two members of the Editorial Boards Committee will be elected. President Browder has nominated Jon F. Carlson, Richard J. Milgram, Stephen S. Shatz, and Nolan R. Wallach. (Milgram and Shatz did not receive initial letters.)

VICE PRESIDENT

Chandler Davis, University of Toronto

In 1969, a number of us supported a referendum in the AMS calling for several policy innovations — in particular a commitment to try to increase participation in mathematics by women and minorities. When this went out on the ballot, along with it went a statement from the Council, also to be voted on by the membership, declaring that non-mathematical issues had no place in the AMS. Our motions were swamped, while theirs sailed through. Shortly afterward, committees began to be set up for the implementation of the referenda which had been defeated! The joint Committee on Women in the Mathematical Sciences and the joint Committee on Opportunities in Mathematics for Underrepresented Minorities are still with us.

In 1988, a number of us supported a referendum for the AMS to encourage a larger non-military component in funding of mathematics, and to stay away completely from SDI. This time our

referendum passed by a large margin. Was any committee then set up to implement it? When the new Washington representative had to be picked this year, was it stated as a qualification that he or she must be prepared to carry out the new policy? Nothing of the sort. The officers of the AMS tried to act as though the membership had not spoken.

Ironic though this sequence of events is, the lesson may not be simple.

In the first episode, though the vote failed to prove it, I suppose the membership *was* for action against the white-male-only rule, and the then officers knew it and were willing to accommodate somewhat; they just weren't willing to do so in response to a popular vote, lest the members feel they had power in the Society, hence the steamrollering (successful) of the referendum. The two episodes together certainly demonstrate that a referendum isn't the key to everything. Formulating a policy and getting agreement on it doesn't do the trick. It's necessary also to elect officers who are ready to act on a policy.

Elections don't solve all problems either. We've elected Mary Gray, Bill Thurston, and other good people eager for improvements; they've worked hard and effectively; still problems remain. But having representatives in office who share your aims and will listen to you sure can help. AWM members have a record of voting, and paying attention to which candidates they voted for; many AWM members have also done outstanding work on Society committees; this has paid off, and it's worth continuing.

MEMBERS-AT-LARGE

David A. Cox, Amherst College

American mathematics needs to reach out to talented individuals in all levels and parts of society. We must find better ways of encouraging women and minorities to pursue the study of mathematics. This means that the AMS should be willing to address problems that arise in high school, college and graduate school. But getting more mathematicians isn't the only problem. We also need better support structures once someone joins the ranks of our profession. Federal funding of research mathematics should be restructured so that more of the many deserving people are supported. The AMS should play a more active role in encouraging the careers of young mathematicians, especially women and minorities. It is equally important to protect the research of people later in their careers.

John Franks, Northwestern University

The Society has a role to play in communicating the special nature of mathematics — its unique methodology and beauty — to the general public. Like knowledge of subatomic particles or the surface of Neptune, mathematical knowledge is an end in itself. Communicating this is an essential step in achieving two important goals of our profession: 1) the fostering of interest and participation in mathematics by talented youth, especially minorities and women, and 2) increased public support for both pure and applied mathematics research (especially support independent of any military mission).

Donald St. P. Richards, University of Virginia

I will work towards raising the visibility of mathematics education and research among the general public. As an example of a specific goal, I will try to obtain invitations to the White House for top placing teams in the annual Putnam competitions. It would be nice to see teams of aspiring young mathematicians visiting the White House; not only as a recognition of the team's efforts, but also for the importance such a symbolic event may hold for high school students.

Lesley M. Sibner, Polytechnic University of New York

I am clearly in agreement with the findings and suggestions of the recent David report as well as the previous 1984 report. As stated there, "the career path in the Mathematical Sciences" must be improved and every effort must be made to open the door to women and minorities. Bright students tend to go elsewhere in the scientific community when they see the lack of funding and support which exists in the Mathematical Sciences. We must somehow make an impression on the funding agencies

of the government in order to obtain more support for mathematics. If the Mathematical Sciences are not in a healthy state, then neither are the other sciences or the technical disciplines.

Steven H. Weintraub, Louisiana State University

The basic function of the Society is to advance the interests of mathematics (especially through its publications and meetings program) and mathematicians. Important are efforts to increase the representation of women and minorities in mathematics. The Society should be run in a more open and representative fashion, with members being better informed of issues facing the Council before they are decided, to enable them to communicate their views to the Council, and also being more fully informed of Council decisions. For my views on the proper relationship between mathematics and the military see the *Notices*, February 1987, pages 242-244. (While I certainly do not claim to have foreseen the geopolitical events of this past year, in their light the point I made in that statement about the foolishness of tying support for mathematics to something as volatile as the DOD budget seems especially well-taken.) Two recent changes in the AMS were prompted by suggestions from me: 1) that members can subscribe to Council agenda/minutes (this being related to the above-mentioned issue of communication between the Council and membership) and 2) the new program of sponsored memberships (see the *Notices*, December 1989, page 1372).

Ruth J. Williams, University of California at San Diego

I support the efforts of the AMS to encourage quality research and teaching in mathematics. Some issues that I see as immediate challenges to the AMS are the need (i) to attract talented students to pursue careers in mathematics, especially those from traditionally underrepresented groups; (ii) to foster interaction between mathematicians and other scientists who have an increasing need for mathematics and generate natural problems for mathematical research; (iii) to increase the average level of mathematical education of students in our schools; and (iv) to broaden the understanding and appreciation that the general public has of mathematics.

With regard to item (i), I think we can all help to enhance the environment for recruitment and development of young mathematicians, especially those from traditionally underrepresented groups. There are many ways in which we can do this, for example, by being role models, by taking a personal interest in our students and younger colleagues, and by actively participating in meetings and committees of the professional societies. To date, I have participated in such activities (a) by advising and encouraging those of my students and younger colleagues who show an interest and aptitude for mathematics and/or science, (b) through my position as an Associate Editor of the *Annals of Probability*, and (c) as an organizer of several conferences, where I have endeavoured to recruit speakers from traditionally underrepresented groups and ensured that information concerning the meetings reached all potentially interested parties. If elected to the AMS Council, I would strive to influence issues relating to the recruitment and retention of talented students and young postdocs on an even broader scale. In addition, I view such a position as a challenge to find creative and intelligent ways to address the issues that will face the AMS in the coming years. One such issue will be the influence of the Society on the uses and perceptions of mathematics by other scientists and the general public.

NOMINATING COMMITTEE

Henri Gillet, University of Illinois at Chicago

The job of the nominating committee should be to bring people with the interests of mathematics and mathematicians as a whole into leadership positions in the AMS; in particular these positions are not simply rewards for good research.

One of the critical issues facing us is the decline in the numbers of mathematics majors and the low numbers of graduate students, especially in pure mathematics. At the same time, women and minority students are underrepresented among students in mathematics and mathematics related programs. Thus, not only for reasons of equity, but also out of simple self interest, we need to increase the number of women and minorities who study mathematics. If one looks at the increasing numbers of women working in fields such as accounting and M.I.S., it is clear that even though our culture discourages women from entering mathematics and related fields from an early age, there are still

many women whom we should be able to recruit at the college level. Doing this will benefit mathematics and provide women graduates with improved technical skills.

Recruiting women and minorities involves both actively encouraging and assisting women and minorities taking mathematics courses, and also improving the mathematics curriculum to make it more interesting and attractive to students in general. We also need to continue to work on changing the conditions before college that either discourage women from, or make them unprepared for, studying mathematics at the college level. The A.M.S. has to continue and expand upon its leadership role in these areas.

The A.M.S. also has to pursue vigorously its "selling" of mathematics to the public, business, and government. This is important to ensure continued funding for research and education. It is also critical that mathematics be seen as an important subject when it comes to persuading women and minority students to take our courses. It will not help us in attracting women and minorities to mathematics if society does not value our subject and if our courses are unattractive.

Jerry L. Kazdan, University of Pennsylvania

The Nominating Committee should select candidates who have the ability and vision to advance all aspects of mathematics, in particular, research and teaching. At the same time, attention should be given to the support of mathematics by the community. The declining interest of younger American students in becoming mathematicians and declining governmental support of mathematics are both issues of great concern. As part of this it is vital that we attempt to attract women, minority members, and disabled persons to mathematics. These are complicated issues that merit serious attention and concerted effort for a number of years. They should not be viewed as short term problems that can be fixed quickly.

Walter D. Neumann, Ohio State University

The issues facing our profession include the seriously declining number of students interested in entering it, our own narrowing view of it (as Feynman says in his memoirs, 50 years ago A. Einstein was a mathematician, and few people knew what a physicist did!), shifts of emphasis of federal funding, continuing problems in pre-university education, the continuing failure to increase the proportion of women and minorities, etc.

On the latter: the situation for minorities in the profession has improved (though not yet ideal), but the lack of a broad and honest commitment to affirmative action in academia still helps to limit the gradient of the number of minorities entering the profession. Many people have written about the importance of role models in their own careers, but a large part of the academic community still chooses to consider this irrelevant.

The Nominating Committee of the AMS has limited means to address the above issues. It makes no policy: it can only seek candidates with experience, judgement, and vision to deal with them. It can also actively seek minority candidates with these qualities.

EDITORIAL BOARDS COMMITTEE

Jon F. Carlson, University of Georgia

I strongly support efforts to attract women and members of other minorities to the field of mathematics. I believe that, for the most part, the burden of achieving a greater representation from minority groups rests with the instructors in the undergraduate and lower-level graduate courses in our universities. The future of mathematics in the U.S. will be greatly determined by the success of our efforts to excite students and to convey to them the joy and love of the subject. Our national societies such as the AMS should continue to encourage greater participation from underrepresented groups by inviting their members to speak at meetings and serve on committees when appropriate. The societies should use their influence to promote and develop resources for the education of mathematicians from these groups. In the end, however, it remains the responsibility of the academic community to nurture and develop young mathematicians from all segments of our population.

TRUSTEE

Jane Gilman, Rutgers University

Overview: The main goal of the AMS is to promote research, which it does primarily through its meetings and publications. The society also speaks for the profession to outsiders and in this role it addresses issues that bear on its main goal. Of current concern are appropriate levels of research funding and research opportunities, a projected shortage of mathematicians, and serious problems in mathematics education. The AMS should encourage and support studies such as the David report, its sequel, and the work of MS 2000, which analyze problems and recommend solutions; and then it should work to implement those recommendations which are appropriate. The society should consider speaking more forcefully on some issues. For example, it could give non-mathematical portions of the academic ommunity (i.e. deans, other administrators, and scholars in other disciplines) more guidance in how best to support a assess mathematical research.

Specific issue: The AWM has suggested that candidates give particular attention to the questions "What can be done to attract more women, minority members and disabled persons to mathematics? What should the AMS do to attract more members of these underrepresented groups into the pipeline?" Attracting more members of the underrepresented groups is part of the problem of attracting more people in general to mathematics. This is intimately connected with the serious problems we face in mathematics education. These do not have a simple solution. It will take a concerted effort and a number of different initiatives by many different individuals and groups to solve the problems. Not all of the initiatives will be successful. The AMS has already begun to be involved in some initiatives and should expand its involvement. While improving mathematics instruction wll bring more people into the pipeline, educators and members of the AMS must constantly be sensitive to the special needs of the underrepresented groups in the pipeline and make special efforts to encourage them.

Susan Montgomery, University of Southern California

First, I'd like to repeat my statement for the AMS: If elected I will continue to carry out the responsibilities of a trustee, namely to oversee the financial affairs of the Society. Over the next several years, a number of important issues will be considered by the trustees, such as: the growing involvement of the society in education, including encouraging more young people to go into mathematics; the desire to support more mid-career mathematicians, by increasing the number of AMS fellowships and/or by beginning a program of small travel awards; continuing the recent remarkable growth of the publication program; and finally, addressing the serious space needs of the Providence office - the possibility of moving to a larger building, perhaps even to another city such as Washington DC must be considered. Hopefully a way can be found to fund these various projects (perhaps through a development program) while maintaining the long-term financial health of the Society.

Second, some comments for the AWM. It may not be appropriate for a trustee to express policy opinions, since according to the AMS structure, scientific policy is the responsibility of the concil and its various committees. The trustees are more reactive than active in this respect. Nevertheless I have always supported encouraging more women in mathematics, and during my present term as trustee have voted in favor of establishing the Satter Prize for outstanding research by a woman and also in favor of a donation to the AWM to help fund the Schafer Prize for undergraduate women.

AWM DUES AND DATABASE

We would like to remind you to submit your dues, which are due October 1st. Consider becoming a contributing member. Encourage students (only $5 for them) and colleagues to join. It would be great if everyone could get their institution to join; there are three types of institutional memberships, with varying privileges, including free ads and free memberships for students. See your dues statement or the back page of the *Newsletter* for the rates.

Also, we would like to encourage everyone to fill in the renewal form completely. This information will be entered into AWM's new database, which should streamline office operations for us a good deal. Also, the *AWM Directory of Women in the Mathematical Sciences* and the AWM Speaker's Bureau listing will be much easier to maintain.

AWARDS AND HONORS

Professor Jeanne L. Agnew, Oklahoma State University, Stillwater, received the 1989 Meritorious Service Award of the Oklahoma-Arkansas Section of the Mathematics Association of America. Congratulations!

Professor Agnew received her doctorate from Harvard University and completed her thesis under the supervision of G. D. Birkhoff. Professor Agnew's professional career is always developing. Since the middle 1970s, applied mathematics curricular materials have interested her. She wrote the materials in two NSF funded projects — "Problems from Regional Industries for Undergraduate Majors" and "The Development of an Undergraduate Educational Applied Mathematics Component with Cooperation from Regional Industries." She advised the Teaching Experiential Applied Mathematics project (TEAM) and served as Coordinator of Written Materials for the Applications in Mathematics project (AIM). Nationwide, students and teachers have enthusiastically welcomed these MAA projects.

In 1984, the Section named Professor Agnew its Twelfth N. A. Court Lecturer — the highest honor the Section bestows. She continues to contribute to the general mathematics community and, in particular, to the Oklahoma-Arkansas Section.

Congratulations to Maria Elizabeth Go Ong, Applied Mathematics Department, University of Washington, who received one of two Householder prizes for the best thesis in numerical linear algebra submitted in the previous three years. Her thesis, "Hierarchical Basis Preconditioners for Second Order Elliptic Problems in Three Dimensions," was written under the direction of Loyce Adams, the only previous woman winner of this triennial prize.

Thelma E. Bradford, A. & T. State University, Greensboro, NC, has received an award from the Internal Revenue Service for twenty-five years of "caring for neighbors, community and country by volunteering services to its Volunteer and Education Programs." Also, she has received an award from Tougaloo College in appreciation for outstanding service. Congratulations!

SATs RATIFY WHITE MALE PRIVILEGE

Dr. Steven Goldberg's "Numbers Don't Lie" uses the 60 point difference in SATs to argue that men are superior to women in mathematical reasoning. Yet journalist and researcher David Owen (*None of the Above*, 1985) brings clear evidence that the difference results from the test itself. The SAT has been and continues to be manipulated to reflect the gender/race biases that started with its creator, noted eugenicist Carl Campbell Brigham. Owen shows how new SATs are honed so that they agree or conform with *past* SATs in their prediction patterns for groups in society: white males vs. white females, rich vs. poor, whites vs. non-whites. The preferred group is, and always has been, middle- and upper- class white males. For them, the test has been changed, question content distorted, and question form fixed to insure that their presumed superiority shows in the scores.

Carol A. Dwyer, a researcher for the Educational Testing Service (ETS) which produces the SAT, analyzed the manipulations of content in the verbal SAT in the early 70s. She undertook this after Thomas F. Dolan of ETS had concluded that "The ... 40 point difference between the sexes [in math] ... is, at least in part, a function of the test specifications" and that it could be "*raised or lowered twenty points by manipulating subject matter and question form.*" Dwyer describes changes to "balance" male/female scores in the verbal SAT, which in fact led to higher scores for males. She admits this is "probably an unconscious form of sexism" for, she asserts, ETS has never seen any need to "balance" math scores — which favor boys. That lead is simply presumed right.

Indeed, it is generally assumed ETS did not alter the math test so as to "balance" the disparity. Probably not, for the spread rose the predicted 20 possible points in math, at about the same time that the verbal test was fixed to show an advantage for males.

Research also shows that the SAT's dominant question form (multiple choice) disadvantages white women, blacks, Hispanics, and Asians, and that its main false-lead device, the homograph (spelled alike/different meanings), highly penalizes Asians, Hispanics, and blacks, in that order.

So we have a test that has been "balanced" to show higher scores for the preferred group, which is bad in itself. Far worse is the fact that the much-touted 60 point difference is meaningless. According to ETS's *ATP Guide for High Schools and Colleges*, verbal score differences under 70 points and math under 80 are meaningless because they are the standard error of difference for the SATs. As with Dr. Goldberg's height and weight analogies in this case, *numbers do lie*.

Dr. Goldberg has appalling faith in the ability of crude and suspect measurements to identify innately inferior groups. He would have us accept 60 points as proof of innate superior ability and restore our intellectual resources to rightly illegalized distribution procedures for scholarships!

Goldberg argues that the only reason that SATs seem to underpredict women's college grades is that females take fewer math and science courses. In 1987 M.I.T. changed its admissions policies. It found that, despite lower MSAT scores, women earn grades in math and science equal to men. This study corroborates many other independent studies showing that SATs do not predict college achievement in math and science.

Nor do SATs "equalize quality differences in high schools," which implies the test weeds out social factors in gauging innate ability. Students from private and well-heeled public schools with smaller classes, better qualified teachers, and better books and equipment, do better on the SAT. They are not only taught more, they are also coached by their schools usually for both PSATs *and* SATs.

If that isn't enough, such students can buy more coaching to lift their "innate abilities" by however much they can "innately" afford.

The most expensive coaching costs roughly a year's tuition at CCNY. The Princeton Review routinely raises SAT scores from 185 to 250 points, teaches students to solve quantitative comparison items (math) without always even reading the entire item, and insists its clients guess. Stanley Kaplan's less costly courses can raise scores more than 100 points. In contrast, poor students, often Blacks and Hispanics — which means the women and men in the majority at CCNY — can get instructions from ETS, states Owen, which discourage guessing and indicate it is possible to raise one's score "as high as 25 or 30 points." That is the free help from ETS. So much for equalizing differences.

The best data on performance in students with truly comparable preparation comes from an analysis of Princeton Review students, very well-to-do clients attending elite schools, who were highly valued regardless of race or gender. This study, done in 1988, found a 1 point male lead on the VSAT and a 35 point male lead on the MSAT: male total, 1061; female, 1025. No significant statistical difference between white and black students in this elitist group was detected, though the sample is not definitive. Still, given comparable training, strong environmental reinforcement, and identical coaching, statistical differences seem to have all but disappeared.

SATs have doubtful predictive value and questionable form and content, as independent research demonstrates. They also narrow our concept of human intelligence by placing a false premium on one kind of intelligence at the expense of other kinds. The corollary of this is the denigration of college courses other than maths and sciences. SATs reward facile or glib reactions and conventional values. SATs penalize thoughtfulness and originality. High SAT scores prove that students do well on SATs; low ones, that they don't: little more — expect perhaps that such pseudo-data is dangerous in the hands of the gullible and/or the unscrupulous.

Maybe science will someday identify gender or even racial differences in brain capacity or quality of mentation. But reputable scientists admit they cannot tell what differences in spatial perception, for example, really mean in complex human endeavors. Therefore, until our social structures become optimally neutral on gender/race issues and truly nonhostile to all groups within society, we cannot afford to trust alleged proofs that X or Z is innately superior to B or F! For we know a very great deal about the potency of belief systems: we know how to condition students to fulfill our expectations that they will succeed or that they will fail. This we call a self-fulfilling prophecy, not as arcane as the mathematics of Riemann surfaces, but indispensable for dealings between gender and racial groups.

What we know suggests compellingly that we would do well as a nation, and individually, to repudiate seductively self-serving prejudices about the innate superiority of any group over another.

LETTER

Claudia Zaslavsky sent this letter to the IBM Gallery of Science and Art, New York, NY.

Dear Friends:

Many years ago, when I was teaching secondary school mathematics, I received a copy of the IBM History Wall Chart. Although the chart was a valuable addition to my lessons, I was disappointed to find only one woman, Emmy Noether, represented in the history of mathematics from the twelfth to the twentieth centuries. Furthermore, she was treated less respectfully than were the male mathematicians.

I know that many people protested, and the chart was revised in 1975. When I learned that your gallery was again presenting the exhibit "MATHEMATICA, A World of Numbers and Beyond," I went to see it a few weeks ago. Of course, I looked at the wall chart to see how it had been revised, and this is what I found. Emmy Noether's biography had been revised; one could see that a revision had been pasted over the original text. She is described as "one of the world's greatest mathematicians." The biography continues: "She was the first woman in modern times to acheive [sic] distinction in mathematics of the very highest rank." All well and good, except for the misspelling.

But when I read the section about her achievement, I was appalled to see that she is still called "Emmy," just as in the unrevised version to which we had objected. Not "Emmy Noether" or even "Noether," as the male mathematicians were addressed, but just plain "Emmy"! The same lack of respect is still there.

I shall look forward to your comments on this matter.

EDUCATION COMMITTEE COLUMN: A Report from New Jersey

Sally I. Lipsey, chair
Geraldine Taiani (Pace College, NY), a member of our education committee,
has sent us the following news from the state in which she lives.

Classes for Parents and Children: Family Math

Family Math is a program of after-school classes for parents and children (jointly) by grade-level. The material is based on the standard curriculum with an emphasis on problem solving. Family math teaches many games and projects which can be done at home. To start a Family Math program, a school district sends a "trainer" to a "trainer workshop," conducted by the Consortium for Educational Equity (Arlene S. Chasek, director) of Rutgers University.

Presentations to Motivate Young Women

WAM (Women and Mathematics) is a national organization with regional coordinators in several states, including New Jersey. WAM's program consists of informal talks, by women in mathematicaly related fields, to students, parents, teachers, guidance counselors, and/or curriculum directors at the secondary school level. The goal is to stimulate interest in mathematics among all students and to help motivate especially able students towards careers in mathematics, science, and technology. The regional coordinator of WAM is Dr. Mary R. Hesselgrave (AT&T Bell Laboratories).

Futures Unlimited is a one-day program for 7th to 10th grade female students, conducted by the Consortium for Educational Equity (mentioned earlier). The program is designed to encourage the students to take as much mathematics as possible throughout high school in order to keep open as many career options as possible and to expose them to a variety of math/science/business/computer careers. Presently, this conference is conducted once a year at Burlington County College (Connie Churchill, coordinator) for about 250 young women; it is organized into large-group sessions, small-group sessions, and "hands-on" workshops. During the small-group sessions, participants meet with women who work in mathematically related fields.

The Network of Stevens Institute of Technology provides presentations at area high schools featuring successful women in fields of math and science. For 8th grade girls, there is a presentation emphasizing the importance of the high school math curriculum. Arrangements are made by Patricia K. Bailey (Office of Women's Programs) at Stevens Institute.

Summer Program for Talented Students

The Douglass Science Institute, run by Douglass College (Dr. Dale Kennedy, coordinator), is a two-week residential summer program for 10th grade girls. The program provides lab activities in sciences and formal sessions in math and computer science. There are also career panels and field trips.

A month-long residential program, ECOES (Exploring Career Options in Engineering and Science) is conducted by Stevens Institute (Patricia K. Bailey, coordinator). Eleventh grade female students do two research projects in engineering or science and have opportunities for career exploration.

Rutgers Summer Program in Discrete Mathematics (Joan Fox, Administrative Assistant) is a one-month program for talented 11th and 12th graders, boys as well as girls.

Programs to Improve the Teaching of Mathematics

PRIMES (Project for Resourceful Instruction of Mathematics in Elementary Schools, Pat Kenschaft, Montclair State College, project director) is designed to enable teachers to be more successful and interesting. School districts send teachers, called "fellows," to a year-long PRIMES program whose goals are to (a) expand their perceptions of mathematics; (b) assist in developing creative instructional approaches; (c) prepare "fellows" to share their expertise with colleagues; and (d) stimulate informed networking.

PRISM (Partnership for Radical Improvement of School Mathematics, Larry Wiley, New Jersey State Department of Education, coordinator) will work through school districts, initially establishing a consortium of 20 to 30 such districts. Each district must commit to working with the New Jersey State Department of Education for five years. When fully operational, the consortium is expected to serve as a model for reform in mathematics education throughout New Jersey from kindergarten through eighth grade. Goals of PRISM include (a) new emphases in the curriculum on problem-solving, reasoning, and real applications; (b) training teachers to understand mathematics better and to teach a "hands-on" course; and (c) an increased amount of classroom time devoted to math.

The Center for Mathematics, Science and Computer Education of Rutgers University (Joan Fox, Administrative Assistant) has created a new K-8 mathematics curriculum which is now being used in the New Brunswick elementary schools. The Center can also evaluate other New Jersey school programs and give recommendations for improvement. In addition, summer programs conducted by the Center provide teachers with in-service training in both mathematics and pedagogy. These programs vary from year to year; they focus on such topics as probability and statistics, or methods of teaching precalculus, and cater to math teachers at all levels of experience.

BOOK REVIEWS

Science and Gender by Ruth Bleier. Pergamon Press, 1984.
Reviewer: Marilyn McCord Nelson, Associated Consultants, Bayfield, CO

This investigation of the effects of the past several millennia of "our" patriarchal society and its inherent oppressions focuses on a critique of biological theories. Bleier, a professor in the Neurophysiology Department and the Women's Studies Program at the University of Wisconsin-Madison, formerly practiced medicine for eight years; her qualifications allow her to speak with eloquence. In recent years, she has been engaged in the critical examination of the biological sciences and their Western androcentric and ethnocentric assumptions concerning issues relevant to human behavior and presumed sex differences.

Ruth Bleier is someone I would enjoy meeting. Her writing is informed, insightful, and for me, inciteful — an emotional journey. I found myself enraged at points, not because I disagreed with

Bleier, but because I disagreed so violently with the "facts" used by some of the sources she quoted in her analysis of how completely the patriarchal system has ensured its own preservation — at the expense and continued subordination of women. My consciousness of the victimization of women, and hence correspondingly also of men (a point not adequately made since patriarchy hurts us all), was intensified.

Several consistent themes are emphasized throughout the book. One is the paradox that "it is not our brains or our biology but rather the cultures that our brains have produced that constrain the nearly limitless potentialities for behavioral flexibility provided us by our brains." Another theme is the constant reminder of the many nonbiological forces which affect all life: ecology, demography, technology, ideology, and so on. Dividing influences into strict dualistic categories is simplistic and just plain inaccurate.

Bleier features writings from the nineteenth century as well as more contemporary work. Some items were as recent as the 1980s. For example, one quote from a book called *The Inevitability of Patriarchy*, 1973, says: "...human biology precludes the possibility of a human social system whose authority structure is not dominated by males, and in which male aggression is not manifested in dominance and attainment of position, of status and power." Her sources, however, are certainly not all negative (by my values). Some quotes, such as "...men's tasks are largely determined by what women do not do," drew cheers in my marginal comments. Bleier analyzes studies done on hormones, brains, and sex differences and points out the preponderance of flaws and the many misleading and unwarranted conclusions. She discusses inconsistencies in popular and widely accepted theories such as "Man-the-Hunter", which she suggests "straightjackets observations, interpretations, and understanding" relative to cultural evolution. She continually challenges traditional concepts of the patriarchy.

How did the patriarchy get the upper hand? (For more detail on this question — as well as historical examples of non-patriarchal societies — from the point of view of an archeologist/feminist, see Riane Eisler's *The Chalice and the Blade*, reviewed below.) Civilization, as recorded, was a male creation. Scientists, physicians, historians, and other powerful figures were almost entirely males from a few thousand years ago until very recently. Scientific theories in general, theories about women in particular, and scientific explanations of the perceived social and cultural differences between women and men were profoundly biased.

Bleier details some of the physical, legal, and social forces put in place to ensure that women conform (note present tense!) to the system. Men talk about the "nature" of women — define woman's nature biologically as wife and mother and point to "innate" characteristics which describe women as nurturing, passive, dependent, weak, intuitive, non-intellectual, and asexual, but, as Bleier adds, "nonetheless obligatorily heterosexual."

I particularly appreciated Bleier's comments on sexuality. Sex is the method of the individual and social control of women within patriarchal cultures. "Heterosexuality, as institution and ideology, is a cornerstone of patriarchy." An ideology and consciousness based on heterosexism are critical to perpetuating economic, political, and social subordination. Bleier speaks of the "major revolt" underway, but notes that the entire class of women has not risen up and the patriarchy is not collapsing, but only trembling. Hence the reintrenchment of the radical Right.

I also particularly liked the quotes at the beginning of chapters. The final chapter begins with "The master's tools will never dismantle the master's house." Using the same methods just replaces one tyrant with another. Therefore, what is the feminist task? (Unfortunately, only eight pages out of the 207 deal with this issue. This is my major criticism of the work — certainly I became more fully aware of the problems, but then, I already know them all too intimately. What I really wanted was more direction on positive alternatives.) While Bleier notes that "it may not be possible for us, immersed and marginalized in a patriarchal capitalist system and ideology of dominance, to conceptualize a feminist science," she does present some specific suggestions.

Calling it a courageous and difficult task, she asks us to examine and question "all of our assumptions and the very structure of our thought processes, all clearly born and bred within a profoundly stratified, hierarchical, patriarchal culture." These include assumptions about dominance and subordinance, women and men, objectivity and subjectivity; about causation, truth and reality; about what is "normal" and "natural"; about control and power; about reproduction and motherhood. She charges us to "question and examine all dualisms, all dichotomous ways in which nature, human 'nature,' and human activities are described, analyzed, and categorized." Challenge what is described as natural — the way things are. View reality as being contextual and in a constant state of flux and interaction.

Bleier further asks us to relinquish the need for control, even to acknowledge the implicit irrelevance of the issue of control. She speaks my mind with this plea. In doing this we become concerned with understanding process, change, and interaction, rather than causes and effects. She urges us to recognize the variety of experiences, knowledge, and attitudes as well as the particular skills and training each of us brings to an inquiry. "Together we illuminate many different facets, all varied aspects of the 'truth'. It is through this plurality of shared views and voices that we come to some understanding of nature, society, and ourselves." It is an issue of survival for both ourselves and our planet.

The Chalice and the Blade: Our History, Our Future by Riane Eisler. Harper & Row, 1988. ISBN 0-06-250289-1 (paperback); ISBN 0-06-250287-5 (hardcover).
Reviewer: Marilyn McCord Nelson, Associated Consultants, Bayfield, CO

Eisler talks about her book as one which opens a door. "The key to unlock it was fashioned by many people and many books, and it will take many more to fully explore the vast vistas that lie behind it. But even opening this door a crack reveals fascinating new knowledge about our past — and a new view of our potential future." This was so for me in reading her work.

Some of Eisler's own — and very personal (as a child she saw her father dragged away by the Gestapo) — life questions formed the basis for her book: "Why do we hunt and persecute each other? Why is our world so full of man's infamous inhumanity to man — and to woman?" She is convinced we are approaching an "evolutionary crossroads," and "never before has the course we choose been so critical."

The title derives from the cataclysmic turning point during the prehistory of Western civilization when the direction of our cultural evolution was quite literally turned around. The chalice symbolizes the life-generating and nurturing powers of the universe; the blade symbolizes the power to take rather than give life, the power to establish and enforce domination.

I was impressed with her outstanding research and archaeological skills used to re-examine our past, present, and future, including the whole of human history (including our prehistory) as well as the whole of humanity (both its female and male halves). Her book weaves together evidence from art, archaeology, religion, social science, history, and other fields. New patterns emerge, and they are not necessarily the same patterns I grew up with as a result of the "scientific views" advanced by primarily male-dominated, gender-biased scholarship.

Her chapters on "Reality Stood on Its Head: Part I and Part II," which lay bare the legends created by men to maintain their dominance, have forever changed my relationship to many Old Testament stories. But she doesn't stop with religion. Keeping women subordinate is an overwhelming theme in literature and film, politics, economics, in the very foundations of our present civilization. I like the observation she attributes to the French philosopher Charles Fourier (over a century ago): the degree of emancipation of women is an index of the degree of a society's emancipation.

Eisler's work reveals past societies where women and men lived in harmony with each other and nature. The civilization in Crete from 6000 to 2000 B.C.E. (before Christian era) was a particularly beautiful example of what she terms a "partnership society." Ever realistic, she stresses that "Crete was not an ideal society or utopia but a real human society, complete with problems and imperfections." Yet archaeologist Nicolas Platon, who worked on excavating the site for over 50 years, said of this civilization, "the fear of death was almost obliterated by the ubiquitous joy of living."

The alternative to a *partnership* society Eisler calls a *dominator* society. This is what we have lived with for several millennia. It is predominantly male-oriented, violent, and hierarchic, but it is *not* the way life necessarily is. Neither patriarchy nor matriarchy has to be. Social relations may be based on the principle of linking rather than ranking — diversity is not equated with either inferiority or superiority.

Eisler's application of chaos theory to the dynamics of social change was particularly interesting. She sees our times as a critical branching or bifurcation point, when rapid transformation of the whole system may occur. Our mounting global problems are in large part the logical consequences of a dominator model of social organization. We can experience breakdown, or breakthrough: new ways of structuring politics, economics, science, and spirituality. We can move into the new era of a partnership world. Concretely, this involves steps such as a redefinition of "power," "win-win" rather than "win-lose" views, redirection of global resources, and new "mental blueprints."

I have grown beyond my anger at what the *New Age Journal* calls "the greatest murder mystery and cover-up of all time." I find myself encouraged to self-consciously experiment anew with partnership images — in my relations with my family, in my teaching, in my community. In the words of the San Francisco *Examiner-Chronicle*, Eisler "...validates a belief in humanity's capacity for benevolence and cooperation in the face of so much ... destruction. Eisler has brought the scope of feminist scholarship out of the ghetto."

Happier by Degrees: A College Reentry Guide for Women by Pam Mendelsohn. Revised Edition. Ten Speed Press, 1986. **Degrees of Success** by Pam Mendelsohn. Peterson's Guides, 1989.
Reviewer: Phyllis Chinn, Humboldt State University

This pair of books alternates thumbnail sketches of women who have returned to college after varying periods of time away from school with useful information regarding a variety of concerns for reentry women. The author wrote these books following her own experience of going back to school and finding a complete lack of written information regarding her own questions, worries and concerns. As she admits in the books, the sample of women included was serendipitous rather than planned. I was concerned, although not surprised, to note that very few of the hundreds of women mentioned in these books wound up in scientific careers. This suggests to me that we need to continue and expand efforts to encourage women with mathematical and scientific interests to pursue careers involving these fields. At the other end of the spectrum, I was pleasantly surprised by how few of these women were deterred from their goals by math anxiety! Again the author's biased sample may have missed the women who weren't even willing to discuss their failures to meet math requirements or who never even started back to school due to their sense of inadequacy.

All in all, I think these are useful books to recommend to women considering college as well as for those of us who advise reentry students.

Relearning Mathematics: A Different Third R — Radical Maths, by Marilyn Frankenstein. London: Free Association Books, 1989. xxiii + 278 pp (paperback). ISBN 1-85343-091-9. In the U.S., order from Columbia University Press, 562 W. 113th St., NY, NY 10025, $19.00 + $3.00 postage and handling.
Reviewer: Claudia Zaslavsky, Education Consultant, New York, NY

From any point of view, this is a most unusual textbook — and a welcome one. Marilyn Frankenstein works with adult students at the College of Public and Community Service of the University of Massachusetts in Boston, an ideal setting, if any exists in this country, for the kind of teaching that she advocates. Not only does she use examples that are applicable to her students' fields of work, but she is a consistent advocate of social change, as the title of her book implies. "Radical" is used in the political sense, as well as in the sense of "getting to the root," the root of math avoidance and of misconceptions about the nature of mathematics.

As Frankenstein states in her note to readers (pp. xx-xxi): "Two main goals of this text are to help you gain the self-confidence to realize that you can relearn maths and, simultaneously, to help you realize that *right now* you already do intellectual work in maths." She warns that "you will be urged to take your intellectual work in maths seriously. Intellectual work is hard work — relearning maths needs to be approached with discipline and persistence. With that attitude you will relearn maths in such a way that you will appreciate its underlying structures and will be able to use it as one way of understanding or, as Freire would say, reading the world."

This is the first of two volumes and is divided into two parts. Part One is entitled "Mathematics: anxiety, anger, accomplishment" and begins by discussing misconceptions about learning mathematics, the kind of misconceptions that are engendered by societal stereotypes and poor teaching. How to deal with one's anger is the next topic, followed by chapters on using a calculator (it's not cheating!), keeping a journal, cooperative learning (neither is working with others a form of cheating), and self-evaluation. She relates the experiences of math-anxious people and quotes from the writings of other teachers, including Dorothy Buerk, Fran Rosamond, and others who may be familiar to readers of the AWM *Newsletter*. In another chapter, "Multicultural considerations," she discusses arithmetic methods that people have brought with them from other cultures, different ways of viewing mathematics based on one's societal background and/or gender, non-European contributions to mathematics, and the mathematical skills, often unrecognized, developed by various peoples in the course of their daily lives.

The second part of the book focuses on the meaning of numbers, with emphasis on the underlying concepts. In each chapter are explanations of the concepts, solved problems of various types (drill, thought, applications to real world situations, and recreational uses), similar problems for the reader to work out, and a quiz. Answers, with full explanations and discussion of possible sources of misunderstanding, are at the end of each chapter.

Throughout the book, Frankenstein is concerned with the *feelings* of her readers, as she must be with those of her students. Readers are encouraged to write and discuss their math autobiographies, to pinpoint episodes in their lives that turned them away from mathematics, and even to frame answers to adults who had put them down decades earlier. Often she refers to her own fears and difficulties, such as her fear of driving.

Applications are drawn from a wealth of sources and include quotations from and references to history, literature, psychology, sociology, economics, biology, dietetics, art, biography, and more. Just to take a few examples, the problems on pages 64-68 deal with the following topics: the income of blacks, Hispanics, and whites in major U.S. cities; the amount of iron in various foods (from the cookbook *Laurel's Kitchen*); the lengths of new-born and adult sunfish and bears; women's unpaid labor; the calories burned while bicycling fast; the dollars spent on university-military research; the distribution of wealth in the U.S.; TV watching by teenagers; and the distribution of females and blacks in the health professions. Relevant political cartoons illustrate many of the issues.

In an appendix entitled "Critical mathematics," Frankenstein writes:

> Often in our highly technological world, an overemphasis on numerical information obscures the reality of people's lives and diverts our attention from ways of changing that reality... Yet, as this book argues, there are many struggles to humanize our lives that are illuminated, and even driven forward, by numbers. Some major goals of this text have been: to help you develop the confidence to analyse the numbers presented by others about issues of importance to you; to help you develop the knowledge with which to make decisions about the kinds of numerical data you need to analyse those issues; and to help you develop the skills to research and use those statistics (page 260).

The appendix concludes with lists of publishers, research guides, and organizations, in both Great Britain and the United States, that advocate social change.

Frankenstein discusses a possible objection to the book (page 5): "The 'non-neutrality' of the entire presentation: by including only one point of view, isn't this text 'propaganda'?" To this criticism she responds that "no knowledge or education is neutral. Most schooling and daily life bombard us with messages supporting the status quo... . Even traditional maths courses which provide no real-life data carry the non-neutral hidden message that learning maths is separate from helping people understand and control the world."

The book has two forewords and an afterword. The first, by the American critic Henry A. Giroux, describes how this book embodies both critical pedagogy and politically useful knowledge. He has important ideas to convey, but I wish that he had phrased his thoughts in the "clear and accessible language" for which he rightly praises Frankenstein.

In the second foreword, the British mathematics educator Europe Singh deplores Britain's turn to "back to basics" in mathematics, with its mandated national curriculum and standardized testing. He quotes Prime Minister Thatcher (Page xv): "Children who need to count and multiply are being taught anti-racist maths, whatever that may be," and contrasts this narrow approach with the breadth of Frankenstein's goals.

In the afterword, the Brazilian professor Ubiratan D'Ambrosio, originator of the concept of "ethnomathematics," considers this book one of the "best comprehensive examples of it... . [Mathematics] has its origin in the people and to the people it belongs" (page 268).

A most unusual and attractive book!

NOTE: *Mathematics and Global Survival* by Richard Schwartz, which was reviewed by Claudia Zaslavsky in the May-June issue of the *Newsletter*, can be ordered from Ginn Press, 160 Gould Street, Needham Heights, MA 02194, attention Kathleen Kourian. Telephone: 1-800-428-GINN.

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ARE STUDENT RATINGS UNFAIR TO WOMEN?

by Neal Koblitz, University of Washington

In the March-April issue of the AWM *Newsletter*, I asked for information on whether or not student ratings tend to discriminate against women. The purpose of this article is to report briefly on the response to my query.

I was extremely pleased to receive a large number of quite varied responses. Some people wrote their general impressions and described their personal experiences. Others generously sent me reprints of papers on the subject, or gave me advice on where to look for more material. To my surprise, it turns out that quite a lot has been written on this question, but not in journals which mathematicians normally read (see the bibliography below).

I will not attempt a systematic survey of the research and opinions on the subject. For this the reader is referred to the short list of references below, which includes the papers which I found to be the most interesting (more extensive lists of papers can be found in their bibliographies). Rather, I will summarize my own conclusions based on the material that was sent to me.

A few of the letters I received and some of the early studies indicate that often women receive equal or higher student rating numbers than men. In many situations students perceive (probably correctly) that the women instructors tend to be more sensitive to their needs, more concerned and caring, and more dedicated to teaching than the male instructors (it also helps if the woman is thought to be lenient) — and as a result reward them with higher ratings. This causes some people to conclude that there is little or no discrimination against women in student ratings.

However, a more careful examination of the question shows that the reality is more complex. Note that the traits listed in the last paragraph which may lead to high ratings for women are compatible with sex-stereotyped expectations of women as "mother figures." According to Kierstead *et al.* [6], "Taken as a whole, [our] results suggest that if female instructors want to obtain high student ratings, they must be not only highly competent with regard to factors directly related to teaching but also careful to act in accordance with traditional sex role expectations. In particular, ... male and female instructors will earn equal student ratings for equal professional work only if the women also display stereotypically feminine behavior."

Thus, the difficulty for women would tend to occur in cases where instructors have to adopt a "get-tough" approach. Such a situation is much more likely to arise in a math department than, for example, in psychology or sociology, because (1) mathematics departments typically are called upon to perform the role of enforcer of academic standards, with service courses acting as a "weeding out" device for the engineering and science departments, and (2) the discrepancy between students' high school preparation and study habits and the demands of college work is especially glaring in mathematics.

If an instructor feels compelled to put students under pressure (assigning a lot of homework, giving challenging exams), then only the most serious and mature students are at all likely to respond with high ratings at the end of the course. Most students are inclined to "punish" the instructor. There is considerable evidence that the "punishment" is more severe if the instructor is female.

> [According to] Susan Kay's classroom studies... male students were far more likely to give lower ratings to those female faculty perceived to be hard graders.... This finding is consistent with a series of experiments at the University of Dayton that indicated that college students of both sexes judged female authority figures who engaged in punitive behavior more harshly than they judged punitive males.... ([8], p. 484-485)

See also the studies by Kierstead *et al.* [6] and Bennett [3], which lead to similar conclusions.

Bennett, in particular, found that women will be rated highly only if they are especially accessible to the students and spend a lot of time with them, while men can receive equally high ratings while remaining more aloof. In other words, students tend to allow men but not women to spend most of their time on research and other non-teaching activities without penalizing them in the ratings: "...male instructors are judged independently of students' personal experiences of contact and access, whereas female instructors are judged far more closely in this regard. In this sense women are negatively evaluated when they fail to meet this gender appropriate expectation..." ([3], p. 177-178).

One of the most interesting studies was made in the 1970s by Ellyn Kaschak [5]. 50 male and 50 female students were given a set of descriptions of the teaching methods and practices of professors in various specialties. In the forms received by half of the students (25 males and 25 females) the professors were given names of the opposite gender from the professors in the forms received by the

other half of the students. Kaschak found that the male students were biased against women, while the female students were not.

The possibility of sex discrimination is one complex and controversial aspect of the broader question of the validity of student ratings as a measure of teaching effectiveness. It would take us too far afield to discuss some of the other problems identified in the many studies that have been conducted. But it is worth noting that, generally speaking, math departments are usually put at a special disadvantage if administrators and faculty in other departments have excessive confidence in the meaning of student rating numbers and in the value of cross-department comparisons. A larger proportion of our students take courses as requirements rather than electives and view the subject as difficult. This tends to bring down math department ratings across the board and leads to an unjustified belief on campus that the math department has worse teachers than other departments.

People outside of the mathematical sciences often have a naive faith in the value of numbers and are less aware than we are of the pitfalls in taking raw statistics at face value.

...[S]tudent rating scales are a form of measurement and, according to American Psychological Association standards, should be accompanied by information about the meaning, interpretation, and limitations of the scores — yet most student ratings are not accompanied by such information; [in fact,] promotion and tenure decisions are usually made by an array of administrators and faculty committees who are naive about the standard criteria for measurement instruments, and hence do not know how to interpret the results or do not realize their limitations. ([9], p. 88)

In practice, the treatment of student ratings by college administrations varies considerably. On the one hand, McMaster University (Hamilton, Ontario) is among the institutions that have conducted careful studies of the validity of student ratings and seem to have adopted a cautious and sophisticated approach to the subject. At the other extreme, I received letters from two different women in the mathematical sciences at a university in western Canada, complaining bitterly of the unfair and cynical way that administrators at their university are using student ratings as a weapon against the faculty, especially the female faculty.

And at the University of Arizona, the director of an office of "Instructional Research and Development" circulated a tract [1] to faculty members purporting to correct certain "myths" held by sceptics. "Myth 7" is: "Gender of the student and the instructor affect[s] student ratings." The article proceeds to refute this "myth" by means of a highly selective and distorted citing of the literature. Of course, someone in the math department at the University of Arizona is not likely to be aware of the numerous studies that give convincing support to Myth 7 (none of which are mentioned in [1]), and so could easily be taken in by the self-serving and intellectually dishonest propaganda.

Some Conclusions

1. Student ratings can provide valuable feedback to the instructor her/himself, but they cannot be properly understood by someone who is not familiar with the nature of the course being rated, the characteristics of the students, and the pedagogical objectives of the instructor.

2. On the student rating forms, questions which are very specific (e.g., "promptness in correcting exams," "availability for office hours") are less likely to invite biased responses than questions of a general nature ("rate the instructor overall").

3. In certain teaching situations which are frequently encountered in math departments (especially in introductory-level courses), students tend to discriminate against women instructors on the rating forms.

4. Math departments and administrators have an ethical and legal obligation not to base promotion and salary decisions on data which are biased against women.

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THE 1990 SONIA KOVALEVSKY HIGH SCHOOL MATH DAY

by Donna Beers, Associate Professor, Simmons College

On Thursday, April 5, 1990, one hundred seventy-five young women high school students and forty-three high school teachers from twenty-eight Boston-area schools met at Simmons College to attend the fifth Sonia Kovalevsky High School Math Day. Sponsored by AWM and Simmons College, this annual event aims to encourage young women to study mathematics throughout all four years of high school and to give students and teachers honest applications of good mathematics through hands-on, workshop experiences.

The morning part of the Sonia Kovalevsky Day consisted in separate, parallel programs for students and teachers. For students there were four workshops: "Number Theory and Our Daily Lives" (leader: Anne Roberts, Emmanuel College), "Testing for Trends in the Weather" (Robert Goldman, Simmons College), "Graph Theory to Solve Routing Problems" (Joyce Anderson, Salem State College), and "Whetting Your Appetite: A Look at Taste Tests" (Michael Schmidt, Simmons College). Teachers, on the other hand, participated in three workshops: a microlab, "Dynamical Systems and Chaos: Classroom Experiments" (Marilyn Durkin, Bentley College); "The Birthday Problem, Hashing, and Freshman Calculus" (Margaret Menzin, Simmons College); and a roundtable discussion, "The Ideas that Work Come from Teachers" (Jo Ellen Hillyer, Newton North High School and Eleanor Palais, Belmont High School). In addition to workshops, students also attended a morning panel discussion, "Multiply Your Options ... With Math!" (moderator: Donna Beers, Simmons College), led by Dr. Myra Jean Prelle, Principal Research Scientist at MITRE Corporation; Marjorie Sullivan, Area Operations Manager at New England Telephone and Telegraph; and Laura Persily, U.S. Operations Projects Manager at Digital Equipment Corporation. Panelists described their careers and the role of mathematics in preparing them and helping them to advance professionally. Our goal in having the panel was for students to see real women doing really interesting work. The following evaluation was typical:

> The panel helped a lot. I enjoyed hearing about other people who have succeeded in math, and learning what is possible for me to do.

Following the morning session, students and teachers joined each other for lunch and were officially welcomed by Professor Anne Coghlan, Dean of Sciences, Simmons College. This year's luncheon speaker was Dr. Arlene Ash, Associate Professor at Boston University School of Medicine and Boston University School of Public Health. Her address, "Of What Use is Mathematics: War Stories from a Mathematician in Public Policy," was deeply personal and moving. Noting that "...feeling comfortable with math is (sadly) a rare skill in our society," she described the "destructive myth" that has developed, that "math skills are a real genetic talent" and a "comforting, though equally destructive companion myth" that "it's O.K. to be math illiterate, because: If you haven't got it, then you haven't got it."

Drawing on her own experiences, Dr. Ash drove home the point that "...math is like any other human endeavor: exceptional talent is exceptional, but just about anybody who works at it can do well." The elements of her background that helped to make her a math literate person were: "an early positive self-image" (in fifth grade she developed the reputation as a math wiz because an older brother taught her the solution to the general quadratic equation), "a can-do, non-mystifying family

attitude," and "...praise, support, and encouragement for good work in math, no less than in other subjects."

Stating that "...there is no one so powerful in a room as the person who combines both analytical (quantitative) and descriptive (verbal) skills," Dr. Ash described her transition from undergraduate and graduate mathematics to a Ph.D. in statistics and a career in public policy. She has served as an expert witness at environmental impact hearings for Seabrook nuclear power plant and in cases on equity in teachers' pay and advised attorneys general on fairness in jury selection. In the medical field, Dr. Ash has done research on clinical trials at the Sidney Farber Cancer Institute and advised the federal government on Medicare payment policy.

Dr. Ash ended her address with the hope that "my talk today has given some advice, encouragement, and above all, *enthusiasm* for the difficult and rewarding task of making fluency in math an integral part of your lives.

You can judge from the following excerpts whether she succeeded:

Dr. Arlene Ash was incredibly interesting and grabbed and held my full attention. She was a dynamic and energetic speaker. [student]

The keynote speaker was spectacular ... so human and engaging, relevant, and inspirational. [teacher]

A videotape of Dr. Ash's talk may be obtained by contacting Tricia Cross, AWM Executive Director, at the AWM office.

The whole day was summed up by one student evaluation:

I got a knowledge of how math affects many jobs. I learned that math is not just numbers. It is a puzzle that has to be put together, piece-by-piece. I learned to give math a chance. You can do a lot with math. It will affect your whole life.

Support for this year's Sonia Kovalevsky High School Math Day was provided by AWM, Arthur D. Little, Inc., MITRE Corporation, and Digital Equipment Corporation.

WOMEN DO MATH

For the last three years the Department of Mathematics and Statistics at Simon Fraser University in Burnaby, B.C., Canada has held "Women Do Math" conferences. The intent has been to foster interest in mathematics and the sciences and to stress the importance of mathematics in broadening career options for young women. Held in November of each year, the conferences have attracted about 450 young women in grades 9 and 10 and their teachers and parents from the greater Vancouver area. Tasoula Berggren, lab instructor in the math department at S.F.U., was the originator of the conferences and has continued as the coordinator all three years.

This year the opportunity was offered to five other communities in B.C. and the Yukon to hold such conferences. Under the sponsorship of the Society for Canadian Women in Science and Technology (SCWIST), the Department of the Secretary of State of Canada and the Office of the Dean of Science at S.F.U., "Women Do Math" conferences were held in the first two weeks in May in Campbell River, Kamloops, Ft. St. John, and Terrace in B.C. and in Whitehorse in the Yukon Territory. These locations vary in population from about 10,000 (Terrace) to over 60,000 (Kamloops), and all have resource based economies. We felt that it was necessary to extend to young women in these communities the opportunity to meet professional women in mathematics, the sciences and technology and to describe the opportunities available for those who pursue a career involving mathematics and science. Selection of young women to attend was the responsibility of the local math and science teachers, not to be limited just to the best and most enthusiastic, but rather to be open to any young women who expressed an interest in attending.

A general organizing committee was set up under the sponsorship of SCWIST at S.F.U. in January of this year with Tasoula Berggren as director. Also on the committee were Joan Sharp, biology lab instructor; June Sharp, employment equity coordinator; Sarah Stephens, systems analyst, computer services; Lin Szpitun, Ph.D. student, mathematics department; and Florida Town, publicity and media relations, all at S.F.U. A "Women Do Math" mini-conference was held at S.F.U. in early February with a representative from each location attending. A description of the conference at S.F.U. was presented with equal time given to contents and organization. Workshops, the heart of the conferences, were described in detail as were the careers and science talks. The afternoon was spent

on conference organization with particular emphasis on the logistics of agendas, transportation (particularly important in more remote locations), meals and communication with local school districts, teachers and parents.

The representatives returned to their communities with workshop descriptions, computer discs and organizing ideas. They then had to set up local committees, find local sponsors, speakers and workshop leaders. The general committee also supplied three speakers to each location, some funding, "Women Do Math" T-shirts, posters, and general coordination and information.

Although agendas varied somewhat in the different locations, the overall structure was very similar. After an opening address the careers talk was presented. About 30 minutes long, this talk addressed the reality that most of the young women would find themselves in the workforce for much of their adult lives and that the academic choices that they make now will affect their lifestyle and job satisfaction for years to come. The growing shortage of scientifically and technically trained people was emphasized. The science talk also lasted thirty minutes. This was presented by a women scientist who talked about her career in science or mathematics, her own research and the research of other women. Science speakers were chosen for their enthusiasm and their ability to direct their talk at the right level for the young women attending. The conference participants also attended three workshops, each about forty minutes long and with 10 to 20 young women attending. These were intended to be challenging and exciting without being intimidating. Working cooperatively in small groups was emphasized in most workshops, and whenever possible the participants were able to take something home with them, from handouts to origami. Computer workshops, paper folding, tiling and mathematical tricks were all popular. The conferences closed with panel discussions in which women in math-based careers talked about their jobs and the participants were encouraged to ask questions.

Campbell River is a forestry, mining and fishing community of about 17,000 on Vancouver Island. Ninety women from the three district high schools attended the conference on May 3rd which was held at the local campus of North Island College. The local organizer was Dana Williams, a mining engineer, and the local sponsors included the University Women's Club, the college and the school district. Volunteers included a geologist, a veterinarian and an optometrist, all of whom presented workshops and participated in the panel discussion. Lin Szpitun, from the general organizing committee, gave the science talk, titled "What do mathematicians do?"

Ft. St. John also had its conference on May 3 at Northern Lights College. Ft. St. John is a community of about 14,000 in northern B.C. with an economy based on agriculture, forestry and the oil and gas industry. A grade 7 teacher, Linda Haugen, was the local organizer. Registration was limited to 125 as facilities were not available for more. Particularly exciting was the science talk and workshop presented by Diane Ingraham, an engineering professor at S.F.U. Diane talked about and demonstrated her recent project involving the construction of musical instruments for the handicapped.

Terrace was the smallest community involved. With a population of only 10,000, it is a local commercial centre in an area with a forestry based economy. Frieda Dams of Northwest Community College was the local organizer, and the conference was held at the college on May 10. Despite the size of the community, this was the largest conference with over 160 young women participating. Hilda Ching, a consultant on fish parasite diseases and past president of SCWIST, gave the science talk, and June Sharp from S.F.U. gave the careers talk and a very popular workshop on career choices, income and lifestyle.

Kamloops was the largest community with over 60,000 in the city and over 70,000 in the area. Donna Mason of Cariboo University College was the local organizer, and the college and the school district were amongst the enthusiastic local sponsors. One hundred and thirty women from 14 area high schools attended on May 10th. A highlight of the Kamloops conference was the science talk by Eleanor Boyle, a Ph.D. candidate in neuroscience at the University of B.C. She described her research on how the brain works and on diseases of the brain.

The Whitehorse conference on May 5th was organized by Elda Ward of the Women's Directorate of the Government of the Yukon and was held at the two-year-old Yukon College. The Yukon Territory has only about 26,000 people, and over 20,000 of them live in Whitehorse. Tasoula Berggren, director of the project and 1989-90 president of SCWIST, gave the careers talk and two workshops, and Judith Myers, a plant scientist and Associate Dean of Women in Science and Technology at the University of B.C., gave the science talk.

The success of all five conferences was only possible because of the enthusiastic support of each local community. In each case the local community college supplied facilities, and the school district excused the students and teachers for the day and provided transportation. Local women in education, science and professional careers volunteered their time and energy with much enthusiasm. Some of

the communities have already indicated their intention to make the "Women Do Math" conference an annual event.

Students at each location were given evaluation forms to complete, and although we have not yet received the results, we are, because of the excitement and enthusiasm at each location, confident that the evaluations will be generally positive. Evaluations from the S.F.U. conferences have always shown the workshops to be the most popular, and we expect to hear the same this time. Having these conferences in the smaller centres is extremely important because the young women there will probably never have met a scientist or mathematician and only a few professional women. We believe that the opportunity for them to meet and talk with these women will help them to expand their personal horizons and that this will encourage them to continue studying mathematics.

The next "Women Do Math" conference will be held at S.F.U. in February of 1991. As Tasoula Berggren will not be here next year, June Sharp and Lin Szpitun will be co-organizers for this conference. Plans for local conferences for next year are still vague, but we hope that the number of communities involved can be expanded and that the five that participated this year will do so again.

Call for Nominations:

The Louise Hay Award for Contributions to Mathematics Education

The Executive Committee of the Association for Women in Mathematics (AWM) establishes the Louise Hay Award for Contributions to Mathematics Education, to be given annually to a woman at the January Business Meeting beginning in January 1991. The purpose of this award is to recognize outstanding achievments in any area of mathematics education, to be interpreted in the broadest possible sense. The awardee will be selected by a committee appointed by the President and will receive a citation at the AWM Business Meeting.

While Louise Hay was widely recognized for her contributions to mathematical logic, and for her strong leadership as Head of the Department of Mathematics, Statistics, and Computer Science at the University of Illinois at Chicago, her devotion to students and her lifeling commitment to nurturing the tallentt of young women and men secure her reputation as a consumate educator. The annual presentation of this award is intended to highlight the importance of mathematics education, and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

Nominations for the award should be sent by December 15, 1990 to:

> The Hay Award Committee
> c/o Patricia N. Cross
> Association for Women in Mathematics
> Wleslley College, Box 178
> Wellesley, MA 02181
> 617-237-7517

ACADEMY FOR MATHEMATICS AND SCIENCE TEACHERS IN CHICAGO

The Academy for Mathematics and Science Teachers in Chicago was opened recently. The brainchild of Nobel laureate Leon Lederman, the purpose of the institute is to provide updated training for all 15,000 Chicago public school educators teaching science and mathematics. Gordon Berry, an atomic physicist at Argonne National Laboratory, is acting director of the academy.

The Illinois Institute of Technology is currently providing space rent-free. The academy will be started up with federal funds. The annual funding goal is $8 million, to be sought from state, local, and private money.

Programs will be tailored to meet the needs perceived by teachers and principals of participating schools. Teachers will spend about half of their time at the academy over a ten-week period and the remainder of the time in the classroom testing out their new ideas for improving math and science instruction.

TREASURER'S REPORT: JUNE 1, 1989 through MAY 31, 1990

ASSETS as of June 1, 1989

Operating Funds	$31,535.45
Washington Water Power, 5 shares valued at	111.88
Reserve Funds	18,364.74
ATSchafer Prize Fund	10,465.00
TOTAL ASSETS	$60,477.07

RECEIPTS:

Dues − Individual	$21,429.15
Family	1,525.00
Institution	15,389.00
NSF Travel Grant transfer	10,000.00
Exxon Grant for AWM	10,000.00
Exxon Resource Center Grant	30,000.00
Raytheon Grant for AWM-Simmons Summer Institute	10,000.00
DEC Grants for AWM-Simmons Programs	11,000.00
AD Little Grant for AWM-Simmons SKHSDay	1,000.00
MITRE Grant for AWM-Simmons SKHSDay	1,000.00
ATSchafer Prize Contributions	4,870.00
People-to-People Intl. China Delegation Contributions	15,100.00
Advertising	725.00
Purchases	297.52
Contributions	2,428.47
Interest on operating funds and dividends	3,464.40
TOTAL RECEIPTS	$138,228.54

OTHER INTEREST INCOME:

Reserve fund interest	$1,677.60
ATSchafer fund interest	$1,063.51

EXPENSES:

Wages and FICA for Executive Director (1)	$26,454.60
Operating Expenses (1)	11,512.41
Newsletter Expenses	8,463.45
Bulk Mailing	1,460.00
AWM National Meetings (1)	332.79
Dues and Fees: Massachusetts Incorp. Fees, CBMS	337.50
Exxon grant expenses: Meetings, SKHSDay Awards	10,141.07
NSF grant expenses	21,562.57
Exxon Resource Center expenses	3,590.47
AWM-Simmons Summer Institutes	20,000.00
AWM-Simmons SKHSDays (1)	3,000.00
People-to-People China Delegation	15,100.00
TOTAL EXPENSES	$121,954.86

TRANSFER to ATSchafer Prize Fund	$3,820.00

BALANCES as of May 31, 1990

Operating Funds	$43,989.13
Reserve Funds	$20,042.34
ATSchafer Prize Fund	$15,348.51

(1)   Amounts are less expenses charged to NSF and Exxon grants.

Respectfully submitted, Jenny A. Baglivo, Treasurer
Mathematics Department, Boston College, Chestnut Hill, MA 02167

Women in Mathematics and Science: Pipeline to the 21st Century

The American Association of University Women (AAUW), the Association for Women in Mathematics (AWM), and the Society of Women Engineers (SWE) will sponsor a program entitled: "Women in Mathematics and Science: Pipeline to the 21st Century" on Thursday, October 11, 1990 at the Marriot Hotel in Providence, Rhode Island.

The afternoon/evening program will focus on a number of critical topics such as gender issues in mathematics and science, mathematics education reform, and the need for the Rhode Island workforce to keep pace with the changing demands for skilled workers in business and industry. Rhode Island (and neighbors) high school mathematics and science teachers, area college faculty, and representatives from business, industry and government will be among the diverse groups invited.

Program:

There will be two afternoon panel discussions, a dinner and a keynote address delivered be Dr. Anne L. Bryant, Washington DC, Executive Director of AAUW and the Director of the AAUW Education Foundation. The title of the first panel is "Mathematics/Science in Business and Industry: Creating Partnerships for Excellence." The second panel is entitled; "Bridging the Gender Gap in Mathematics and Science." Outstanding leaders at the state and national level will participate in these programs.

Program Participants:

The first panel will begin at 2:00 p.m. and will include: Dr. William Jaco, Executive Director, American Mathematical Society; Ms. Dorothy Kelly, Scientist, Ciba-Geigy; Ms. Elaine Nelson, General Manager, Carbide Products and President of the Society of Manufacturing Engineers; and Dr. George Walsh, Assistant General Manager, Raytheon Submarine Signal Division.

The second panel, "Bridging the Gender Gap in Mathematics and Science" will begin at 3:30 p.m. and include: Ms. Mary Christian, Science Department Chair, Exeter/West Greenwich High School; Linda Nightingale Greenwood, Education Specialist, Sex Equity and Adult Programs, RI Department of Elemantary/Secondary Education; Dr. Rhonda Hughes, Professor of Mathematics and Department Chair, Bryn Mawr College; Dr. Ann Moskol, Professor of Mathematics, Rhode Island College, and Dr. Anne Fausto-Sterling, Professor of Biology and Medicine, Brown University.

For more information ...

Call the AWM office at (617) 237-7517. All AWM members in Rhode Island, Connecticut, and Massachusetts will receive a conference announcement and reservation form.

HISTORY OF MATHEMATICS

The next annual meeting of the Canadian Society for History and Philosophy of Mathematics will be May 27-29, 1991, at Queen's University, Kingston, Ontario. The theme of the special session will be "Women in Mathematics." This meeting will be part of the Learned Societies Meetings. To join, send $15 Canadian or $11 U.S. (or $34 U.S. if you want a subscription to *Historia Mathematica* included) to Professor M. Malik, Department of Mathematics, Concordia University, Concordia University, Montreal, Quebec H3G 1M8, Canada.

Another organization for people interested in the history of math is the International Study Group on the Relations Between History and Pedagogy of Mathematics (HPM for short). To receive the (free) newsletter, write to Victor Katz, Department of Mathematics, University of District of Columbia, 4200 Connecticut Ave. NW, Washington, DC 20008. HPM has its annual meeting in conjunction with NCTM every year. There will also be a special session at the AMS in San Francisco in January where Barnabas Hughes, Joseph Dauben and David Zitarelli are scheduled to speak.

ADVERTISEMENTS

All institutions advertising in the AWM NEWSLETTER are **Affirmative Action/Equal Opportunity Employers.** Institutional members of AWM receive two free ads per year. Please see the statement of **Advertisement Guidelines** at the end of this listing. Ads must be prepaid by check or P.O. Institutions are listed in alphabetical order.

Faculty Positions

Bryn Mawr College. Department of Mathematics, invites applications for a tenure track assistant professorship in mathematics, to start September 1991. Candidates should have a doctorate in a mathematical science, or expect to have it completed by Sept. 1, 1991. Candidates are expected to show promise in research and a commitment to teaching, All fields are acceptable, with a preference for algebra or applied mathematics. Bryn Mawr is an Equal Opportunity/Affirmative Action employer, and seeks faculty and staff knowledgeable about and concerned with multicultural and international issues. Minority candidates and women are especially encouraged to apply. Closing date January 1, 1991. (Late applications may be considered.) Send application and three letters of recommendation to: Search Committee, Department of Mathematics Bryn Mawr College Bryn Mawr, PA 19010. Telephone: (215) 526-5348; Email: MSEARCH@BRYNMAWR.

California Polytechnic State University. Tenure track positions for 1991-92 academic year, Mathematics Dept. Salary and rank commensurate with qualifications and experience; assistant professor preferred. The teaching load is 12 units per quarter plus 3 units of instructionally related responsibilities. A doctorate in mathematics is required. A strong commitment to both teaching and research is expected. For additional information or an application, write to: Dr. Thomas Hale, Chair, Mathematics Department, California Polytechnic State University, San Luis Obispo, CA 93407. Closing date for receipt of applications is December 1, 1990. Cal Poly is an Affirmative Action/Equal Opportunity Employer, and welcomes applications from women and minorities.

Harvey Mudd College. Dept. of Math. Clare Booth Luce Professorship. Applications invited from outstanding women candidates for appointment to a Clare Booth Luce Assistant/Associate Professorship in the Department of Mathematics starting in 1991/1992. Preference will be given to applicants whose research and teaching interests are in differential equations, dynamical systems, or applied analysis. The successful candidate will be expected to teach courses in her area of specialization, as well as general introductory calculus and differential equations courses, and to pursue an active research program. The Clare Booth Luce Professorship provides substantial supplemental funds for five years which can be used to cover professionally related expenses. Interested women should send a curriculum vitae, a statement of current research interests, and information on teaching experience. Candidates should arrange to have three letters of reference sent and those candidates at the beginning assistant professor level should also arrange for official transcripts to be sent. All application materials should be sent or mailed as soon as possible but, at the latest, to meet an October 1, 1990 deadline. Please address inquiries and applications to: Dr. H. Krieger, Chair, Department of Mathematics, Harvey Mudd College, Claremont, CA 91711. (714) 621-8000 ext. 3618/8023. FAX: (714) 621-8465. Harvey Mudd College is an Affirmative Action/Equal Opportunity Employer.

Haverford College. Mathematics Department. Haverford announces a tenure track opening for 1991-92 in the Department of Mathematics, at the Assistant (or possibly Associate) Professor level. Applicants are invited from candidates with research interests in any field of mathematics. Candidates should demonstrate a strong commitment to teaching a broad spectrum of undergraduate courses, and to research. Send curriculum vitae, statement of research interests, and three letters of recommendations

to: Curtis Greene, Chair, Department of Mathematics, Haverford College, Haverford, PA   19041. Haverford College is an EO/AA Employer.   Women and Minorities encouraged to apply.   Deadline for applications: December 7, 1990.   Late applications may be considered until the position is filled, but this cannot be guaranteed.

Indiana University - Purdue University at Indianapolis (IUPUI). Dept. of Mathematical Sciences is seeking app. for a senior position at the level of full prof., in sci. computing/numerical analysis.   The pref. starting date is Jan. 1, 1991.   A later starting date is negotiable.   The successful candidate is expected to provide leadership to a new interdisciplinary prog. in computational sci. to be developed jointly by the Dept. of Math. Sci. and the Dept. of Comp. and Inform. Sci.   App. must have an earned doctorate, a strong background in app. and num. analysis, a commitment to excellence in teaching, and a demonstrated record of research accomp.   Special pref. will be given to candidates whose expertise and interest are in the dev. of asymptotics based numerical methods and their applications to large-scale scientific prob.   App. and inquiries should be addressed to Prof. Bart S. Ng, Chair, Dept. of Math. Sci., IUPUI, 1125 E. 38th St., Indianapolis, IN 46205-2810. Closing date: December 1, 1990. late app. will be considered until the position is filled.   IUPUI is an AA/EO Employer. Women and minority candidates are encouraged to apply.

Johns Hopkins University. The Math. Sci. Dept. invites app. for the 1991-92 Eliezer Naddor Postdoctoral Fellowship.   The fellow is to be an outstanding graduating doc. student in math., stat., or oper. research, who plans an academic research career.   The fellowship provides full support for 12 mo. of postdoc. study at the dept in an area of interest to some dept. faculty memb., free from teaching and admin. duties.   Selection is made without discrimination on the basis of color, race, religion, sex, or national origin.   App. should provide a current vita, a letter describing career aspirations and a research plan for the fellowship year, and transcripts, and should arrange for three letters of rec. to be sent, by January 15, 1991, to: Prof. John C. Wierman, Chairman, Mathematical Sciences Dept. 220 Maryland Hall. The Johns Hopkins University. Baltimore, Maryland 21218.   App. for pos. in algebra, analysis, diff. equations, geometry, number theory, and topology should contact the Math. Dept. instead of the Math. Sci. Dept.

Michigan State University. Chairperson. Dept. of Math. MSU invites app. for the pos. of Chairperson of the Dept. of Math.   The Dept. has more than 70 reg. faculty; over 125 grad. students are enrolled in its PhD and Masters degree programs.   App. should have an outstanding record of research and scholarly activity in math.   App. should also possess the leadership and admin. skills nec. to chair a dept. with major research, teaching, and service responsibilities.   To apply, please send a vita and have at least three letters of rec. sent to Prof. Sheldon Axler, Chair Search Committee, Dept. of Math. Michigana State University, East Lansing, MI 48824.   App. and rec. letters should arrive by Dec 31, 1990. Inquiries should also be sent to the above address (or via e-mail to axler@ msu.bitnet).   The pos. of Chairperson caries a tenure at the rank of Prof. and is available on Sept. 1, 1991.   Salary is competitive and will be commensurate with qualifications.   App. are strongly encouraged from groups that are traditionally underrepresented in math.   MSU is an AA/EO Institution.

Northern Arizona University. Three or more tenure track pos. starting Aug. 1991.   All require doct. in the advertised specialty, subst. evidence of quality teaching and a record of or potential for a productive research program.   The pos. and additional req. are: (1) Assist. Prof., Geometric Theory of Dynamical Systems, especially arising from planar sys. of O.D.E.'s.   Research directions supporting an existing research focus in the dept. desired. (2) Prof., Math. Ed., commensurate record of research, leadership and exp. with teacher ed.   Research interests in use of tech.. in instruction desired but all areas will be considered.   An Assist. Prof. pos. may also be authorized. (3) ˙Assist. Prof. Stats. Theoretical background, ability to contribute to an interactive research group, and interest in consulting. Send letter and vita and three letters of reference to screening committee, Dept. of Math., PO Box 5717,

Flagstaff, AZ 86011. The screening comm. will begin reviewing app. on Jan 7, 1991. NAU is an EO/AA institution. Women and minorities encouraged to apply.

Northwestern University. Department of Mathematics 2033 Sheridan Road, Evanston, Illinois 60208-2730 Applications are invited for one or more tenure-track positions starting September 1991. Although priority will be given to young, exceptional research mathematician (no more than several years after Ph.D), more senior candidates with very exceptional credentials may be considered for a tenured position. Fields of interest to the department include Algebra, Analysis, Dynamical Systems, Probability, Partial Differential Equations, and Topology. Northwestern is an affirmative action, equal opportunity employer committed to fostering a diverse faculty, so women and minority candidates are especially encouraged to apply. Candidates should arrange that at least three letters of recommendation be sent to Chair, Personnel Committee, Department of Mathematics, Northwestern University, Evanston, Illinois 60208. In order to receive full consideration, applications should be received by January 7, 1991. Hiring is contingent upon eligibility to work in the United States.

Northwestern University. Mathematics Department 2033 Sheridan Road, Evanston, Illinois 60208-2730 The Mathematics Department will sponsor an Emphasis Year in algebraic topology, cohomology of groups, and related topics. This program will include 2-year Assistant Professorship positions starting September 1991 and possible visiting positions for more senior mathematicians for part or all of the academic year. Applications should be sent to Prof. Mark E. Mahowald at the department address and include a curriculum vitae and three letters of recommendation. In order to ensure full consideration, an application must be received by January 30, 1991. Northwestern University is an Affirmative Action/Equal Opportunity employer. Hiring is contingent upon eligibility to work in the United States.

Ohio State University. Dept.of Math. hopes to have avail. several positions, both visiting and permanent, effective Autumn Quarter 1991. Candidates in all areas of app. and pure math., including those with demon. interest in pedagogical matters, are invited to apply. Significant math. research accomp. or exceptional promise, and evidence of good teaching ability, will be expected of successful app. Send credentials and have letters of rec. sent to Prof. Dijen Ray-Chaudhuri, Dept. of Math. The Ohio State University, 231 W. 18th Ave., Columbus, Ohio 43210. Review of resumes will begin immediately. The Ohio State University is an EO/AA employer. Qualified women and minority cand. encouraged to apply.

Oregon State University. The Andreotti Assistant Professor position in mathematics will become available September 16, 1991. The Andreotti position is a tenure track position. Teaching duties consist of one course per term for the first two years. The position includes summer research support for the first two summers. It is restricted to individuals who have held a Ph.D for at most three years. Salary depends on qualifications. Closing date is December 1, 1990. Write to: Professor Bent Petersen, Chair, Staff Selection Committee, Department of Mathematics, Oregon State University, Corvallis, Oregon 97331-4605

Oregon State University. Assistant Professor Positions in Algebra, Differential Geometry, Differential Equations, Dynamical Systems, Geometric Measure Theory and other fields will become available September 16, 1991. Salary depends on qualifications. Closing date is December 1, 1990. Write to: Professor Bent Petersen, Chair, Staff Selection Committee, Department of Mathematics, Oregon State University, Corvallis, Oregon 97331-4605. Oregon State University is an Affirmative Action/Equal Opportunity Employer and complies with Section 504 of the Rehabilitation Act 1973. OSU has a policy for being responsive to the needs of dual-career couples.

Purdue University. Department of Mathematics, West Lafayette, IN 47907. Joseph Lipman, Head. Several regular or research assistant professorships beginning August 1991. Exceptional research

promise and excellence in teaching required. Send resume and three letters of recommendation, one of which addresses teaching. Purdue University is an equal opportunity/affirmative action employer. Purdue University, Department of Mathematics, West Lafayette, IN 47907. Joseph Lipman, Head. Possible position at the Associate Professor/Professor level beginning August 1991. Excellent research credentials required. Send resume and three letters of recommendation. Purdue University is an equal opportunity/affirmative action employer.

Southern Illinois University at Carbondale. Dept. of Math. App. are invited from qualified cand. for a tenure track position at the assist. prof. level beginning on Aug. 16, 1991. PhD in math. with specialization in pure or app. combinatorics, cryptography, graph theory or combinatorial designs req. Cand. must have demon. excell. in research or potential for such. Evidence of teaching effectiveness is req. Send letter of app., resume, and three letters of rec. to: Combinatorics Position, c/o Ronald B. Kirk, Chair, Dept. of Math., SIU at Carbondale, Carbondale, IL 62901. The closing date is Dec. 15, 1990 or until the position is filled. SIUC is and EO/AA employer. Women and minorities are particulary encouraged to apply.

SIUC. Dept. of Math. App. are invited from qual. cand. for a tenure track pos. at the assist. prof. level beginning August 16, 1991. PhD in math. with spec. in probability or stochastic processes req. Cand. must have demonstrated excellence in research or potential for such. Evidence of teaching effectiveness is req. Send letter of app., resume, and three letters of rec. to: Probability Position, c/o Ronald Kirk, Chair, Dept. of Math. SIU at Carbondale, Carbondale, IL 62901 The closing date is Dec. 15, 1990 or until the pos. is filled. SIUC is an EO/AA employer. Women and minorities encouraged to apply.

University of Virginia. The Dept. of App. Math. seeks new faculty member committed to teaching and research, with int. in the formulation, analysis, and solution of partial diff. equations. Such interests should intersect at least one of the three areas of expertise in the Dept.: Continuum Mechanics, Control Theory, and Numerical Analysis. Rank and salary will be commensurate with exper. and qual. The University of Virginia is an EO/AA employer. Women and minorities are especially encouraged to apply.

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Association for Women in Mathematics

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Primary Fields of Interest. Select up to five from the list on page 2.

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14 Algebraic geometry
15 Linear and multilinear algebra; matrix theory
16 Associative rings and algebras
17 Nonassociative rings and algebras
18 Category theory, homological algebra
19 K-theory
20 Group theory and generalizations
22 Topological groups, Lie groups
26 Real functions
28 Measure and integration
30 Functions of a complex variable
31 Potential theory
32 Several complex variables and analytical spaces
33 Special functions
34 Ordinary differential equations

35 Partial differential equations
39 Finite differences and functional equations
40 Sequences, series, summability
41 Approximations and expansions
42 Fourier analysis
43 Abstract harmonic analysis
44 Integral transforms, operational calculus
45 Integral equations
46 Functional analysis
47 Operator theory
49 Calculus of variations and optimal control; optimization
51 Geometry
52 Convex sets and related geometry topics
53 Differential geometry
54 General topology
55 Algebraic topology
57 Manifolds and cell complexes
58 Global analysis, analysis on manifolds
60 Probability theory and stochastic processes
62 Statistics
65 Numerical analysis
68 Computer science
70 Mechanics of particles and systems
73 Mechanics of solids
76 Fluid mechanics
78 Optics, electromagnetic theory

80 Classical thermodynamics, heat transfer
81 Quantum mechanics
82 Statistical physics, structure of matter
83 Relativity
85 Astronomy and astrophysics
86 Geophysics
90 Economics, operations research, programming, games
92 Biology and behavioral sci.
93 Systems theory; control
94 Information and communication

001 Education: K-8
002 Education: 9-12
003 Education: Undergraduate
004 Education: Graduate
005 Gender issues
006 Affirmative action
007 History of women in math sciences
008 Other (please specify):
_____

Association for Women in Mathematics
Box 178 Wellesley College
Wellesley, MA 02181
(617) 237-7517

Association for Women in Mathematics

Institutional Membership
Date..........................19...........

Please fill out this application and return it as soon as possible. Your institution will be updated on our membership list upon receipt of the completed application and payment of member dues or receipt of postal order. See below to determine which membership category you wish to choose. Subscription to the AWM Newsletter is included as part of the membership. Institutional members receive two free advertisements per year. All institutions advertising in the **AWM Newsletter** are Affirmative Action/Equal Opportunity Employers.

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Association for Women in Mathematics

NEWSLETTER

ASSOCIATION FOR WOMEN IN MATHEMATICS
Box 178, Wellesley College
Wellesley, MA 02181

SEPTEMBER-OCTOBER 1990