# Association for Women in Mathematics

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ICM SPECIAL: This issue of the *Newsletter* is appearing a little later than usual so that news of this exciting meeting will still be fresh. The report begins on page eight.
GENDER AND SCIENCE: Mary Beth Ruskai's article in the May-June issue has generated more response than any other article in *Newsletter* history. A special section will appear in the next issue.
DUES! Remember to pay your dues. Find a new member, become a contributing member. DUES!

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## PRESIDENT'S REPORT

ICM-86. 3500 mathematicians from all over the world gathered in Berkeley, California from August 3 to August 11, 1986. The mathematical level of the invited lectures at the Congress was very high. At least as important as the lectures was the chance to meet women and men from so many different places, to exchange mathematical ideas and to reinforce and build the networks which are so important to our professional lives.

AWM Panel. The AWM sponsored a panel entitled "Women in Mathematics: An International Perspective 8 Years Later." There were 9 panelists and a moderator from 10 countries and 5 continents: Josefina Alvarez-Alonso (Argentina), Lenore Blum (USA), Bodil Branner (Denmark), Marie-Françoise Coste-Roy (France), Consuelo Flores (Nicaragua), Gudrun Kalmbach (Federal Republic of Germany), Maria José Pacifico (Brazil), Jennifer Seberry (Australia), Caroline Series (England), and Josephine Guidy-Wandja (Ivory Coast).

Each of the panelists reported on her own experiences and those of women she contacted about the panel. Although the differences were striking, there was one common theme. The forces of society which make it more difficult for women to do mathematics than for men have their strongest effects early on. Once a woman has a Ph.D. the problems are *relatively* small and subtle. Economic conditions and the availability of jobs are important factors in the situation of women.

The unfortunate fact that the men who control the mathematical establishment still need constant reminders that women are active and doing excellent work was brought out in its historical perspective. Another issue which was raised was the current situation arising from the establishment of universal coeducation in the French school and university system.

Full reports from the panelists and the moderator appear in the special section.

AWM International. An exciting development at the Congress was the formation of a European affiliate of AWM and the potential formation of a South American affiliate. The European AWM will meet in Paris, December 6-7, 1986. For details, see the ICM report. Those interested in organizing a South American group should contact Maria José Pacifico, Federal University, Rio de Janeiro, Brazil.

Party. There was a reception after the panel which was one of the social highlights of the Congress. Special thanks to the local organizing committee.

Directory of Women in Mathematics. Please fill out the form so that our third edition will be complete and up to date.

Linda Keen
Department of Mathematics
and Computer Science
Herbert H. Lehman College, CUNY
Bronx, New York 10468

## OBITUARIES

Two long-time members of AWM have passed away.

Professor R H Bing of the University of Texas at Austin was an eminent researcher and teacher in the field of topology. See the August AMS *Notices* page 595 for a warm reminiscence.

Dr. Helene Braun, professor emeritus of mathematics, Universität Hamburg, died on May 15, 1986.

She was born June 3, 1914 in Frankfurt/Main. From 1933 to 1937 she studied mathematics in Frankfurt and Marburg and took her degree under the direction of C. L. Siegel. She received her Ph.D. at Göttingen in 1941 and came in 1951 to the Universität Hamburg, since 1968 as regular Professor and Successor to H. Hasse.

Her scientific interest was initially analytic and arithmetic number theory. Her work on Eisenstein series was an outstanding part of her contribution to the field. In later years her interest in algebraic questions increased, in particular in the context of nonassociative algebras. Her book on Jordan algebras, jointly written with M. Koecher, belongs to the standard literature of this area. Multiple invitations, for instance from Copenhagen, Princeton, and the Tata Institute, prove that she had acquired, as H. Hasse wrote in 1965, the reputation of a fundamental and fruitful researcher. In 1980 she was appointed to an honorary membership in the mathematical society of Hamburg.

As a woman and at the same time regular Professor of Mathematics she held a singular position. Her engagement with women questions in science was great, her interest in her students and the rising scientific generation was unsurpassed. She had felt responsible beyond this in a special way for those disciple colleagues from the Third World, that she wanted the Universität Hamburg to develop.

The University laments the loss of a scientist. International acknowledgement and esteem had fallen to her share, and in particular through her personal stake in the academy she had found many friends. They all will keep her in grateful remembrance.

(from an obituary by Dr. Peter Fischer-Appelt, President of the Universität Hamburg, and Prof. Dr. Walter Benz, Speaker of the Fachbereiches Mathematik)

## AMS ELECTIONS

As usual, candidates for contested positions in the AMS elections were asked to write a short statement for this *Newsletter*. Suggested topics were the following: women in math, minorities in math, the role of the AMS Council, promotion and tenure practices, the David report and its implications. A topic of special interest this year was the implications of DARPA and SDI funding of mathematical research.

These statements and those on the pink sheets that accompany the ballot should, we hope, help you make your electoral decisions.

This year there are two candidates for one vice-presidency. They are William P. Thurston (Princeton University) and Karen Uhlenbeck (University of Chicago).

There are ten candidates for five Member-at-Large positions. They are C. Edmund Burgess (University of Utah), David Drasin (Purdue University), H. Blaine Lawson (SUNY at Stony Brook), Howard A. Masur (University of Illinois at Chicago), Eric C. Milner (University of Calgary), Yiannis N. Moschovakis (UCLA), Linda A. Ness (Carleton College), Marc A. Rieffel (University of California, Berkeley), Scott Warner Williams (SUNY at Buffalo), and Carol Wood (Wesleyan University).

There will be eight candidates for four positions on the Nominating Committee. Only two were known at the time statements were requested: Robert L. Devaney (Boston University) and Carl Pomerance (University of Georgia). M. Salah Baouendi (Purdue University), Werner C. Rheinboldt (University of Pittsburgh), Bruce L. Rothschild (UCLA), and Frank L. Spitzer (Cornell University) were nominated too late to ask for statements. At least two more candidates will appear on the ballot.

Candidates by petition were also unknown at press time.

Members-at-Large

### C.E. Burgess

I would like to see more opportunities for young mathematicians to establish programs of research, especially during their first several postdoctoral years. Additional support is needed for study and research during summers, particularly for young mathematicians who are geographically isolated from other people in their fields of study. Also, funds are needed to lighten the teaching loads for people in their first postdoctoral appointments. With all programs of research, we need to continue efforts to bring the support for mathematics more in balance with what is available for experimental sciences and engineering.

We need programs that will enable mathematics to be more competitive in attracting capable students to pursue a study of mathematics. Financial support, at least comparable to what is available in experimental sciences, is needed for undergraduate students majoring in mathematics.

Suitable fellowships and scholarships for undergraduate students should be especially helpful in attracting more women and people from minority groups to consider mathematics as a field of study.

### David Drasin

The American Mathematical Society is the principal organization of university-research mathematicians. The profession has gone through a very difficult decade, and now that there are signs that matters may improve, I hope that the Society will use its influence wisely. While it should support mathematics in all ways, the Society has unique responsibilities to the full community. The number of teaching/research positions has not kept pace with enrollments or demand, so especially now is a good time to encourage women/minorities. There have been some successes here in recent years, even in economically hostile times. The Society should also play a more significant role in publicizing the successes of mathematics both to us and to the outside world. The accounts given in the David report are inspiring, but I wonder how many mathematicians are aware of many of the advances described there. This problem should get serious attention, and I feel it can only add to our constituency.

On the basis of present information, I am skeptical about how much special programs such as DARPA and SDI will help. There may be very temporary shots-in-the-arm for certain areas, but at the cost of skewing research goals toward political ends.

There seem to be many opportunities for mathematics and mathematicians today, but the role the AMS chooses to play will greatly determine whether this increases our overall health.

### Howard Masur

I believe a critical issue facing the AMS in forthcoming years is the implications of DARPA and SDI funding of mathematical research. SDI at best will impose a terrible strain on the resources, including the research resources, of the country and very likely a serious escalation of the nuclear arms race and the dangers that poses. The Society cannot pretend these are merely political issues in which it should not be involved. Rather they strike at the heart of the role of science and scientists in society. The Council should be involved in these issues.

### Yiannis N. Moschovakis

The main purpose of the AMS is to promote and support mathematical research and education, primarily by facilitating contact among mathematicians and between mathematicians and other scientists. The Society must also be concerned with the human, social and economic problems faced by its members, and it has the right (on occasion the duty) to speak out on important issues of public policy.

### Marc A. Rieffel

Let me add the following to the statement which I wrote for the AMS ballot.

While progress in increasing the proportion of women and underrepresented minorities holding tenured positions in mathematics departments has been fairly slow during the last decade, the large number of faculty positions expected to open up during the next decade offers an opportunity for more rapid progress. It seems to me that the main obstacle to more rapid progress is likely to be a shortage of candidates. To remove this obstacle, we need right now to more actively encourage women and underrepresented minorities to enter doctoral studies in mathematics. I will seek to have the AMS strengthen its activities in this direction.

## Carol Wood

It is simple to state what I view as the central purpose of the AMS: to support mathematical research. In the current world, however, attention must be paid to ensure that mathematical interest and talent is nurtured wherever it occurs.

As a woman mathematician, I have two particular concerns about this process at present. One is the virtually universal misunderstanding of the nature of mathematical activity, perhaps most alarmingly when it comes from some of our feminist colleagues in the social sciences. The other is the effect of the current political climate on girls and young women with mathematical aptitude. Both concerns cause me to be especially interested in the AMS's public relations efforts, which I hope will help to build accurate images of what mathematics is and who can do it.

## Nominating Committee

## Carl Pomerance

The American Mathematical Society should redouble its efforts to increase the role of women and minorities in the profession. It is clearer now than ever that with recent space failures and the continued ascension of foreign technology over our own, that the American scientific community cannot continue depriving itself of the talents of significant fractions of the population. As a member of the Nominating Committee, I will look for candidates, not only with strong mathematical credentials, but with innovative ideas for change. In addition, I will look for candidates who will not be timid about beginning an internal debate about the relationship of the AMS and the Strategic Defense Initiative.

## HONORS AND AWARDS

Mina Rees was among the five recipients of the second annual New York City Mayor's Awards of Honor for Science and Technology. She is currently Emeritus Professor of Mathematics and President Emeritus of the Graduate School and University Center at the City University of New York.

The awards were presented by New York City Mayor Edward I. Koch on Wednesday, May 7, at Gracie Mansion. A Commission for Science and Technology, established by Mayor Koch in 1984 to encourage the growth of scientific and technological activities in New York City, identifies and nominates individuals for specific achievement or for a lifetime body of work that benefits not only New Yorkers, but the rest of the country and the world, in the biological, engineering, physical, mathematical and medical sciences.

Cathleen Synge Morawetz, director of the Courant Institute of Mathematical Science at New York University was awarded an honorary Doctor of Science at the Princeton University graduation ceremonies, June, 1986. She was cited for her work as "an ingenious problem solver" in mathematics and her "guidance to students and colleagues."

Mary W. Gray, chair of the math/statistics/computer sciences department at American University and past president of AWM, was quoted in the "For the Record" section of the Washington *Post* on June 15, 1986. The quote was an excerpt from a speech she delivered to the American Association of University Professors:

> I can probably trace my advocacy career to the fact that only a couple of years into my teaching career I was told that I did not need a promotion to associate professor because my husband could support me. This was before sex discrimination in faculty employment was illegal, but it was clear to me that it was immoral and certainly a violation of appropriate academic standards. The outcome was that, although it took nearly a year, I got my promotion, and the president of the university got fired. That led me to believe that if you are right and if you fight hard enough, you win. I've since learned otherwise, but I guess that I've never stopped fighting.

...The initiatives of the last 15 years have not carried us as far as we should like. Toward 2001, what can we do, what do we want, how can we get where we want to be?

I do not envision a utopia--at least not in 15 years. I do not expect that women college and university presidents will be the norm; I do not expect that when the U.S. government turns to academe for expertise we will inevitably have a woman secretary of state or presidential science adviser. What I should hope is that having a man in each of these positions will not be the norm.

...We must think of women for leadership positions, we must--men and women--make the networking connections work to get women into academic leadership roles. ...And we must choose women for the same reasons we choose men.

Emily Nolte, 13, was awarded the first Jordan Douglas Blank Scholarship Award of Tuckahoe Middle School. The award is in memory of Blank who was killed in an accident while bicycling. "The $500 scholarship, to be awarded annually to a student with an interest in and aptitude for computer science, will pay most of the tuition for a two-week computer camp at Virginia Polytechnic Institute and State University this summer. Jordan attended the computer camp last summer." Nolte said the "the camp will enable her to do more programming with the personal computer she owns."
(quotes from The Richmond *News-Leader*, Friday, May 30, 1986)

Dr. Carolyn Eisele, Professor Emeritus, Math, Hunter College, CUNY earned The New York Academy of Sciences Award In the Behavioral Sciences - History and Philosophy of Science for 1985. The award consisted of $1,500 and a certificate of citation for her outstanding scholarship and seminal contribution to the publication of the mathematical and philosophical works of the American philosopher Charles S. Peirce. Her long and extraordinary career has been distinguished by her many contributions in the fields of history and philosophy, and most particularly by her appreciation of the importance of mathematics in the behavioral sciences.

Professor Eisele has written and edited a number of works on the mathematics and philosophy of Peirce. Write Mouton Publishers, 200 Saw Mill River Road, Hawthorne, NY 10532 for more information.

## CBMS COMMITTEE ON GRADUATE ENROLLMENT

The Conference Board of Mathematical Sciences (a consortium of mathematics organizations, including AWM), has appointed a Committee on American Graduate Mathematics Enrollment comprised of Joe Kohn, Betty Lichtenberg, Willard Miller, Paul Sally and Barry Simon (Chair). The resolution creating this Committee includes the following:

Whereas, there has been a great deal of discussion on the lack of U.S. citizens in our graduate programs and the impact of this on our future research programs, technology, and education. The charge to the committee is to:

1) obtain concrete facts and, if need be, anecdotal data, on graduate enrollments for the mathematical sciences; and, if possible, compare them with enrollments in other scientific fields;

2) present the mathematical community's perception of this problem;

3) explore the significance of this data for the future of American mathematics and sciences; and consequently on research technology, defense and education;

4) make recommendations to the mathematical community and the country on how to encourage our talented American youth to pursue a career in the mathematical sciences.

The Committee solicits comments from members of the mathematical community. They may be addressed to: Professor Barry Simon, CBMS Committee on American Graduate Mathematics Enrollment, Mathematics Department, 253-37, California Institute of Technology, Pasadena, CA 91125. To be most useful to the committee, your comments should arrive before December 1, 1986.

REPORT OF THE TREASURER                                      June, 1986

Accounting for the period June 1, 1985 to May 31, 1986
Balance as of June 1, 1985............................$37,826.19
   Total Assets, June 1, 1985                        $37,938.07
   Note:  The figure $37,938.07 represents $37,826.19 cash-on-hand plus
5 shares of Washington Water Power, valued at $111.88 as of 5/31/79.

RECEIPTS
| | |
|---|---:|
| Dues–Individuals | $13,870.00 |
|    Families | 1,020.00 |
|    Institutional | 5,520.00 |
| Kovalevsky Symposium | 1,059.95 |
| NSF Grant for Research Component of Kovalevsky Symposium | 11,678.00 |
| Digital Grant for High School Component of Symposium | 5,000.00 |
| Mitre Grant for High School Component of Symposium | 1,000.00 |
| Arthur D. Little Grant for H.S. Component of Symposium | 1,000.00 |
| Pfizer Grant for AWM | 1,000.00 |
| Contributions – 15th Anniversary of AWM | 3,792.37 |
| Interest | 2,522.05 |
| Advertising Fees | 995.00 |
| Returned Speakers' Bureau Honorarium | 125.00 |
| Miscellaneous | 388.67 |
| TOTAL RECEIPTS...........| $48,971.04 |

EXPENSES
| | |
|---|---:|
| Wages & FICA (1) | 8,822.22 |
| Newsletter (2) | 7,952.98 |
| Dues & Fees (3) | 312.00 |
| Operating Expenses (4) | 1,936.18 |
| Speakers' Bureau (5) | 5,410.13 |
| Raytheon Grants(6) | 3,425.53 |
| AWM National Meetings | 1,937.30 |
| Research Component of Kovalevsky Symposium | 11,700.00 |
| High School Component of Kovalevsky Symposium | 3,720.58 |
| Contribution to ICM | 200.00 |
| Massachusetts Income Tax | 117.98 |
| Miscellaneous | 28.00 |
| TOTAL EXPENSES...........| $45,562.90 |

BALANCE as of May 31, 1986.......................................$41,234.33

(1)  Part-time Administrative Assistant
(2)  Typing, postage and printing
(3)  Conference Board of the Mathematical Sciences, Massachusetts Incorporation Fee, Dept. of Public Charities
(4)  Postage, phone, supplies, duplicating
(5)  Wages for clerical help; phone, postage and duplicating expenses; travel, accommodations, and honorarium for speakers
(6)  Grants to women high school teachers to learn Pascal and/or data structures

Membership Statistics:  Our membership currently totals 1583.  The breakdown of this membership into membership categories is as follows: 1167 individual women, 120 individual men, 55 family-women, 55 family-men, 186 institutional. Of the total individual members, 53 are foreign, and of the institutional members, 7 are foreign.

We have used up the entire Sloan Grant for the Speakers' Bureau.  Therefore, until we obtain another grant for the Speakers' Bureau, there will be no honorarium given.  Speaker's travel and accommodations will continue to be covered according to the guidelines, as they have been in the past.  We had 40 Speakers this past year.
The only major expense for which we have not yet been billed is the computer in the AWM office, which is $4475.00.

Respectfully submitted,
Lynnell E. Stern, Treasurer of AWM,
Bolt Beranek & Newman Communications Corporation

## BUNTING FELLOWSHIPS

The Bunting Fellowship Program is sponsored by the Mary Ingraham Bunting Institute of Radcliffe College to enable women to pursue independent study in academic or professional fields, in creative writing, or in the arts. Appointments are full-time for the year 1 July through 30 June and require residence in the Boston area during the term of appointment. Fellowships include a stipend, office or studio space, auditing privileges, and access to the libraries and other resources and facilities of Radcliffe College and Harvard University. The stipend for the 1987-1988 year will be $16,000.

The selection of a fellow is based on evidence that the year at the institute will make a significant difference in her professional life and that the project will make an important contribution to her field. Fellows may be at various levels of career development, from early postdoctoral to senior professional ranks. Applicants must have received their doctorates before 30 June 1985. Applicants in creative writing, the visual arts, or music are expected to be at an equivalent stage in their professional development. Former institute fellows may apply if their previous fellowship year was 1982 or earlier.

The application deadline for 1987-88 is 15 October 1986; the application fee is $30. Announcement will be made in May 1987. Address inquiries and requests for application forms to the Bunting Fellowship Program, Bunting Institute, Radcliffe College, 10 Garden St., Cambridge, MA 02138. (617) 495-8212.

## NSF INFO

### Visiting Professorships for Women

The Visiting Professorships for Women program was instituted to provide opportunities for women to advance their careers in the disciplines of science and engineering and to provide greater visibility and wider opportunities for women scientists and engineers employed in industry, government and academic institutions. In providing support for the program, NSF is addressing the need to make full use of the scientific and technical resources of the nation.

Proposals will compete for awards on the basis of the scientific merit of the proposed research and a specific plan for lecturing, mentoring and counselling activities. The deadline for applications is October 1, 1986, with a scheduled announcement of awards April 15, 1987. For further information about guidelines and eligibility requirements, write to the Visiting Professorships for Women Program, NSF, Washington, DC 20550.

### Positions Open in NSF

NSF's Division of Mathematical Sciences is seeking qualified applicants for positions which periodically become available. Incumbents will be responsible for the planning, coordination, and management of basic research activities primarily through Federal grants and contracts to academic institutions and nonprofit, nonacademic research institutions. A broad, general knowledge of the field and some administrative experience are required. For technical information about the position, contact Dr. John C. Polking, Director, Division of Mathematical Sciences, NSF. (202)357-9669.

## INDEX OF WOMEN SCIENTISTS

*Women Scientists from Antiquity to the Present: An Index* by Caroline L. Herzenberg is an important new reference work for women's studies and history of science collections. An international reference listing and biographical directory of some notable women scientists from ancient to modern times, it features over 2500 individual entries, including about 200 women mathematicians (mostly from the past, but some present-day); biographical information for each scientist listed; bibliography and source abbreviation key leading the reader to approximately 130 works for further research; and a comprehensive index of women scientists rearranged according to fields of specialization.

Caroline Herzenberg is a physicist who has achieved prominence in several different areas of scientific work. She recently received international attention for a study identifying the capability of

"Star Wars" lasers for incendiary attack against cities with consequences including massive firestorms and the possibility of nuclear winter. Earlier, she was a principal investigator in the NASA Apollo returned lunar sample analysis program, and worked with the first moon rocks brought to earth. Dr. Herzenberg holds degrees from both M.I.T. and the University of Chicago. At present she is a physicist on the staff of Argonne National Laboratory where she works on programs in fossil energy and nuclear reactor safety. Dr. Herzenberg has an active interest both in current issues relating to women in science and in the history of women in science. She is currently president-elect of the Association for Women in Science.

The index costs $30. Direct all orders or inquiries to: Locust Hill Press, Goshen-Sharon Turnpike, West Cornwall, CT 06796.

## WOMEN, HEALTH AND TECHNOLOGY CONFERENCE

The Women and Technology Project at The University of Connecticut is sponsoring a conference on October 23, 1986. Paper sessions will focus on women as they affect and are affected by technology in occupational and health care settings. Keynotes are Judy Norsigian of the Boston Women's Health Book Collective, authors of *Our Bodies, Ourselves*, and Evelyn Fox Keller, author of *Reflections on Gender and Science.*

The conference is supported in part by contributions from Connecticut PEER, Richardson Vicks, Xerox and The University of Connecticut Professional Employees Association, an affiliate of the Connecticut State Federation of Teachers.

For registration information, write: Women, Health and Technology Conference, Non-credit programs, One Bishop Circle, Box U-56D, Room 128, University of Connecticut, Storrs, CT 06268; (203) 486-3231.

## OF POSSIBLE INTEREST

The National Women's Studies Association, in co-sponsorship with Spelman College, Agnes Scott College, and Emory University, is proud to announce its ninth annual conference, "Weaving Women's Colors: A Decade of Empowerment." This conference on the intersection of race and gender will convene at Spelman College from June 24-28, 1987.

The conference theme reflects the diversity of our membership and our continuing need to explore issues that arise at the intersection of race and gender. We are women from a vast variety of backgrounds, communities, and traditions, working to understand our origins and the forces that have shaped our current circumstances; to expand our control over all aspects of our lives; to explore our similarities, our differences, and our common interests; and to confront the inequities, injustices and oppressions that impede the realization of our fullest empowerment. It is to Spelman College, founded in Atlanta, Georgia in 1881 for the education of black women, that NWSA takes this theme for our tenth anniversary and ninth annual conference. Spelman is a women's world. It was founded by two women who believed in the freeing power of the mind--a power not limited by sex, race, or class. For over one hundred years Spelman College has provided an extraordinary experience for women in the United States and throughout the world. It is within this special setting that the women of NWSA will weave our spirit, life, and meaning with our southern, national, and international experiences.

Write: NWSA '87, P.O. Box 21223, Emory University, Atlanta, GA 30322.

*Virginia Woolf and the Politics of Style* by Pamela J. Transue. SUNY Press, State University Plaza, Albany NY 12246.

Women's Studies. The University of Michigan Press, 839 Greene St., P.O. Box 1104, Ann Arbor, MI 48106.

Women's Studies. Greenwood Press, Inc., 88 Post Road West, Box 5007, Westport, CT 06881.

# AWM/ICM-86 REPORT

## WOMEN IN MATHEMATICS: AN INTERNATIONAL PERSPECTIVE, EIGHT YEARS LATER

AWM panel held at the International Congress of Mathematicians, University of California, Berkeley, August 6, 1986

### REPORT BY LENORE BLUM, MODERATOR

The panel was organized by Bhama Srinivasan, Evelyn Silvia and me, with assistance from Linda Keen, AWM president. The 9 panelists were Josefina Alvarez (Argentina), Bodil Branner (Denmark), Marie-Françoise Coste-Roy (France), Consuelo Flores (Nicaragua), Gudrun Kalmbach (Federal Republic of Germany), Maria José Pacifico (Brazil), Jennifer Seberry (Australia), Caroline Series (England), and Josephine Guidy-Wandja (Ivory Coast). Their statements will be printed in this and subsequent issues of the *Newsletter*. (A news article on the panel appeared on August 7 in *The San Francisco Examiner*.)

About 400 people filled the Physical Sciences Lecture Hall at UC Berkeley for the panel discussion, and afterwards, most attended our party in the Mathematics Commons Room on the tenth floor of Evans Hall. Special thanks to Lisa Goldberg for arranging a party complete with food, drinks and music that lasted well into the night and was enjoyed by all.

The title of the panel refers to the fact that our last panel at an International Congress was held in Helsinki in 1978. The panelists were asked to discuss changes in, as well as the current status of, women in mathematics in their countries. (In brief, from the reports, change during the past 8 years seems to be minimal; the relative situation of women in Central and South America seems somewhat better than in the US, Western Europe, Australia and Africa.)

In addition, 3 issues of immediate concern were addressed during the session:

1) the (lack of) participation of women in the ICM,

2) concern about the effect on women in mathematics in France due to the recent merging of the Ecoles Normales Supérieures, and

3) formation of an international AWM.

I will elaborate on these issues.

1) At Helsinki in 1978, there were no women speakers. This issue became the focus of the AWM Helsinki meeting. By a voice vote of the 400 people attending that meeting, the following resolution was passed:

> We note the absence of women from the list of invited speakers at the 1978 ICM, from the IMU [International Mathematics Union] General Assembly, and from the IMU Committee, despite the large number of internationally distinguished women mathematicians; and we urge that this situation be rectified by the 1982 ICM.

Apparently this resolution had a positive effect, for at the next Congress in Warsaw, 4 women were invited to speak.

However, when the preliminary list for the 1986 Congress came out, there were no women in research mathematics. Unfortunately, in our earlier resolution, we had just asked that the situation be rectified in 1982 but had neglected to specify "and thereafter", and apparently the Committee took us literally. It had to be brought to the attention of the IMU in 1986 that there was an obvious omission. A list of 25-30 highly qualified women in a number of fields was provided to the Executive Committee of the ICM. We are pleased to note that subsequently, 3 women research mathematicians were on the final program.

One of the reasons this is a continuing problem is that there are no women involved in the selection process, and the men involved, unfortunately, are not sufficiently sensitive to the issues. The situation gets perpetuated even more, since the people who make the decisions for future Congresses are drawn from a pool of past speakers.

So, despite the fact that more and more women are actively involved in mathematics, we can't take it for granted that we will naturally be invited to speak as our numbers warrant.

Linda Keen, AWM president, read a resolution she had earlier presented to the ICM Executive Committee concerning the selection of women (and also members of other groups) as ICM speakers. This resolution was endorsed by a near unanimous vote of the 400 attendees at the panel (see Attachment 1).

In addition, as a personal protest against ICM policies concerning women, Marina Ratner, Professor of Mathematics at UC Berkeley, took the more extreme position of boycotting the Congress (see Attachment 2).

2) A critical, and potentially disastrous, development to the future of women in mathematics in France was brought to our attention by Adrien Douady. This situation is discussed in more detail by panelist Marie-Françoise Coste-Roy. In brief, the French Ecoles Normales Supérieures produce a large fraction of French research mathematicians. Until now, there were separate ENS's for men and for women, with separate entrance exams. This separate system has been credited by many mathematicians, including the women who have themselves come through it, with providing the foundation that has produced a significant number of strong women researchers. This year, the ENS's, and the exams, have merged--and true to dire predictions, only 3 of the entering class of 46 will be women. (Previously there were approximately 17 women out of a total of 47.) Clearly, this situation poses a difficult and complex set of issues. Douady advocates a quota system, as does Coste-Roy. They both requested comments from the audience. As a result of the discussion, a resolution was passed noting the development, and suggesting that great care be taken to ensure that the strength of the former tradition not be lost. (See Attachment 3 for the English version. The French version plus Douady's letter is contained in Coste-Roy's report.) In addition, a group of French mathematicians met after the panel to form a group that would monitor developments.

I would like to make two points which, I believe, bear directly on this issue, particularly if entrance exams are the main determining factor for admittance into the ENS:

1) for the large part, boys and girls have had vastly different mathematical experiences and training, by the time they have completed high school, and

2) college entrance exams, particularly in mathematics, underestimate the future performance of females.

To expand on the first point, I refer to the article "Britain's Royal Society Condemns Sex Bias in Math Teaching", which appeared in *Science* magazine (vol. 233, 8 Aug., 1986, pp. 618-619) two days after our panel. The article discussed a report prepared jointly by the Royal Society and the Institute of Mathematics and its Applications. According to *Science*, the report says that "the main reason for the difference in [mathematics] performance lies more in the attitude of parents, teachers, and examination boards who continue to portray mathematics as a 'male' subject. ...Problems begin in primary schools, ...where boys and girls achieve the same overall performance in mathematics but 'both teachers and pupils regard mathematics as a subject at which boys are likely to achieve higher overall performance than girls, and teaching styles and expectations are modified accordingly.' The trend is reinforced at secondary schools where teachers 'unconsciously project a prejudice against girls by rewarding only achievements that are appropriate to the pupil's sex.' ...Other barriers include orientation of examination questions towards males, [and] the fact that most heads of mathematics departments in schools are men..." (see Attachment 4 for more on this).

I have discussed this article with Caroline Series, and she will try to get a copy of the full Royal Society report for us. Clearly, this is a document that is relevant to the French situation, particularly if one wishes to assess the effect of changing the entrance criteria for institutes of higher learning without having already changed the teaching of mathematics, in both obvious and subtle ways, at earlier stages in the educational process.

The second point was made in informal discussions I had after the panel with a number of people, in particular, with Sue Montgomery. I subsequently contacted Dr. Elizabeth Scott, Professor of Statistics at UC Berkeley, and former head of the Department. She has been extensively involved in studies to ascertain the predictive value of various entrance criteria at Berkeley, UCLA, and, indeed, the whole University of California (UC) system. She generously supplied me with tables from the UCLA study, along with a discussion and analysis of the data (see Attachment 5). The conclusions drawn are that "SAT [Scholastic Aptitude Test] scores, especially math SAT, underestimate the

performance of females in college. Not only freshman GPA [grade point average], but also sophomore, total, probability of graduating, probability of staying in, etc. ...any other measure."

While these are results for students in the UC system, analogous studies with analogous results are a clear possibility for the French system.

Finally, the most obvious and compelling substantiation comes from the success of the previous system itself, which undeniably produced significant numbers of strong women mathematicians.

It would seem that more balanced entrance criteria for the ENS are warranted and would be advantageous to all. In addition, the clear benefits derived from the former dual system which provided a supportive environment for women should be noted and somehow incorporated into the new system.

3) One of the most exciting outcomes of the panel and meeting was an increased feeling of internationalism and plans to form affiliate chapters of the AWM around the world. A preliminary working meeting to discuss plans to form a European branch will be held in Paris in December (see Attachment 6). In addition, several others attending the meeting identified themselves as AWM contacts for their countries (see Attachment 7). I would suggest that people interested in forming AWM chapters in their country or region submit their names, addresses and a few sentences to Anne Leggett, editor of the AWM *Newsletter*, for publication in a special international column of the *Newsletter*.

Although our panel was large, we had no representatives from a large part of the world, indeed, from Eastern Europe through Asia. This lack presented a clear void in our view of the worldwide picture, and was a result of our previous nominal contacts with women from this part of the world: after our initial invitations to speakers from Hungary and Japan were declined, we simply did not have a ready list of additional names to draw from. It is not premature to make efforts to rectify this situation for the next ICM in Japan in 1990. I would suggest we start now to compile a list of potential panelists for the next Congress. Please submit your suggestions to me (Mathematics and Computer Science Department, Mills College, Oakland, CA 94613, or Mathematics Department, UC Berkeley, Berkeley, CA 94720).

## ATTACHMENTS

Attachment 1: AWM Resolution Concerning the Participation of Women in the ICM

Whereas scientific quality is and should be the foremost consideration in the selection of individual speakers at International Congresses, the full list of invited speakers should take into account the facts that:

mathematics is a broad umbrella for a variety of subfields;

there are many women with very high mathematical qualifications;

good mathematics is done in very many countries of the world.

Therefore, be it resolved that the program committees for all future Congresses should represent this mathematical and geographic breadth as well as both sexes and be instructed to keep the above in mind as they perform their work.

Attachment 2: Why I am boycotting the ICM-86

To: All mathematicians
From: Marina Ratner

Since the founding of the International Congress its leadership has conducted a *de facto* "female free" policy. For the half century from 1932 (when Emmy Noether was the first woman to address the Congress) through 1978 no more than four women research mathematicians were invited to speak at

the Congress (this includes both plenary and sectional talks). In 1978 at Helsinki this situation was discussed and condemned. As a result, four women were invited to speak in 1982.

This year, however, the organizers of the congress seem to have reverted to the old "men only" policy: when invitations were *first* issued *no women* were on the list of speakers in research (there were two in history and education). Only *after* protests reached the organizers were three women researchers invited.

I do not claim that at the present time there are as many women mathematicians who merit invitations as there are men (why this is so remains to be understood, but it in no way implies that women are intrinsically inferior to men in mathematics). I also oppose any kind of quota system to equalize representation from different groups of people, including women. I strongly believe that the selection of speakers should be based solely on scientific accomplishments.

This has not been so with regard to women mathematicians. Let me assure you that there are quite a few whose outstanding accomplishments place them at the very top of their fields. But they have never been invited by the selection committee, even when strongly recommended by their colleagues, while some men with lesser accomplishments have been.

Now I wish to address the conscience of the mathematical community. Why has this situation been tolerated for so many years? Why has the majority never uttered a word of protest or even simply asked why women are almost never invited?

In response to this question, some have expressed disbelief that there is prejudice against women (if the problem does not exist, there is no need to act). Others misconceive the facts as due to ordinary "politics" and "incompetence" on the part of the selectors. Let me point out that the latter, though bad enough, would be injustices of a *professional* nature, while discrimination against women is far more intolerable, because it is based on ingrained *biological* prejudices left from barbaric times. Silence, indifference and the common attitude of noninvolvement promotes this injustice even further.

I call upon all of you to raise this issue with the organizers of the ICM-86 (Moser, Hirzebruch, Gleason and others).


Attachment 3: AWM's Resolution Concerning the Merging of the French ENS

Whereas the number of women admitted into Ecole Normale Supérieure has sharply declined since the merging of the Ecole Normale Supérieure de Sèvres and Ecole Normale Supérieure de la rue d'Ulm and the administration of one competitive entrance exam,

Whereas the former Ecole Normale Supérieure des Jeunes Filles served a critical role in the training of a significant number of women mathematicians in France,

Be it resolved that great care should be taken to ensure that the continuity of this former tradition is not lost.


Attachment 4: Britain's Royal Society's Report on Sex Bias in Math Teaching and Exams

According to a recent article in the News and Comment section of *Science* magazine (vol. 233, 8 August 1986, pp. 618-619),

Britain's top scientific body, the Royal Society, has found "no convincing or conclusive evidence" that the poor performance of girls relative to boys in mathematics can be adequately explained by differences in innate ability. The conclusion is contained in a report prepared jointly by the society and the Institute of Mathematics and its Applications that has just been published in London.
In contrast to those who put forward genetic explanations, the report says that the main reason for the difference in performance lies more in the attitude of parents, teachers *and examination boards* [emphasis added] who continue to portray mathematics as a "male" subject. The result, it says, is that many girls deliberately underachieve in mathematics, adopting a negative attitude toward the subject and associating success in mathematics with an "undermining of their femininity."

The report goes on to point out that problems begin in primary school

where boys and girls achieve the same overall performance in mathematics, but "both teachers and pupils regard mathematics as a subject at which boys are likely to achieve a higher overall performance than girls, and teaching styles and expectations are modified accordingly."

The trend is reinforced at secondary schools, where teachers "unconsciously project a prejudice against girls by rewarding only achievements that are appropriate to the pupil's sex." For example, girls are rewarded for doing well on computational tasks, which they are generally found more capable of at a certain stage in their development, but in contrast boys are rewarded for solving problems.

Other barriers include the orientation of examination questions toward males [and] the fact that most heads of mathematics departments in schools are men... .

Attachment 5: Math Entrance Exams (SAT's) Underestimate the Performance of Females in College

Note: Most US high school students planning to enter a major US college or university take the math and verbal Scholastic Aptitude Tests (SAT's) as well as 3 subject achievement tests designed by the College Entrance Examination Board of the Educational Testing Service, Princeton, N.J. The scores on each test range from a low of 200 to a high of 800.

Table 7. The mean test scores and GPA's of admission groups (UCLA applicants for Fall '77), each group being further classified according to sex.

| Admission Criterion | | TOTAL | | | MALE | | FEMALE | |
|---|---|---|---|---|---|---|---|---|
| | | MEAN | N | %missing | MEAN | N | MEAN | N |
| Regular Admits (4292) | Best SAT math. | 558.23 | 4147 | 3.38 | 597.53 | 1975 | 522.50 | 2172 |
| | Best SAT verbal | 493.20 | 4147 | 3.38 | 500.37 | 1975 | 486.68 | 2172 |
| | Best Achiev. total | 1555.18 | 4019 | 6.36 | 1610.74 | 1907 | 1505.00 | 2172 |
| | Freshman GPA | 2.83 | 2695 | 37.21 | 2.82 | 1266 | 2.84 | 1429 |
| | High school GPA | 3.66 | 3237 | 24.58 | 3.65 | 1507 | 3.67 | 1730 |
| CEEB+ 3.0-3.09 (41) | Best SAT math. | 571.46 | 41 | 0.00 | 607.31 | 26 | 509.33 | 15 |
| | Best SAT verbal | 521.71 | 41 | 0.00 | 504.62 | 26 | 551.33 | 15 |
| | Best Achiev. total | 1628.00 | 40 | 2.44 | 1617.69 | 26 | 1647.14 | 14 |
| | Freshman GPA | 2.65 | 32 | 21.95 | 2.52 | 22 | 2.93 | 10 |
| | High school GPA | 3.04 | 41 | 0.00 | 3.04 | 26 | 3.04 | 15 |
| CEEB (235) | Best SAT math. | 650.88 | 226 | 3.83 | 664.26 | 148 | 625.51 | 78 |
| | Best SAT verbal | 610.75 | 226 | 3.83 | 610.95 | 148 | 610.38 | 78 |
| | Best Achiev. total | 1866.73 | 226 | 3.83 | 1888.44 | 147 | 1826.33 | 79 |
| | Freshman GPA | 2.99 | 33 | 85.96 | 2.95 | 27 | 3.19 | 6 |
| | High school GPA | 3.25 | 38 | 83.83 | 3.23 | 31 | 3.36 | 7 |
| Special Action (253) | Best SAT math. | 421.11 | 217 | 14.23 | 445.14 | 111 | 395.94 | 106 |
| | Best SAT verbal | 381.94 | 217 | 14.23 | 385.32 | 111 | 378.40 | 106 |
| | Best Achiev. total | 1255.21 | 186 | 26.48 | 1274.65 | 86 | 1238.50 | 100 |
| | Freshman GPA | 2.33 | 162 | 35.97 | 2.31 | 97 | 2.36 | 65 |
| | High school GPA | 3.01 | 253 | 0.00 | 3.02 | 140 | 2.99 | 113 |
| Non-Admits (1134) | Best SAT math. | 455.15 | 845 | 25.5 | 494.18 | 392 | 421.37 | 453 |
| | Best SAT verbal | 401.20 | 844 | 25.6 | 412.07 | 391 | 391.81 | 453 |
| | Best Achiev. total | 1258.52 | 580 | 48.9 | 1292.88 | 281 | 1226.22 | 299 |
| | High school GPA | 3.18 | 26 | 97.7 | 3.19 | 12 | 3.17 | 14 |

Table 8. The mean test scores and GPA's of regularly admitted California resident freshmen (UCLA regularly admitted California resident and *bona fide* freshmen who applied for Fall '77 and who registered for at least one quarter of the 1977-78 academic year), divided according to sex (2942 cases)

|  | All | | | Males | | Females | |
|---|---|---|---|---|---|---|---|
|  | N | mean | %missing | N | mean | N | mean |
| H. School GPA | 2890 | 3.65 | 1.77 | 1346 | 3.64 | 1544 | 3.65 |
| Math SAT | 2888 | 557.4 | 1.84 | 1337 | 598.0 | 1551 | 522.5 |
| Verbal SAT | 2888 | 505.7 | 1.84 | 1337 | 513.3 | 1551 | 499.3 |
| Total Best Achiev. Scores | 2812 | 1566 | 4.42 | 1295 | 1624 | 1517 | 1516 |
| Freshman GPA | 2939 | 2.75 | 0.10 | 1364 | 2.74 | 1375 | 2.75 |

Table 9. Stepwise regression equations for Freshman GPA (UCLA regularly admitted California resident and *bona fide* freshmen who applied for Fall '77 and who registered for at least one quarter of the 1977-78 academic year) by sex separately, predicted by high school GPA, Verbal SAT, Math SAT, and Total Best Achievement Scores

| Group (no.) | Variable entered | | Coefficient | $R^2$ | Adjusted $R^2$ | Intercept |
|---|---|---|---|---|---|---|
| All |  | 1) TBACH | 0.0020 | 0.19 | 0.19 | |
|  | 2) | HSGPA | 0.7399 | 0.26 | 0.26 | |
| (2768) | 3) | BSATV | 0.0007 | 0.27 | 0.27 | -1.3934 |
| Males | 1) | TBACH | 0.0029 | 0.20 | 0.20 | |
|  | 2) | HSGPA | 0.7446 | 0.27 | 0.27 | |
| (1278) | 3) | BSATM | 0.0001 | 0.27 | 0.27 | |
|  | 4) | BSATV | -0.0001 | 0.27 | 0.27 | -1.5637 |
| Females | 1) | TBACH | 0.0016 | 0.21 | 0.21 | |
|  | 2) | HSGPA | 0.6619 | 0.27 | 0.27 | |
| (1490) | 3) | BSATV | 0.0011 | 0.28 | 0.28 | |
|  | 4) | BSATM | 0.0004 | 0.28 | 0.28 | -1.2258 |

14 August 1986

This is taken from a series of reports on alternative admission possibilities. I have taken this one from the UCLA students, but similar conclusions apply to all campuses. We did Berkeley first, then UCLA, then all UC.

Perhaps this is the sort of information you want. I enclose three tables. Table 7 shows the mean test scores and Grade Point Averages (GPA's) of students admitted to the University of California who gave UCLA as their choice of campus. The successive blocks correspond to the different ways of being admitted. Regular is the usual way (taking proper courses in high school with good average grades plus doing well enough on the total SAT; eligibility is based on weighted average of high school GPA in academic subjects plus total SAT score). A few students do so well on the Educational Testing Service Achievement tests (CEEB) that they can enter on this score alone, some come in on Special Action (sports, etc.), and some are non-Admits. You will notice that the numbers N are not the same. In particular, many students who are admitted never come and so have no Freshman GPA. Table 8 gives information for students who actually registered that year at UCLA.

In both tables you will see that males and females have nearly the same high school GPA (females a little higher), and similarly for freshman GPA (at UCLA). However, males are doing much better on the Math SAT by 70 points or more. They are doing somewhat better on the Verbal SAT by some 15 points. All of this is on the average. We can show a more detailed analysis giving the same conclusions. SAT scores, especially Math SAT, underestimate the performance of females in college. Not only freshman GPA but also sophomore, total, probability of graduating, probability of staying in, etc., ...any other measure.

A more complex analysis is shown in the third table enclosed. Here, we are using stepwise regression to predict the freshman GPA of a student. You will see that Math SAT score is the third predictor to enter for males and the fourth for females. It does not help to improve $R^2$ enough to talk about, that is, Math SAT score does not help in "explaining" the variability among students in so far as predicting freshman GPA. The best typically is TBACH which is the Achievement test score (total best achievement). If we include some more unusual predictors, such as high school activities of different kinds, we find that Math SAT goes even farther down the list.

Elizabeth L. Scott

Attachment 6: European Branch of AWM

As a result of the panel discussion at ICM-86 on the situation of women mathematicians in different countries, it was decided to form a European branch of AWM. A preliminary working meeting to discuss the form which this organisation should take will be held in Paris, probably from December 6th-7th, 1986. Anyone who would like to participate in this meeting, who has suggestions relating to the organization, or who would be interested in joining should contact one of the following:

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The Mathematical Institute
The Technical University of Denmark
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Denmark
(Bitnet: MAIBB@NEUVMI)

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Marie-Françoise Roy
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France

Attachment 7: Additional AWM International Contacts

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## PANELISTS' REPORTS

### Josefina Alvarez, Argentina

In their relationship with the University as students or professors, women find in Argentina the same difficulties and possibilities that their man colleagues find. There are no limitations in the University itself.

However, economical problems make the situation quite difficult - certainly not only for women - for study. As a consequence of this, most of the members of the University belong at least to the medium class.

Also, it is not usual for an average family to encourage women to go into the University and, even more, into the School of Sciences.

In spite of these difficulties, any Ph.D. program in Mathematics has at least 35% women. More than 40% of the teaching positions are occupied by women.

While the society still needs some adjustments, the University and the man colleagues are ready to accept the equal participation of women.

### Bodil Branner, Denmark: to appear

### Marie-Françoise Coste-Roy, France

I shall try to express the ideas and feelings of 50 French mathematician women who have answered a quick enquiry that I sent to women in the Société Mathématique de France (150 women, about 10% of the members).

40 of these 50 women considered meeting as useful or crucial.

(A) Description of the situation of women in mathematics in universities and research centers.

I do not have precise statistics, but I use the answers to my enquiry.

There are less than 10% of women full professors and research directors, sometimes 0%.

Women have about 25% of the permanent positions in mathematics. But for assistantships, this number is under 20%. The reasons may be the smaller number of positions when compared with the

situation 15-20 years ago and the fact that the assistantships are often offered to foreigners from developing countries where few women study mathematics.

In the Centre National de la Recherche Scientifique the mathematical commission has had the policy of carefully watching the number of women taken. The proportion is about 15% to 20% (2 or 3 of 14 positions). But one can notice that often several women are among the first rejected candidates.

In research groups, the proportion of women varies from 0% to 50%.

Women who answered my enquiry have a standard family situation: 1.9 children per woman, about the French average.

The handicaps to be a woman in mathematics they quoted are the following:
- problems in advancing along a normal career path
- lack of confidence in one's own ability and psychological problems
- child care and family problems.

Some advantages are noted: easy invitations, more contacts.

(B) Situation in secondary schools and among students

There are 30% girls in classes with higher mathematical level at 17, 18. They are only 17% the year after in the classes préparatoire aux grands écoles, leading to the most prestigious schools (Ecole Normale Supérieure, Ecole Polytechnique) and to engineering.

Coeducation - nearly systematic in France for more than fifteen years - has not represented progress for the choice of scientific programs by girls.

In the two first years of the university, in sciences, girls are from one-half to one-third, in the maîtrise de mathématiques from 20% to 50%, in the preparation for teaching from 60% to 80%. About 10% of research students in mathematics are girls.

A famous competitive examination, the agrégation de mathématiques, leading to professorship at a high level in secondary school and generally taken by future math researchers, used to be separate for men and women. After the merging of the two exams in 1976, the proportion of women taken changed from 60% to 25%.

Another more important problem of the same kind is happening this year with the merging of the Ecole Normale Supérieure (rue d'Ulm) and the Ecole Normale Supérieure de Sèvres.

Let me read a letter on this subject by Adrien Douady.

Dear women in math,

In France, most mathematicians (Professors, CNRS researchers) are produced by the ENS (Ecoles Normales Supérieures). I would say the proportion is approximately 75%. Until recently, there were separate ENS for boys and girls. The 2 main ones were ENS Ulm for boys and ENS Sèvres for girls. This year these 2 are merging together (*fusion*).

You enter ENS by a contest (*concours*) that you take two years after the Bac (which is normally the end of high school). In math, there used to be approximately 30 positions for ENS Ulm and 17 for ENS Sèvres. This year the first undiscriminated contest took place. It gave the following results: boys 43, girls 3. So the merging, which was intended to be an anti-discrimination step, ends up in fact being just the suppression of the ENS Sèvres.

Now we just cannot avoid asking the following question: should we advocate for a quota? "We" means the French mathematical community, and more specifically the Math. Dept. of the ENS. I am in favor of a quota (in spite of the clearly dangerous aspects of such a system), because I think doing nothing would lead in 15 years to the disappearance of women from the French mathematical community.

I think it is the role of your association to take a position on such a problem, which is concrete but difficult.

I would like to give my personal opinion on this subject. I consider that in this particular situation quotas are necessary. I would like to give two additional arguments.

1. During their years at the Ecole Normale, students receive a fellowship. There are no special exams in this school; they pass exams at the university as well as prepare competitive exams, which are common to both men and women. But they have the benefit of good working conditions and a special training. I think that these conditions are very important for women, as well as for men whose parents are not wealthy.

2. Some quotas exist in France, to protect the number of men teaching in primary schools. Everybody considers that it is important that young children be educated by men as well as women when they are young. Is it not important to get women teaching at a high level and doing research?

I think anyway that the correct answer to this problem has to be found in France and I propose for vote the following Resolution:

Considérant que le nombre de femmes admises à l'Ecole Normale Supérieure en mathématiques a brutalement décrû avec la fusion de l'Ecole Normale Supérieure de Sèvres et de l'Ecole Normale Supérieure de la rue d'Ulm et le mise en place d'un seul concours d'entrée,
Considérant que l'ancienne Ecole Normale Supérieure de Jeunes Filles a joué un rôle fondamental dans la formation d'un nombre significatif de femmes mathématiciennes en France,
Nous souhaîtons que la plus grande attention soit apportée a cette question, dans le but d'assurer que la continuité de cette tradition ne soit pas perdue.

In conclusion I would like to say that some little progress has been made in the past years in the integration of women into the French mathematical community. They can be very easily destroyed if we do not act to protect them.

Consuelo Flores, Nicagarua: El papel de la mujer en el desarrollo de la ciencia y la matematica en Nicaragua

Nicaragua es un pais situado en el centro del itsmo centro americano, con una extension territorial de 118,358 km$^2$ y approximadamente 3 milliones de habitantes.

La Universidad fue fundada en la ciudad de León en 1812, impartiendose las catedras de teologia y medicina, y es hasta en 1960 que se crea la carrera de físico-matematica, no habiendo participacion femenina.

Es ya en la decada del 70 que las carreras de matematica y fisica se separan poniendose de manifiesto la participacion femenina con una graduacion de 4 mujeres de un total de 9 graduados.

En la siguiente decade se crean en la escuela de matematicas tres departamentos: Matematicas Aplicadas, Matematicas pura y Física; o freciendose las carreras de licenciatura en Estadística, licenciatura en Matematica y licenciature en Física, respectivamente.

Debido al desarrollo científico-tecnico y a la realidad que vive nuestro pais, surge la necesidad de crear la carrera de licenciatura en Computacion, la cual se inició el presente año.

La relacion porcentual estudiantil femenina, en el area científica, es en la acualidad de un 60% en matematica, 70% en estadística, 75% en computacion y 30% en física; siendo la participacion femenina del profesorado en la escuela de matematica de un 30%.

Tambien es notorio el hecho de que la mujer nicagüense goza de los mismos deberes y derechos que el hombre, teniendo igualdad de oportunidades, responsabilidades y salarios.

Finalmente podemos decir que aun con todos los esfuerzos que estamos realizando para el desarrollo de la ciencia y la investigacion en Nicaragua, nos vemos limitados de recursos humanos, bibliograficos y equipos tecnicos, por lo cual solicitamos ayuda en la medida de lo posible.

Para cualquier colaboracion e informacion, favor dirigirse a:

Prof. Consuelo Flores Montalvan
Directora de Matematica Aplicada
Escuela de Matematica - Facultad de Ciencias
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Director de Matematica y Computacion
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Managua, Nicaragua C.A.

Grácias.

## Gudrun Kalmbach, Federal Republic of Germany

In spring I took the initiative to write women scientists in Europe about our panel of AWM and I got 23 answers from the Federal Republic of Germany, Hungary, Norway, Poland, Portugal, Sweden, Switzerland, and the United Kingdom. Some topics on which most of the women had expressed their opinions are:

Most women have no complaints about getting things *published*, but complain about unfair male domination in *discussing* mathematics and at mathematical *conferences* or talks. The *teaching* load is considered fair, but the decisions for the schedule is, as in nearly all university *committees*, done by men only. You, as a woman, have little or no chance to put in your influence. Departmental *help* is distributed to the favor of men. Only one-third of the women run their own seminar and have their own Ph.D. students. *Part-time work* for married scientists is nearly impossible to get. If you have your own children you face being excluded from the ordinary social activities of the department. Most extra university *funds* or governmental money is distributed by male committees - brotherly among brothers *only*. The *decisions* on filling job openings is done behind the scene, also mostly by men only. The social behaviour of colleagues *and* their wives is considered "bad" by half of the professional women, "part-time OK and part-time not OK" by the other half of the professionals.

Here are the themes for today.

A.   The *current status* of women in science is a disaster in Europe. Scientifically talented girls and women are discouraged or pushed out of a career at every age level - from three years on - by every age level of boys, men and - behind the scenes - by housewives with no professional activity.

B.   Since the *last panel 8 years ago* things have not changed. Recently young educated women are the first ones left without a job, and they are forced to accept manual low-paying work.

C.   *Directions to go*:  a) Norway and the University of Hamburg (F.R.G.) have established preference rules for equally talented women concerning new appointments.
b) A subdivision of the European Parliament in Luxemburg tries to change laws, guide lines and programs in favor of professional women.
c) A council of 15-25 women and men in the F.R.G. meet to discuss and promote the participation of girls in high-school science competitions which is below the 2% level. This year we had an increase to about 25% at a "mathematics day" competition and to 10% at a mathematics summer school and a Saturday program for high-school students, all held at universities.
d) We agreed on the occasion of the AWM panel on Aug. 6, 1986 to have regional meetings of the AWM members in Europe.

## Maria José Pacifico, Brazil

Mathematics in Brazil is young, and women participation is even more so. Indeed, significant participation of women in research in mathematics dates from the last 15 years or even less. Roughly speaking, they account for 7 to 20 percent of researchers in the main institutions. No woman is yet a full member of the Brazilian Academy of Sciences, section of Mathematics, in which there are about 15 men. Also the women occupy few of the top positions in the universities.

What could be the causes of such a situation? I believe that there is no direct discrimination in the opportunities for learning, for research training and in hiring, and in fact, in our main institutions the atmosphere is quite good in this respect. Still, most of us continue to be more responsible for the running of our houses than our companions, and only recently have our own families and the society in general stimulated young women to have professional careers in science. That certainly accounts for much of the present status of women in mathematics in Brazil.

Overall, however, the situation is improving. In recent years, for each 10 new Ph.D.'s, about 2 are women. At the master's degree level 30 to 40 percent are women, and we can expect that this will be increasingly better in the future. Also, there is a woman in the National Mathematics Committee

for the Brazilian National Council for Research. This Committee has 6 members, and the mandate lasts for four years.

Much awareness is necessary to keep this trend, and the opportunity to share our experiences with each other from different countries should continue.

## Jennifer Seberry, Australia: to appear

## Caroline Series, England

This spring I circulated a letter to women members of the London Mathematical Society asking for their ideas on the subject of the panel. I sent out about 70 letters, roughly half to institutional addresses. Of the replies I received, the general impression was of little change, with many problems stemming from the primary school level.

Lady Jeffreys, the distinguished applied mathematician and former Mistress of Girton College, Cambridge, who is now 83, writes: "It is 65 years since I began my studies, and it is disappointing that it is still considered rather odd for a woman to be mathematical. Something has to be done in the home (Your mother couldn't do it either, dear) and in the primary school, giving the girls *confidence*, which the little boys have. At all stages confidence is important."

I also believe that confidence is very important, and to this end we can be enormously helped by contacts and support from other women mathematicians. We all know examples where the right word at the right moment has changed the course of a career; certainly in my own case several times very small events have been tremendously important. We need to establish more of an "old girl network" and especially to encourage those starting out on their careers.

On a more personal level, I should like to report that over the last few years I have had the opportunity to work closely with several women and have found that for me this is a very productive and exciting way to do research. One of the things which makes life interesting is the difference in relations between men and men, men and women, and women and women. We should understand that collaborating closely with anyone requires development of a personal as well as mathematical relationship, and in my own case I have found this vastly easier to do with women than with men.

One of the changes which I do see over the last eight years is that there are now enough women involved in serious mathematical research that collaboration between women has become not only possible but quite natural, without compromising standards or field of research. I find this very exciting, and consider myself truly fortunate to be part of what is probably the first generation in history where this has been possible.

## Josephine Guidy-Wandja, Ivory Coast

In my country, French is our official language, so I speak and write so bad English; you must excuse me for that.

When I received the invitation to participate on this panel and address the themes "What is the current status of women in mathematics world-wide? How has the situation for women changed since our last international panel in Helsinki, 8 years ago? What are the directions in which we should be heading?", it was difficult for me to answer, because first, I was not at Helsinki; second, at the last ICM held in 1983 at Warsaw, during the ICMI Session, the last General Secretary of AMU (African Mathematical Union) was invited to talk on mathematics in Africa. He says between all: "... there are five hundred mathematicians men who have the Ph.D. and one woman who has a Ph.D. in pure mathematics... ", and he pointed his finger to me. I was so surprised.

When I return back to my country, I wrote to many African universities to know if there are women teaching mathematics in the university. I received no answer. I didn't know how to interpret this silence.

I went to Joss (Nigeria) in March 1986 to attend the last Congress of AMU. There, I met some women, Dr. Osibodu Bukunola and Prof. Dr. Grace Alele-Williams; they are in math education. I initiated an informal meeting with women who were attending this congress on the subject "Women in Mathematics in Africa."

One of the resolutions of this informal meeting address to AMU was to create some structure to help women in mathematics, structure which received the name "WIMA" (Women in Mathematics in

Africa), and AMU gave its promise to create an AMU Commission on "Women in Mathematics in Africa" which will take the name "WIMA". We hope it will help us.

In the special case of my country there is no difference in the courses or formation received by women or men. But the difficulty is heavier for woman than for man, to arrive at the top Ph.D.

Many African universities don't prepare Ph.D.'s. We need to go to Europe or USA to complete our formation and prepare Ph.D., for about 2 or 3 years. If man can leave at home his wife and children to go to Europe or USA to prepare Ph.D., it is so difficult for woman to leave her children to her husband and go to Europe or USA to prepare her Ph.D.

DEADLINES: Sept. 24 for Nov.-Dec., Nov. 24 for Jan.-Feb., Jan. 24 for Mar.-Apr.
AD DEADLINES: Oct. 5 for Nov.-Dec., Dec. 5 for Jan.-Feb., Feb. 5 for Mar.-Apr.
ADDRESSES: Send all Newsletter material **except ads** to Anne Leggett, Dept. of Math. Sci., Loyola University, 6525 N. Sheridan Rd., Chicago, IL 60626. Send everything else, **including ads**, to AWM, Box 178, Wellesley College, Wellesley, MA 02181.

## JOB ADS

Institutional members of AWM receive two free ads per year. All other ads are $10.00 apiece and must be prepaid. The vacancies listed below appear in alphabetical order by state. All institutions advertising below are Affirmative Action/Equal Opportunity employers.

Arizona State University. Dept of Mathematics, Tempe, AZ 85287. Position of Chair, Dept of Mathematics. Qualifications: demonstrated leadership qualities, strong commitment to academic value & excellence in teaching, research & service. Earned PhD & research credentials commensurate with rank of Professor. Continuing record of professional activity & involvement in the national mathematical sciences community. Commitment to faculty recruitment. 12 mo. appt. effective as early as 1/1/87 & preferably no later than 8/15/87. Salary is competitive & commensurate with qualifications & experience. Send resume & names, addresses & telephone nos. of at least 4 references by 10/15/86 to Dr. Brice Corder, Asst. Dean & Secretary to the Search Committee, Office of the Dean, at the above address.

University of California, Los Angeles. Dept of Math, Los Angeles, CA 90024. Yiannis N. Moschovakis, Chair. Four or five Asst Professorships in pure mathematics. Specific fields of interest: algebra/number theory, analysis, differential equations, geometry/topology, logic, probability & statistics. Required: strong research & teaching background. Will consider outstanding candidates at higher levels and/or in other fields. Apply to Chair.

University of Colorado, Boulder. Dept of Math, Campus Box 426, Boulder, CO 80309. We welcome strong applications at all levels for faculty position Fall, 1987. Prefer those whose research would compliment interests of current faculty. Salary range: $28,000 - $35,000. By 11/30/86 contact New Appointments at above address.

University of Notre Dame. Dept of Math, P O Box 398, Notre Dame, IN 46556. William D Dwyer, Chmn. Several tenured or tenure track positions. All areas of math considered, but prefer candidates in fields of analysis, algebra or algebraic geometry. Also several visiting positions: rank & salary depend on experience & qualifications. Applications should demonstrate accomplishment & potential in teaching & research, & should include vita, summary of research with reprints or preprints, and 3-4 letters of recommendation.

Rutgers University. Dept of Statistics, Hill Center, Busch Campus, New Brunswick, NJ 08903. Dr. Robert Berk, Chmn. Tel. 201-932-2692. Several Asst Professorships & one senior Professorship in Statistics & Biostatistics for Fall, 1987. Candidates for Asst. Prof. should have PhD prior to Dec., 1987. Duties: teaching undergraduate & graduate courses; possibility of statistical consulting; research leading to publications in refereed journals. Senior Professorship requires outstanding research & teaching background. Send vita & 3 letters of recommendation to Chmn.

Cornell University. Biometrics Unit, College of Agriculture & Life Sciences, 337 Warren Hall, Ithaca, NY 14853. Asst Professorship 7/1987. Duties: teaching in academic environment which offers BS, MS & PhD degrees in both Stat & Biometry. Required: PhD in Stat or Biometry. Prefer candidates with biological background & interest in statistical design or biometric applications. By 1/15/87 send resume, transcripts & 3 letters of recommendation to Prof. George Casella at above address.

SUNY - Buffalo. Dept of Math, 106 Diefendorf Hall, Buffalo, NY 14214. Dr. Jonathan Bell, Search Committee Chmn. At least one tenured or tenure track appt 9/1/87. Salary competitive. Will consider applicants in all fields. Required: excellent research accomplishments/potential & strong commitment to teaching. By 12/1/86 send vita & have 4 letters of recommendation sent to Dr. Bell at above address.

Univ of North Carolina, Chapel Hill.Math Dept, Phillips Hall 039A, Chapel Hill, NC 27514. John A Pfaltzgraff, Chmn. (1) Tenure track & visiting faculty positions Fall, 1987. Rank & salary dependent on qualifications & budget considerations. Required: PhD, strong research program & commitment to excellent teaching. By 1/10/87 send 4 letters of recommendation, vitae & abstract of current research program to Chmn. (2) University Distinguished Professor of Mathematics. Required: established record of excellence in research, demonstrated commitment to excellent teaching & ability to provide scientific leadership. Prefer candidates in fields of partial differential equations & their applications & computational & applied math. Send application, vitae & names of at least 4 references to Chmn.

Ohio State University. Dept of Math, 231 W 18th Ave, Columbus, OH 43210. Several positions both visiting & permanent, autumn quarter 1987. Will consider candidates in all areas of applied & pure math. Expect significant research accomplishments or exceptional research promise & evidence of good teaching ability. Send credentials & have letters of recommendation sent to Prof Joseph Ferrar at above address.

Bloomsburg University. Dept of Math & Comp. Sci., Bloomsburg, PA 17815. James C. Pomfret, Chairperson. Tenure track positions for 1987-88 academic year for individuals with PhD in math sciences & able to assist our developing programs in comp sci & stat. Review of applications will begin 1/1/87. Will conduct interviews at Joint Meetings in January. Send vita & 3 letters of recommendation to above address.

University of Tennessee. Dept of Math, 124 Ayres Hall, Knoxville, TN 37996-1300. Professorship or Associate Professorship in geometric topology & numerical analysis. Tenure track Asst Professorship in or related to: algebra, analysis, integral equations, mathematical ecology, numerical analysis, ordinary & partial differential equations, probability, topology, statistics. Visitors - all levels, one or more quarters in areas related to current program. Contact John S Bradley, Dept Head.

Vanderbilt University. Dept of Math, Nashville, TN 37235. Prof R R Goldberg, Chmn. Centennial Professorship. Specialization in computer-related mathematics. Beginning Fall, 1987. This position will become a named endowed Chair. Intended for person of distinction whose primary research involves actual computing. Have vita & letters of recommendation sent to Chmn.

# CALL FOR PARTICIPATION

The AWM is in the process of revising and reconstituting its committee structure in order to better reflect the interests and meet the goals of the membership. If you would be interested in serving on any of the committees, subcommittees or the taskforce described below, please indicate that on the form provided below and return it to Linda Keen by November 15, 1986.

1. The COMMITTEE ON RELATIONSHIPS WITH OTHER SOCIETIES (CROS) is charged with overseeing the activities of other societies (such as, AMS, MAA, SIAM, CBMS, AWIS, WME) and making members of their governing bodies aware of the feelings, goals or official positions of AWM when appropriate. In addition, there will be two subcommittees. The JOURNAL AND SPEAKER SUBCOMMITTEE will monitor the representation of women on editorial boards for journals or as invited speakers at the meetings of societies. The president of AWM will be alerted to cases of poor representation so that action such as letter writing or phone contact can be pursued. The MATH-EDUCATION SUBCOMMITTEE will prepare newsletter articles for the AWM and WME newsletters and will respond to requests to AWM for feedback or information on Math-Ed related issues.

2. The EMMY NOETHER LECTURE COMMITTEE selects and invites an eminent woman mathematician to give the Emmy Noether Lecture at the annual AMS/MAA Meeting in January.

3. The FUNDRAISING COMMITTEE is charged with seeking funds to support the efforts of the Speakers' Bureau and with supplying information and materials to help others do fundraising for special events such as conferences for the exchange of research information or for encouraging women to take more mathematics in their programs of study.

4. The SPEAKERS' BUREAU is to maintain an updated list of speakers and publicize their availability for speaking at elementary, secondary and/or college levels. The scope of the Speakers' Bureau is directly related to the amount of funding available for advertizing it.

5. The TASKFORCE TO STUDY MATERNITY LEAVE POLICIES will solicit information concerning various maternity leave policies and prepare a report describing such policies and clarifying practices that may be illegal. The report will be in the form of an article for our newsletter.

---------------Please complete the following---------------

I am interested in serving on the
- ☐ The Committee on Relationships with Other Societies
- ☐ The Journal and Speaker Subcommittee
- ☐ The Math-Education Subcommittee
- ☐ The Emmy Noether Lecture Committee
- ☐ The Fundraising Committee
- ☐ The Speakers' Bureau Committee
- ☐ The Taskforce to Study Maternity Leave Policies.

I am not able to serve at this time but would be able to serve on

_____after_____.

Please, mail the completed form to L. Keen, President of AWM; Herbert H. Lehman College (CUNY); Bronx, NY 10468.

**Association for Women in Mathematics**
Box 178, Wellesley College, Wellesley, MA 02181
617-235-0320  Ext 2643

Application Blank

The AWM membership year is Oct 1 to Oct 1

    Individual $15 _____
    Family $20 _____
    Contributing Member $20 or more in addition to regular dues _____
    Retired, Student, Unemployed $5 _____
    New Member Rate:(Individual) (Applicable only to those who are joining
       AWM for the first time.) For each of 1st 2 years $10_____
    Foreign members please remit $8.00 additional for postage.
    Institutional (2 free advertisements per year in Newsletter)
       Sponsoring, Category I $65 _____
        (Includes nomination of 10 students for free membership for 1 year)
       Sponsoring, Category II $45 _____
        (Includes nomination of 5 students for free membership for 1 year)
       Regular $25 _____

**Name** _____

**Address** _____

**Institutional Affiliation, if any** _____

Association for Women in Mathematics
Box 178, Wellesley College
Wellesley, MA 02181

Sept. - Oct., 1986

Marie A. Vitulli
Univ of Oregon
Dept of Math
Eugene          OR 97403