Association for Women in Mathematics

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DUES! DUES! DUES! DUES! DUES! DUES! DUES! DUES! DUES! DUES! DUES! DUES!
Dues are due October 1. Please send them in along with your reminder postcard. Encourage your institution to become an institutional member (see the president's report for more information). Consider becoming a contributing member yourself.

MORE ADDRESS CHANGES! AWM's address is now AWM, P.O. Box 178, Wellesley College, Wellesley, MA 02181. You may have noticed last issue that our president's address has also changed. See the end of the president's report for the new one.

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PRESIDENT'S REPORT

Change in institutional memberships. This year AWM is offering institutions the opportunity to sponsor memberships for students through a new category of membership called "Sponsoring Institutional Membership". For an extra $20 per year, an institution may name up to five (or for $40, up to ten) students to become members of AWM and to receive this Newsletter. Current institutional members should have already received information about our new program, and prospective institutional members will hear from us soon. The purpose of the program is to introduce interested students to AWM through their departments.

Boston Area grant. This summer AWM has been sponsoring a program which pays tuition for eligible women high school mathematics teachers who want to take courses in the computer language Pascal. The program has been made possible by a grant of $5000 from Raytheon. Eleanor Palais is chair of the AWM Fundraising Committee. [More info from the press release: The program will prepare teachers for the introduction of the Advanced Placement (AP) Pascal program which will be offered in many high schools starting in September. This summer tuition awards were made to 23 teachers in the Greater Boston Area.]

Another MacArthur fellowship. Congratulations to Karen Uhlenbeck of the University of Chicago and the University of Illinois, Chicago, for winning a prestigious MacArthur Fellowship, which provides a five-year grant totalling $204,000. The program was initiated to support "geniuses". Dr. Uhlenbeck is the second woman mathematician to receive the award; the first was Julia Robinson.

The perils of publishing. In my last report I mentioned the difficulties that new mathematicians face when they try to understand the process of submitting papers for publication. There was considerable positive response to the suggestion that AWM try to help people understand this process. It is possible that we might have a panel or

workshop on this, but in the meantime it would be wonderful if someone, especially a person who has been an editor, would write an article on this subject for the Newsletter.

Please continue to send me your opinions and comments.

Linda Rothschild
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AMS ELECTION STATEMENTS

As usual, requests for statements from candidates for contested offices in the upcoming American Mathematical Society election have been sent out. (Thanks to Associate Editor Jeanne LaDuke for taking care of this.) Also as usual: candidates by petition are not known in time, and summer schedules make it difficult for some candidates to respond. One change this year: the office of Trustee has become a contested one. This suggestion was made in a statement to AWM a year or two ago.

The statements below appear in alphabetical order by candidate.

David Eisenbud

It is clear that women have often been steered, both subtly and blatantly, away from mathematical study at many levels. From the early learning experiences of my own daughter I am convinced that we have a very long way to go before this wasteful and damaging prejudice is overcome.

The central task of the American Mathematical Society is, in my view, to encourage mathematical research, and promote a healthy and stimulating environment for that research. This must include as a priority the measures necessary to encourage the full participation of women and minorities in the field.

Ted Gamelin

I fully support efforts to increase the representation of women among the ranks of professional mathematicians. I believe that this can be done without compromising quality or setting different standards with respect to faculty hiring and granting of tenure. I adhered to this philosophy during my two-year term (1978-1980) as Chair of the Mathematics Department at UCLA, during which period the Department augmented its number of tenured woman mathematicians (from zero to two).

H. Halberstam

I see three current issues as having special significance to the membership of the AMS: 1) the provision of adequate national support for research in mathematics and an equitable allocation policy are matters on which the AMS should give strong leadership, having in mind the high quality of research current in many universities across the nation; 2) the AMS should promote the growth and strengthening of mathematics major programs - industry and commerce as well as graduate schools need highly qualified mathematicians; 3) the AMS should involve itself in some measure in the movement towards revival of mathematics teaching in the country's schools.

Steve Smale

To members of AWM: I hope that the things I would do as Vice-President of the AMS will be supportive of your concerns.

Jacob T. Schwartz

My candidacy for AMS vice-president should be regarded as an attempt to strengthen relationships between pure mathematics and Computer Science, which has been my principal interest for more than a decade now. Recently these computer science interests have moved strongly in the direction of robotics, which has a particularly high mathematical content, involving such areas as computational algebraic geometry and topology, control theory and theory of differential equations, numerical analysis, and dynamics. These are areas in which mathematicians could make real contributions, and through which employment opportunities for mathematicians could be significantly broadened.

As to questions of special interest to women in mathematics: here I am a bit at a loss as to what to say, since I regard mathematics as a quintessentially "unisex" profession. I am honored to have become a friend of several of today's most distinguished women mathematicians, and would resent any impediment which placed difficulties in the way of women who aspire to mathematical careers.

Harold Stark

As a candidate for the Nominating Committee, I'm not sure that it's appropriate to give my opinions on a wide range of issues affecting mathematics. I do believe that much of the Society's work is being done by a small subset of the members and that this is not an entirely good thing. The membership of the Nominating Committee should be as broad as possible. (I note in passing that there are a disproportionate number of candidates for the Committee in areas related to Number Theory. Whoever nominates the candidates for the Nominating Committee did not do their job.) Even still, the Committee can not just stick to its own acquaintances if it truly wants to involve more of the membership in the Society's business. It seems to me that the members of the Committee should consult as wide a range of people as time allows before preparing nominations.

Jean E. Taylor

The statement I sent to the AMS is:
Two of my long-time concerns are:
1) Mathematics should not be too inward-looking. It needs, for its own welfare, the stimulation of new problems from outside itself. Recent trends back in this direction are very encouraging.
2) "Mathematics is a young man's field." I feel that this statement, which recently appeared in newspapers again, somewhat distorts the mathematical enterprise and has a particularly unfortunate impact on young women. We must pay attention in general to the public's perception of mathematics--and also to our own commitment to the furtherance of women (and minorities) in mathematics.

These concerns are quite personally and strongly felt--two of the reasons that I am reasonably happy at Rutgers are that there are a lot of other women mathematicians on the faculty, and that the pure versus applied mathematics line is not drawn very sharply.

With regard to the second point in my statement, I am also concerned that I see a lot of "you can't have it all" statements in the press, with reference to families and careers and directed at women. To me, the message that is conveyed to young women is that they should narrow their aspirations--which I think is all wrong. I'm not sure what the Council of the AMS can or should do about such matters, but I'd try to keep my eyes open.

I favor a relatively activist role for the AMS, whether in going after more Federal support for mathematics, in public relations, or in taking stands on human rights violations involving individual mathematicians or the closing of the West Bank universities.

BOWDOIN AWM MEETING

by Stephanie Troyer, AWM Councilmember, University of Hartford

On June 18th at Bowdoin College, AWM held a meeting chaired by Elizabeth Grobe and organized by Stephanie Troyer in conjunction with the Regional Spring Meeting of the MAA. Florence D. Jacobson, professor emerita at Albertus Magnus and founding member of AWM, gave an invited address called "What are we doing for the next generation?". She discussed three projects with which she is currently involved. The first is the Woman and Mathematics high school lecture program of the MAA, for which she is Connecticut's co-director; she reports that the program is well-organized and well-received, but currently under-used, as is the MAA lecture program for colleges (members might encourage their own colleges and secondary schools to request lecturers). Next discussed were the "Multiply Your Options" conferences for high school girls, teachers and parents being sponsored by the Project to Increase Mastery of Mathematics, a Connecticut academic and industry group devoted to improvement of mathematics education. The third project was the design of a Mathematics and Literature course option for Albertus Magnus's required sequence, Women and Creativity. Information is available from MAA on the WAM program, Robert Rosenbaum (Wesleyan) on PIMM, and Dr. Jacobson (Albertus Magnus) on the Women and Creativity curriculum.

Attendance was super. (In fact the vendors complained that everyone went to the talk after lunch, instead of looking at the software...). And there's a new generation (male and female, with males completely sympathetic) to tell about AWM. I'd like to encourage members who'd like to arrange meetings in conjunction with regional math events to clear it with Margaret Munroe (who could supply application blanks and sample Newsletters--mine were all taken at Bowdoin!) and go ahead. I'd be glad to help anyone who wanted ideas or advice. [Ed. note: Bettye Anne Case is also willing to supply such aid.]

HONORS, ETC.

Thanks to Rhonda Hughes, Lisa Mantini, and Alice Schafer for bringing some of this material to our attention.

Bunting Science Fellows. Congratulations to three women mathematicians who have been awarded Science Scholar Fellowships at the Bunting Institute. They, their institutions and their topics are:

Gudrun Birgitta Brattstrom, Université de Paris-Sud,
"p-adic Heights on Elliptic Curves";
Pamela Coxson, University of Delaware,
"Reduced-Order Models of Large-Scale Systems by Aggregation"; and
Naomi Jochnowitz, University of Rochester,
"Modular Forms and the Study of the Hecke Algebra".

The Mary Ingraham Bunting Institute of Radcliffe College announces the Bunting Fellowship Program for 1984-1985. The Bunting Fellowship Program supports women who wish to pursue independent study in academic or professional fields, in creative writing, or in the arts. The purpose of the fellowship is to provide the opportunity and support for a professional woman to complete a substantial project in her field and thereby advance her career. Appointments are full time for the year July 1 through June 30 and require residence in the Boston area during the term of appointment. Fellows are expected to present their work-in-progress in public colloquia during their appointment. The fellowship stipend for the year 1984-1985 is $15,250. Office or studio space, auditing privileges, and access to libraries and other resources of Radcliffe College and Harvard University are also provided.

Fellows may be at various levels of career development ranging from early post-doctoral to senior professional ranks. Applicants should have received their doctorates at least two years prior to the date of fellowship appointment. Academic applicants without doctorates but with equivalent professional experience will be considered. Applicants in creative writing, the visual arts, or music are expected to be at an equivalent stage in their careers. The application deadline for the year 1984-1985 is October 7, 1983. Inquiries and requests for applications should be made to: Bunting Fellowship Program, The Mary Ingraham Bunting Institute of Radcliffe College, 10 Garden Street, Cambridge, MA 02138. Telephone: (617) 495-8212.

AAUP Achievement Award. This year's recipient of the American Association of University Women Educational Foundation's achievement award is Captain Grace Murray Hopper, the inventor of the computer language COBOL (Common Business-Oriented Language). Hopper's career spans more than half a century and includes teaching mathematics at her alma mater, Vassar, and at Harvard, and working as a scientist at Sperry Rand. She is also the oldest officer on active duty in the U.S. Navy. [Ms., August 1983, p. 18.]

Warner-Lambert Visiting Scientist. Dr. Thelma Estrin, Professor of Engineering, Dept. of Computer Science, UCLA, was a departmental lecturer for the winter term in the Warner-Lambert Visiting Scientist Series sponsored by the Center for Continuing Education of Women. Congratulations!

Correction. Last issue, I gave Deane Yang an involuntary sex-change operation. Although nonetheless worthy of congratulations, Yang is male. So unless I made further errors in my first-name analysis, only one of the thirty-one awardees of the NSF Mathematical Sciences Postdoctoral Research Fellowships was a woman.

AMS Research Fellowships. The terms of the AMS Postdoctoral Research Fellowship are being changed. It has been the case that fellowships were open to individuals who had recently received the Ph.D. degree. This was ordinarily interpreted by the judging panel as meaning no more than four years past the Ph.D. degree. The new version of the fellowship will be open to persons in early mid-career. This will ordinarily be interpreted as meaning four to ten years past the Ph.D. (or equivalent), regardless of age, but below the academic rank of professor. Moreover, the vita must include some post-doctoral work experience, i.e., non-fellowship years.

The stipend has been set by the Trustees of the Society at $30,000 for eleven months of full-time research or its equivalent. In addition, there will be an expense allowance of $1,000. Applicants must be citizens or permanent residents of a country in North America. Fellowships may be held at any institution the Fellow selects or at more than one in succession. There is flexibility in the choice of time interval(s) and manner in which the Fellow may draw funds. For instance, given the opportunity, a Fellow may elect to hold a half-time academic appointment with a teaching responsibility not exceeding one course per term while holding the fellowship at one-half stipend over a two-year period. The fellow should consult the Secretary of the Society to learn whether the proposed arrangement is acceptable to the Society.

The number of fellowships depends on the amount of money contributed to the program. The Trustees have arranged the matching program from general funds in such a fashion that funds for at least one fellowship are guaranteed.

The deadline for receipt of applications is December 1, 1983. Awards will be announced late in January 1984.

For further information and application forms, write to William J. LeVeque, Executive Director, American Mathematical Society, P.O. Box 6248, Providence, RI 02940.

Fulbright Awards Available for 1984-1985. The Council for International Exchange of Scholars (CIES) has recently published a booklet, 1984-1985 Fulbright Senior Scholars: Awards Abroad. This booklet lists awards available for university lecturing and advanced research in mathematics and in the physical sciences in countries throughout

the world. In recent years from ten to fifteen awards have been made to specialists in mathematics and statistics.

To obtain a copy of the 1984-1985 announcement, write to CIES, Eleven Dupont Circle, N.W., Suite 300, Washington, DC 20036.

National Science Foundation. The National Science Foundation announces the sixth year of its Mathematical Sciences Postdoctoral Research Fellowship Program. The Foundation plans to select in February 1984 approximately 30 applicants for fellowships for post-doctoral research in the mathematical sciences. The Fellowships are designed to permit recipients to choose research environments that will have maximal impact on their future scientific development. Awards of these fellowships will be made for appropriate research in pure mathematics, applied mathematics, and statistics. Fellowships will be offered only to persons who (1) are citizens or nationals of the United States as of January 1, 1984, (2) will have earned by the beginning of their fellowship tenure a doctoral degree in one of the mathematical sciences listed above or have had research training and experience equivalent to that represented by a Ph.D. degree in one of those fields, (3) will have held the doctorate for no more than five years as of January 1, 1984, and (4) will not previously have held any other NSF Postdoctoral Fellowship.

The Foundation welcomes proposals on behalf of all qualified scientists and engineers, and strongly encourages women and minorities to compete fully in all of the research and research programs it supports. For application forms and additional information contact: Mathematical Sciences Postdoctoral Research Fellowships, Mathematical Sciences Section, National Science Foundation, Washington, DC 20550.

Honors Workshops for Pre-college Teachers of Science and Mathematics: The economy and technological leadership of the United States depend increasingly on qualified men and women trained in science and mathematics.

For a steady supply of such personnel, the nation looks to its elementary and secondary school systems, where the quality of the pre-college teachers, teaching materials and educational techniques help determine whether students are motivated and how well students learn.

Excellent teachers are at the core of good education at any level. But in pre-college mathematics and science, they are in short supply. There is an urgent need to attract highly talented men and women to mathematics and science teacher careers, develop teacher's capabilities in these critical areas, and keep good teachers employed in the school systems. This requires devising incentives for mathematics and science teachers such as greater public recognition of their profession, and new emphasis on the important contribution teachers are making to the nation.

The basic goal of this program is to motivate and increase the capabilities of precollege mathematics and science teachers and thereby improve their instruction of students. Projects will be considered for teachers of all precollege levels, from kindergarten through grade twelve.

Write: Honors Workshops for Precollege Teachers of Science and Mathematics, Office of Scientific and Engineering Personnel and Education, NSF, Wash., DC 20550.

The Materials Development for Precollege Science and Mathematics program addresses the need to develop teacher capabilities in the critical areas of mathematics and science and improve their instruction of students. Projects will be considered for teachers and instruction at all precollege levels, from kindergarten through the twelfth grade. Write: Materials Development for Precollege Science and Mathematics, Office of Scientific and Engineering Personnel and Education, NSF, Wash., DC 20550.

Prospective applicants for research grants may find the booklet Grants for Scientific and Engineering Research helpful. Write to Forms and Publications, NSF, Washington, DC 20550 and ask for NSF 81-79. See also pages 488-489 of the AMS Notices, August 1983, for some guidelines for proposal preparation.

WOMEN IN THE AMERICAN MATHEMATICAL SOCIETY BEFORE 1900: part two of three

by Professor Betsey S. Whitman, Florida A&M University

Four women joined the Society in 1894, the year that the name was changed to the American Mathematical Society. Charlotte Cynthia Barnum was one of the first five American women to earn a Ph.D. in mathematics and the first to earn one at Yale University. She was awarded the degree in 1895 after studying there from 1892 until 1895. Her dissertation was titled "Functions Having Lines or Surfaces of Discontinuity." She had graduated from Vassar in 1881 and taught at Betts Academy, Hillhouse High School, and Smith College before studying at Johns Hopkins University from 1890 until 1892. After she received her Ph.D., she taught college mathematics for only one year, at Carleton College in 1895-96. From 1898 until 1900, she was engaged in actuarial work with the Massachusetts Mutual Life Insurance Company and the Fidelity Life Insurance Company. In 1901 she went to the U.S. Naval Observatory and was in the tidal division of the U.S. Coast and Geodetic Survey until 1908. She worked as an editorial assistant for Webster's from 1886 until 1890 and for the U.S. Department of Agriculture from 1908 until 1913 in a biological survey. She did editorial work for the Yale Peruvian Expedition from 1914 until 1916, and for the Yale University Press in 1915 and again in 1918-19. From 1919 until 1921 she did editing, indexing, and proof reading in New York City. Then she went back to teaching mathematics from 1921 until 1923 in Scoville and Columbia Preparatory schools in New York City and at Walnut Hill School, Natick, Massachusetts. She died on March 27, 1934, in Middletown, Connecticut, two months shy of her 74th birthday.

Ruth Gentry also joined the Society in 1894, the same year she finished her Ph.D. at Bryn Mawr in mathematics. She remained a member until her death in 1917. She was born February 22, 1862, and received her early education at the public schools of Stilesville, Indiana, and then earned an A.B. degree at Indiana State Normal (now Indiana State University) in Terre Haute, in 1880. During the next ten years, she taught at preparatory schools and then earned a Ph.B. degree at the University of Michigan in 1890. She was a Fellow in Mathematics at Bryn Mawr during 1890-91, and then she received the European Fellowship of the Association of College Alumnae and studied at the University of Berlin during 1891-92. She wrote of that experience, "I assume, on general principles, that there are students who look with disfavor upon anything pointing in the direction of co-education in Germany; what percent of the Berlin students belong to this class I have not the data for computing, but the number of those who have annoyed me I can reckon to a nicety--the number is zero." She seemed to enjoy her year at Berlin, and then she spent a semester at the Sorbonne in Paris attending the lectures of Professors Picard, Darboux, and Raffy before returning to Bryn Mawr. After completing her Ph.D. under Charlotte Scott and Professor James Harkness at Bryn Mawr, she taught at Vassar from 1894 to 1902. She was the first faculty member in the mathematics department who held a Ph.D. degree. From 1902 until 1905 she was the associate principal and head of the mathematics department at a private school in Pittsburgh, and she was a volunteer nurse during 1910-11. She was offered a part-time teaching position at Bryn Mawr in February, 1910, but she did not respond soon enough and it was given to another mathematics graduate from Bryn Mawr. From 1911 until 1914, she traveled in the United States and Europe. A friend wrote about her later that she was increasingly ill from the time she left Vassar until her death in 1917. At the time of her death she had only one survivor, a nephew in Indianapolis, Indiana.

Frances Hardcastle joined the AMS in 1894, too. She was born in England in 1866 and educated there until 1892, having taken the Math Tripos Part I in 1891 and Part II in 1892 while she was a student at Girton College in Cambridge. In 1892 she came to the United States to study at Bryn Mawr. She attended lectures there with Charlotte Scott in analytical geometry during her first semester. Professor Scott wrote in the Record Book of Graduate Students, now housed in the Bryn Mawr Archives, that "she has spent much time on a translation of a pamphlet by Felix Klein, a work for which she has received his permission, cordially expressed. Miss Hardcastle is exceptionally qualified for advanced work in mathematics. She has a superior breadth of view and has

done much general reading." The translation was published in 1893 with the title "On Riemann's Theory of Algebraic Functions and Their Integrals: A Supplement to the Usual Treatises. In 1897, the French publication by A. Rebière, "Les Femmes dans la Science," mentioned the translation and then incorrectly assumed, "Cette demoiselle est probablement américaine." Frances stayed in the United States until 1901, spending most of her time studying mathematics. She was an Honorary Fellow in Mathematics at the University of Chicago in 1893-94 and then received a fellowship at Bryn Mawr for 1894-95. During that year she studied advanced analytical geometry, which was a continuation of her work at Chicago the previous year. She was particularly interested in the theory of point-groups on curves, and Miss Scott wrote: "The field to be covered is so wide that no very speedy results can be looked for. ... The strength of her work lies in her breadth of view, which should be of great service to her in the investigation she has undertaken." The Bryn Mawr literary publication, The Lantern, in June, 1895, reported that "a conference of graduate students from 20 colleges and universities was held in New York in April, 1895," and Frances Hardcastle was one of two delegates from Bryn Mawr. She was then the president of the Graduate Club. She never earned a degree at an American school before she returned to England in 1901. She died there on December 26, 1941.

Fanny Rysam Hitchcock joined the AMS in 1894 and remained a member until 1910. She received her Ph.D. in chemistry from the University of Pennsylvania in the same year, and her dissertation was titled "Tungstates and Molybdates of the Rare Earths." She was director of the graduate department for women at the University of Pennsylvania from 1897 until 1902 when she became director of Women's Studies. She was elected a member of Sigma Xi in 1910. When she died in 1936 at her home in Warwick, New York, she left part of her estate to the University of Pennsylvania Trustees to "provide for the professional, technical, and vocational training of women, either in the regular departments of the University now open to women, or in a separate department as the Trustees may deem best,...provided that such departments shall, in all cases, be open to men on the same terms as to women."

The only woman elected to membership in the Society in 1895 was Sarah Antoinette Acer who received her A.B. from Vassar in 1884. It is thought that she changed her first name to Sarah in 1894, as she was Kittie Antoinette Acer before then. She taught mathematics at Wells College from 1886 until 1896 when she resigned to marry Dr. Edward Fulton, Professor of English at Wells. They remained at Wells until 1900 when they traveled to London where Sarah did settlement work. In 1901 her husband accepted a position at the University of Illinois as Professor of English Literature, and they were still there when Sarah died in 1913.

In 1896, Estella Kate Wentz joined the AMS. She was born in Indianapolis, Indiana, April 8, 1866, and received a B.S. degree from Purdue in 1887 and an M.S. in 1890. She was a mathematics instructor at Purdue from 1888 until 1892 when she entered the graduate school at Cornell to earn a masters degree in mathematics, which she completed in 1894. She taught at Emmerich Manual Training High School in Indianapolis from the time it opened in 1895 until her retirement in 1931. When the mathematics department was formed in 1904, she was made the head and held that position until her retirement. Her obituary in the Indianapolis Sunday Star, August 7, 1938, said that she was "known widely as an outstanding mathematics teacher", and the principal of Manual High School indicated she had "unusual ability to inspire boys."

Five women were elected to membership in the Society in 1897. One was Annie Louise MacKinnon who had earned her Ph.D. in mathematics at Cornell in 1894. Her dissertation was titled "Concomitant Binary Forms in Terms of the Roots." In that same year she was awarded the Association of Collegiate Alumnae European Fellowship to study mathematics at Göttingen University, where she stayed until 1896. While she was abroad she was elected an alumnae member of the Phi Beta Kappa chapter at the University of Kansas where she had earned both her B.S. and M.S. degrees. When she returned to the U.S., she became Professor of Mathematics at Wells College, succeeding Sarah Acer. She served as registrar as well until 1901 when she married Edward Fitch, Professor of Greek at Hamilton College. The Fitchs lived in Clinton, New York, and Annie was active in many organizations. She devoted much time and energy to the task of encouraging

women to take a public interest, not only in their local community, but also in the affairs of the state and nation. A few months before she died at the age of 72 in 1940, she wrote to a friend, "It seems to me worthwhile that some women are intelligent about things mathematical even if their own accomplishments are not great."

Ada Isabel Maddison, another woman elected to the AMS in 1897, knew Annie Louise MacKinnon in Germany at Göttingen. She was born in Cumberland, England, and studied at the University College of South Wales for four years and at Girton College, Cambridge, for three years. In 1892, she passed both the Cambridge Mathematical Tripos, first class, equal to the 27th Wrangler, and the exams of the Mathematical Honour School at Oxford University. She then entered Bryn Mawr as a graduate student and studied with Charlotte Scott. Dr. Scott wrote in the graduate students' record book, "she has been pursuing an investigation relating to the singular solutions of differential equations. Miss Maddison has a powerful mind and excellent training." In 1894 she was the first student to win the Mary E. Garrett Fellowship from Bryn Mawr for study abroad and she chose to study at Gottingen. Then she returned to Bryn Mawr and completed her Ph.D. in 1896 with her dissertation "On Singular Solutions of Differential Equations of the First Order in Two Variables, and the Geometrical Properties of Certain Invariants and Covariants of Their Complete Primitives." She taught mathematics at Bryn Mawr until 1904 when she was made assistant to President M. Carey Thomas. She continued as assistant to the president in addition to her position as Recording Dean from 1910 until she retired in 1926. In 1937, she wrote in a letter, "I confess to feeling ashamed of having deserted mathematics for a less rarified atmosphere of work among people and things, but I still have my old allegiance to the most perfect of sciences." She died at her home in Wayne, Pennsylvania, at the age of 81 in 1950.

Anna Helene Palmie earned a Ph.B. from Cornell in 1890 and was a graduate fellow in mathematics there until 1892 when she accepted a position at the newly founded Women's College of Western Reserve University in Cleveland, Ohio. She became professor of mathematics in 1895 and joined the AMS in 1897. At the time of her retirement in June, 1928, she said, "Teaching mathematics is a wonderful way to know and study youth. In the early days, every girl studied it. I did all the teaching of it. So I knew every girl. Living in the dormitory, with my youthful appearance--though I was really much older than any of them--made me fully one with them. I think the thing that makes it less hard for me to resign is that the growth of classes has lessened this intimate relation." She was made Professor Emeritus of Mathematics and retired to Florida where she died in 1946 at the age of 83.

LES FEMMES DANS LA SCIENCE BY A. REBIÈRE: part three of four

translated and edited by Lori Kenschaft, Swarthmore College

The fluidity of blood and the agility of the animal spirits render women incapable of paying serious attention to all which is a little abstract, and the distaste which they feel for all reasoning which follows proves the delicacy of their imagination, which has not the strength to sustain this effort.

--Du bel ésprit; 1695; Paris

Reason wills that the women do not learn to read the stars; that they count the eggs of the farmyard, not the stars of the firmament.

Reason wills that botany be prohibited for women by principle; that they limit themselves to familiarity with the kitchen garden and simple plants.

Reason does not approve of women who attend lectures on chemistry: the cooks who do not know how to read are those who make the best soup.

--Sylvian Marechal

Klumpke (Dorothée)

Your thesis in mathematics is the first that a woman has defended before our Faculty.
--Darboux

This astronomer was born in San Francisco, which she left when young, along with her sisters, who were also quite gifted, one of whom became Mme. Degerine-Klumpke and did important work in physiology.

Mlle. Dorothée spent part of her youth at Göttingen and at Lausanne, and later came to Paris. At first, she studied languages, which much later allowed her to follow the scientific movement everywhere. After having taken the examinations of the Hotel de Ville for her bachelor of science and licentiate degrees, she was admitted as a free student to the Observatory.

When, in April 1887, the first congress of astro-photographers assembled to make a chart of the sky, Mlle. Klumpke translated the foreign papers.

She next devoted herself to numerous observations of the asteroids and of the new comets at the equator in the east, which is not an easy activity. Her results were presented to the Academy of Sciences by Admiral Mouchez and consigned to reports (the Millosewich, Charlois, Borelli, Wolf Asteroids, etc.; the Temple-Swift comet, etc.).

On December 23, 1893, Mlle. Klumpke defended at the Sorbonne her thesis for the Doctorate of Mathematical Sciences, before M.M. Darboux, Tisserand, and Andoyer. The topic was Contribution a l'étude des anneaux de Saturne (A contribution to the study of Saturn's rings). It was pure theory. Indeed, science actually admits that the rings are made from solid particles which are widely spaced and active one upon the others through their reciprocal attractions, which are very weak in comparison to those of the planet. The case considered in the thesis, purely hypothetical, does not conform to this fact; it had already been treated by Laplace, then by Mlle. Kowalevski, and its solution came to be completed. Mlle. Klumpke found the equilibrium positions of the rings, totally neglecting Saturn's mass, and she gave the unknown with an approximation of the third order.

The Doctor was accepted by the jury by a unanimity of white balls.* The president concluded thus:

"The great names of Galileo, of Huygens, of Cassini, of Laplace, not to speak of those of my illustrious colleagues and friends, are attached to the history of each serious progress in this theory of the rings of Saturn, which is as attractive as it is difficult. Your work, too, supplies a contribution which is not to be disregarded, and which places you in an honorable rank beside the women who have consecrated themselves to the study of mathematics. In the last century, Mlle. Marie Agnesi has given us a Treatise on differential and integral calculus. Since then, Sophie Germaine, as remarkable for her literary and philosophical talent as for her mathematical skill, earned herself the esteem of the great geometers who honored our country at the beginning of this century. Just a few years ago, the Academy of Sciences awarded one of its greatest prizes which placed the name of Mlle. Kowalevski beside those of Euler and Lagrange in the history of discoveries relative to the theory of movement of a solid body around a fixed point..." And M. Darboux added, "And you, Mademoiselle, your thesis is the first which a woman has presented and defended with success before our Faculty to obtain the degree of Doctor of Mathematical Sciences. You deservedly open the way, and the Faculty is eager to declare you worthy to obtain the degree of Doctor with all white balls."

Mlle. Klumpke is now at the head of the Department of standards of negatives for the photographical catalog of the stars. The Department works to link the numerous individual plates. The work is performed in an isolated pavilion, where, with the aid of two machines, the details of the chart are created by Mmes. Schott, Marquette, Coniel, Dauphin, and Lampdon.

*Translator's note: It was the practice for elections to be conducted by passing around a small box into which each person placed either a white ball, meaning an affirmative vote, or a black ball, meaning a negative vote.

DOROTHEE. KLUMPKE

Last winter, Mlle. Klumpke gave, following de Toqueville's path, several lectures entitled Notions sur les mondes célèstes et les systèmes d'étoiles (Ideas on the celestial world and the systems of the stars). (1. Generalities and the sky of the ancients. 2. The sun. 3. The stars. 4. The modern sky.)

Mlle. Klumpke, who is a liberal protestant, gives indication for the use of astronomical instruments to protestant missions.

When we had the honor to see the young astronomer of the Observatory of Paris, she was leaving to observe the solar eclipse of August 9, 1896, in Norway.

Works by Mlle. D. Klumpke:
Les Catalogues stellaires. (Bulletin of the Astronomical Society of France)
engravings
Recherches sur les spectres et des météorites, d'après N Lockyer.
In F. Tisserand's astronomical Bulletin:
Sur l'étude de Kreutz, Untersuchungen ueber das Cometesystem. 1889.
Spectres stellaires. 1890.

Sur l'Observatoire de Pékin, d'après Russel. 1891.
Tycho-Brahé. 1891.
Eléments définitifs de la Comète. 1885, III.
In the Bulletin of the Astronomical Society of France:
Arcs crépusculaires de la planète Mars.
Contribution a l'étude des anneaux de Saturne. Paris, 1894. 70 pp.
The Observatory, London; December 1896. Obituary on Felix Tisserand.

A PROPOSAL: BROADEN PRESENT CONCEPTS OF MATHEMATICS BY LISTENING TO THE MATHEMATICS QUESTIONS POSED BY WOMEN

This is the text of a proposal submitted to the Mina Shaughnessy Scholars Program by Dr. Frances Rosamond. (The proposal has passed a first screening.) Dr. Rosamond would be interested in hearing what AWM members think about a possible woman's view of mathematics and from anyone interested in joining her in research in this area. Write her at: Dept. of Mathematics, Rochester Institute of Technology, One Lomb Memorial Drive, P.O. Box 9887, Rochester, NY 14623.

Background of the proposal

By her expansion of the concept of the moral domain to include an ethic of care and connection, Carol Gilligan offers us a paradigm to examine the ways women make meaning in mathematics. Gilligan describes an interview in which a young girl's persistently negative response to the Kohlberg dilemma, "Should Heintz steal the drug to save his dying wife?", is negatively interpreted with a low score on Kohlberg's scale. Kohlberg's scale gives high points to responses based on abstract notions of law and justice. Gilligan insightfully reveals that the girl is not responding in Kohlberg's framework at all but instead she has generated a different question out of a different construct of the dilemma situation. She thinks in terms of relationships, context and caring. Her response is not some conscious or unconscious attempt to evade Kohlberg's question. Rather, it reflects her assumption of an every-day reality of connection that appears in contrast to more masculine abstraction notions of law and structure.

A parallel exists between the above interview and analysis and what often happens in mathematics problem-solving. A girl's reluctance to apply rotely some algorithmic approach is interpreted negatively as a failure to think abstractly or to take risks. An implicit accusation is that the girl is evading doing the problem (and thereby saving face because consciously or unconsciously she knows she is not capable of solving it). I firmly believe that the more revealing interpretation is similar to that above: the girl has generated and posed a different question out of a different construct of the problem situation. She tries to 'experience' the problem, relate it to her personal life, and clarify the language before she tries to focus on the question being asked. This is in contrast to the more masculine attitude of "getting on with it" (solving the problem) in a structured, algorithmic manner.

My own research and some of the literature indicate that there is a discrepancy between what males and females see in a mathematics problem. This fall I told two classes of first semester calculus students at Rochester Institute of Technology the following story about a monk climbing a mountain (Mean Value Theorem). I asked them to think about the problem and said we would discuss it the next week. The monk story:

> There was a monk who lived at the foot of a mountain. In the morning he began a walk up the mountain at sunrise, arriving at the top at sunset. He meditated all night and the next day at sunrise began his trip down the moun-

tain, arriving home at sunset. Is there a place on the path where the monk was at the same time of day on both days?

At our next meeting I told the class that I was interested in the thoughts and questions they had asked themselves in their attempts to clarify the monk scenario, and I asked them to write down some of their first thoughts. There were three categories of response. The 'personal' response is in narrative form; it begins with many embellishments to the story, and the questions asked do not address the problem directly at all at first. The following is a typical 'personal' response.

> What was the story really about? Was there some hidden meaning? Why did he climb all the way up the mountain only to come back down next day? Was he with anyone else? Is he crippled? Is the path old and beaten down, or is it a new one?
>
> Is he traveling at a constant speed? Did the monk travel down the same side of the mountain he came up? I assumed that he did, otherwise the sun wouldn't be seen on the other side at the same time. Is the mountain facing East? (the side he is climbing?)

The 'non-personal' response is a list or outline advancing a procedure or formula for solving the problem. Here is an example.

> At first I thought of it as a rate problem. Then I looked at just the information given. I put it in this form:

> If his velocity were constant the problem would be easy. If it changed during his path, then an equation of his velocity would be needed going up and going down. The equations then have to be set equal to each other to see if they yield the same result at a particular point in time.

The third response contained elements of the above two. Although there was some overlap, the female students typically wrote the personal responses and the male students wrote the non-personal. The female students tended to add context to the problem and to look for relationships to their daily lives before attempting to solve the problem. The male students tended to strip away any context and to view the problem as a 'type' (velocity, rate, etc.) problem.

A striking difference between male and female views of mathematics was shown in the fall of 1978 when I gave an open-ended questionnaire to 32 females and 22 males in a basic mathematics course at Cornell University. Most of the students were junior transfer students who had been away from mathematics for several years. What was outstanding about the questionnaire responses was the way in which the female students 'over-rode' the questionnaire. They inserted different response choices, amended the ones that were there already, and checked more of the responses to a multiple-choice question per person than did the men. Overwhelmingly they gave a 'personal' completion to the statement stem: "Based on your many years of schooling, please complete this sentence. Mathematics _____." I categorized the responses as 'personal', 'borderline', or 'non-personal'. Here are examples from each category.

> Personal: Mathematics is something I took in high school simply to get into college where I hoped I wouldn't have to take any more. I enjoyed geometry, hated trig and algebra, but did well in honors courses in all three.

> Borderline: Mathematics can be a very interesting and challenging subject. Mathematics is something that will help me in my chemistry and science.

Non-personal: Mathematics is the study of numbers which are important in business and in many aspects in life as well as in science.

The following table shows the results of the observation.

Mathematics _____

	Female (32)	Males (22)
Personal	24 (75%)	9 (41%)
Borderline	3 (9%)	1 (4%)
Non-personal	5 (15%)	12 (54%)

Male students often gave a definition of mathematics or a generality about its use in science. The female students related mathematics experience to themselves personally.

A third example comes from one of the most exciting mathematics courses of my career. This past summer, 1982, I offered a basic mathematics course for adult women in my community who had been away from mathematics for many years. The women were enthusiastic and eager as well as anxious. As the course progressed the women came to accept and even relish their own ways of seeing. Here is how one of the women said it.

> Basic Review Math has allowed me to picture math in another light, to get an overall view. From this stance I can "see" how principles are built upon each other and just how ordinary and everyday math is. Not far removed, but as close to us as nature. ... In retrospect I believe my breakthrough came when I no longer focused in terms of "their" code, but positively sought to identify and relate with the whole communication issue.

Another woman in the class wrote:

> ...it is important that I think mathematics grows out of the same impulse which created the rest of language: that impulse to know our world.

Women want to be culturally bi-lingual, e.g., able to understand scientific thinking and able to translate it into daily lives and the normal language of communication.

My experience forces me to consider the possibility of a "women's view of mathematics" and what it might mean when women are encouraged to ask and pursue their own questions. Often it is less the need for more information that is needed to solve a problem than it is the ability to restructure the problem in order to analyze it using the repertoire in one's particular background.

David Henderson, mathematician at Cornell University, writes, "Recently, I was thinking back over the times that my perception of mathematics had been changed by the insights or questioning of a person in my class. Suddenly I realized that in almost all of those cases the other person was a woman or from a different culture than my own. I don't think that this is just a coincidence."

Gestalt psychologist Abraham Luchins and mathematician Edith Luchins report that girls tend to interpret the instructions for their water jar and geometry experiments differently than do boys. In a personal letter to me Dr. Edith Luchins wrote, "...I am intrigued by your reference to a sense of responsibility and freedom through creating mathematics and the notion of an evolving mathematics. So many women students, we found, were repelled by the idea that all is cut and dried in mathematics."

Mathematics educator Dorothy Buerk recently completed a study in which she worked with articulate, intelligent, math-avoiding women whose conception of mathematical knowledge was dualistic but whose perspective on the rest of the world was at high Perry position. She found that those women avoided mathematics as a body of facts to be recalled rather than as a discipline involving relationships that one can work through.

I propose we continue the investigation of concepts of mathematics by listening to the questions women ask. This research will provide a deeper understanding of the beliefs and feelings that drive women's mathematical behavior. The research also will broaden our conceptualization of mathematics itself. David Henderson describes the situation: "Over the recent centuries the people in charge of mathematics, as we culturally define it, have been mostly Western (white) upper/middle class males. So it should not be surprising if this has instilled a bias into our conception of mathematics. I see evidence for this, but I do not claim to see it all clearly."

We know that generating good questions is crucial in the development of mathematics. David Hilbert's list of problems presented at the 1900 Mathematics Congress set the direction of research for this century. Carol Jacklin claims that "in question-generating we can expect to see a further change in the content of the discipline as women enter each field." Thus, this investigation will give insights into the ways in which the development of mathematics is enhanced by the unique contributions of women.

Further, a look at the process of forging connections may shed light on some typical and puzzling forms of disconnectedness such as the student who does poorly in math class and on tests but does sophisticated ratio problems outside of school. In educational assessment, a recognition of a feminine construct of mathematics may result in assessment materials that indicate in a more revealing way the mathematics capabilities of both sexes.

Description of the project

The procedure of the investigation will take on at least three forms. One form will be a meeting of those interested in or who have begun investigations into this area. This seems to be a small number of people who do not know each other but with whom I have been in contact. Announcements also will be placed in the AWM and WME newsletters. One purpose of the meeting is to formulate individual research projects (1) that each person can perform in his/her own school or community and (2) that will contribute as a whole towards a better understanding of the female conceptualization of mathematics.

Another form of the investigation will be the examination of materials already produced that could reveal sex-differences in mathematical problem-posing. Some sources for such materials are:

* transcripts, data, papers obtained by researchers in the course of their own research. For example, I could look at protocols of pairs of students solving math problems (such as those obtained by Alan Schoenfeld in his investigation of executive monitoring in problem-solving), concept maps on which students indicate the relationships they see between and among concepts (such as those designed by Joe Novak and D. Bob Gowin), or tapes of interviews (such as those from the project on Education for Women's Development co-directed by Blythe Clinchy, et al.).
* papers written by mathematics students as a result of writing assignments in their math classes.
* observations of those involved in mathematics anxiety or avoidance programs or learning development centers.

A third form of the investigation will include the design of situations or environments out of which mathematical questions can be generated. These situations will be presented to various audiences under various guises. A useful strategy may be to present these situations to intellectually sophisticated women who have been away from mathematics for several years but who now are willing to investigate math ideas. My experience has been that these women are reflexive in their thinking and articulate enough to describe their thought processes well. They can be encouraged to push their "wrong" questions to a conclusion. Methods of observing questions students generate in the process of solving problems development by Stephen I. Brown (who encourages problem-posing with his "What if Not" procedures) may be used.

The meeting of those interested in contributing to the project will be held in June, as early in the summer as possible. Documents will be procured and analysis begun Summer, 1983. Situations will be presented at various schools by me and by others willing to participate during Fall semester. There will be ongoing refinement

of the question-generating situations as well as of the methods by which they are presented. Analysis of documents will help detail the criteria that will define the refinements.

Spring of 1984 will be spent analyzing the results of the presentations of the situations and in rerunning some of them. Research reports will be written and disseminated to newsletters and journals (such as the AMI and M-E Newsletters, Mathematics Teacher, For the Learning of Mathematics, and other relevant publications). Presentation proposals will be made to American Educational Research Association, National Council of Teachers of Mathematics, Adult Education Research Conference and other organizations.

National significance of the project

A goal of education is for thinking, feeling and acting to come together as an individual so as to make that individual feel his/her own power to take charge of his/her world. Some suggest that an emphasis on civics courses will satisfy this goal. This may be true, but I think that an essential element of any course attempting to satisfy this goal is a means of helping the students recognize and accept their own intelligence. Many students are afraid to take charge of their learning, or they "forget" what you know they knew perfectly well yesterday. It is essential that the student regain confidence in his or her ability to learn and in the value of their own experiences. Students become accustomed to feeling that knowledge they learn on their own is not as worthwhile as that which they can find in a book or hear in a lecture. Students need to be reminded of what they already know and helped to see the power of using what they know as a basis for further learning and action.

The decline in mathematics standardized test scores, the worry of a computer elite, the rapid advance of serious technological decisions that we as a nation must make all are stimuli for this project. A claim is that people accept power and take reasonable responsibility when they are allowed to ask and pursue their own questions. For most women and many men mathematics seems dispassionate and outside the realm of normal human considerations. This myth is the crucial filter.

Our future heavily depends on science and technology. But it is difficult for women mathematicians to sustain their satisfaction with mathematics in their present situation. If math thinking is gender-specific and missing certain essentials, then it will not be satisfying over long periods of time for many women. Women views truly are needed and missing, and women's ways of seeing will produce new results. Seeing math in a personal way need not mean naive, unconscious subjectivity but rather awareness of our inner self-monitors and the asking of our own questions.

COMPUTER SCIENCE RETRAINING PROGRAM

A summer program, the Institute for Retraining in Computer Science, has been organized under the auspices of a joint ACM-MAA committee. Classes are held for two consecutive summers, with a year-long project in the middle. Applications for next year's beginning class are due in late December. More information will follow in the next issue of the Newsletter, but you may want to go ahead and send in for your application forms because they have to go through the mills of your institution's administration.

For application forms and more information, write:

Ed Dubinsky
Dept. of Mathematics & Computer Science
Clarkson College
Potsdam, NY 13676.

ON CAMPUS WITH WOMEN

reprinted from the publication of the same name published by the Project on the Status and Education of Women, Association of American Colleges, 1818 R St., N.W., Washington, DC 20009

Fall 1982

$2 Million in Attorney's Fees for Sex Bias Case:

A former chemistry professor who sued the University of Minnesota for sex and race discrimination when she was denied tenure in 1973 won $100,000 in an out-of-court settlement in February 1980 (Rajender v. University of Minnesota). Two years later, a federal judge has awarded almost $2 million in attorneys' fees to the lawyers who won the federal class action case against the university. Discouraging discrimination was a key reason for the hefty fee package, which is the largest such award on record against an academic institution.

Another new beneficiary of the class action settlement is a kidney disease specialist at the University of Minnesota Medical School who claimed that she had been an assistant professor longer than her male colleagues before being promoted in December 1981, and that she had not been given promotion, salary, tenure, or clinical responsibilities equal to those of her male colleagues. The plaintiff was awarded a settlement of $97,680. Six other women have received settlements in the case thus far, and close to 250 additional complaints await resolution by three special court-appointed masters. The settlement decree ordered the university to appoint faculty advisors to assist women wishing to file sex discrimination claims, to implement a consent decree for the university's other non-student female employees, and to provide faculty advisors with an on-campus office, a secretary's salary, supplies and $7500 for expenses.

The decree also established a Faculty Senate Equal Employment Opportunity for Women Committee which monitors the implementation of the decree. The Faculty Advisory Committee for Women recently obtained a court order to end the university's practice of maintaining strict confidentiality in the hearings and findings of grievance panels, making them now open to all faculty.

Confidentiality of Tenure Vote Not Part of Academic Freedom:

Letting stand an appellate court ruling which held that University of Georgia Professor James Dinnan had illegally tried to put himself above federal law by wrapping himself in the robe of academic freedom, the Supreme Court rejected the professor's final legal plea to preserve the confidentiality of the now-famous tenure vote he cast in 1979. Rather than reveal to a federal court his vote in a review panel denying tenure to assistant education professor Maija Blaubergs, Dinnan served 90 days in jail and paid a fine of $3,000. Blaubergs had had Dinnan called to the witness stand in an effort to prove her sex bias case against the panel.

Excerpts from interview with Dr. Bernice R. Sandler, Executive Director of the Project on the Status and Education of Women:

Q. How did you get involved in women's issues in education?

A. I became interested in women's issues somewhat by accident. I was teaching part-time at a local university and was well on the way to becoming a "queen bee"--the type of woman who believes that there is no discrimination because after all she has a good job. (She usually compares herself to other women, and not to men.) When I finished my doctorate, I wasn't considered for any of seven openings in my department, so I asked a friend on the faculty "why." He told me I came on "too strong for a woman." That got me thinking. I had two more similar experiences within the next few weeks. I was job hunting and applied at an employment agency. The interviewer looked at my application and stated "You're not a professional; you're a housewife who went back to school." That got me thinking some more. The next experience involved an interview for a job for which I was very well-qualified. The director of the company spent a half-hour telling me that he had nothing against hiring women, but... And he proceeded to tell me how much "trouble" it was to employ women. These experiences shook me up. I had always believed that being a "golden girl" and doing an excellent

job was enough. And yet here it was becoming abundantly clear that that was not enough. Somehow, I was of the "wrong sex."

I became interested in women's issues from that point onward. I started reading about discrimination against women but there was very little written in those days. I began to examine the laws prohibiting discrimination, innocently believing that anything as immoral as sex discrimination must also be illegal. But in 1970 that was not true. For one reason or another the laws that then prohibited discrimination exempted women faculty, administrators and students.

Among the materials I read was a report by the Equal Employment Opportunity Commission, which described these anti-discrimination laws as well as something called Executive Order 11246. This order prohibited federal contractors from discriminating in employment on the basis of race, color, religion and national origin. There was a footnote, and being an academic, I turned to the back of the report to read the footnote, which simply stated that the Executive Order had been amended to include sex. I had a real "Eureka" experience. I literally shrieked aloud, for I had made the connection that institutions had federal contracts, and as such, could not discriminate against employees on the basis of sex. From there it was only a short leap to working with WEAL (The Women's Equity Action League) where I planned and spearheaded the strategy to get the Executive Order enforced, filing charges against more than 200 universities.

Q. The Project on the Status and Education of Women is the longest-running national project dealing with women in education. How did it get started?

A. In 1971, women's issues on campus were just emerging. The Association of American Colleges began to explore these issues when their women's college members and others raised them. AAC obtained funds from Carnegie, Danforth and Exxon Foundations and was the first of the national educational associations to have a formal women's project. It took a bit of risk on the part of AAC--after all in those days women's issues were still seen by many as somewhat "freaky" and off the beaten track. I was hired to implement the Project, which was to last only two years. I was very naive in those days. I thought that if you passed a law or two the problems would be solved within a few short years, and I would go on to another job.

Q. What do you see as the major accomplishments of the Project?

A. That's a hard one to answer. I think we have played a major role in educating both men and women, institutions and women's organizations about the problems of discrimination against women students, faculty and administrators, and to help them understand what the federal government requires and does not require, and to help them develop new policies and practices to make colleges and universities more responsive to the issues affecting women on campus.

The Project strives to be on the cutting edge--identifying emerging issues and providing recommendations to overcome barriers to educational equity for women. Over the years, we've had a long list of "firsts" such as the first series of papers on minority women in education; the first chart explaining the laws that deal with sex discrimination at educational institutions; the first comprehensive analysis of Title IX and discrimination against women in intercollegiate athletics and sports; the first analysis of the Age Discrimination Act as it applies to older women on campus; the first nationally distributed paper on sexual harassment in academe; and the first comprehensive analysis of how women students are often treated differently than men in the classroom.

We handle as many as 20,000 requests for information a year. Sometimes it's just someone asking for a paper we've developed; sometimes it's a reporter wanting background information for a story; sometimes it's an institution asking for advice on a particular policy; and sometimes it's staff from the Congress, the Department of Education, the White House, or elsewhere looking for information. The information we develop and give out often has a ripple effect.

What we have tried to do is provide institutions and others with the information they need in order to act on the basis of knowledge and not hearsay, and to help women on campuses across the country become more responsible advocates for their own rights.

Q. Can you give some examples of how the Project has made a difference?
A. Our papers often have a direct effect on campus programs and policies. For example, one campus used our fifteen-paper series on re-entry women as the basis for a self-evaluation of programs to determine whether re-entry women were being served adequately by the university. Several campuses have distributed our "Classroom Climate" paper to their faculty and conducted workshops based on the information in the paper. Our materials have been used at innumerable training conferences. Our paper on sexual harassment spurred several campuses to develop policies prohibiting such behaviors.

Institutions around the country consult us for information about Title IX and other federal policy issues. Sometimes they'll call us to see if a particular policy or procedure is in compliance with the law. Often they would rather call us than the Office for Civil Rights at the Department of Education. It's not unusual for a campus to call us as they are developing a policy. Sometimes they want to know if any other campus has a particular policy, and we can put them in touch with other campuses. Our materials on Title IX over the years have helped people throughout the academic community to understand what the law requires. Often when I travel, I see our chart about federal laws on an office wall.

Q. What are the major challenges facing women in education today?
A. Some of the problems are almost the same as they were before, particularly in terms of women employed as faculty and administrators. We've made progress rather slowly in these areas, and until we have lots of women well represented at the highest levels as well as on the faculty, we don't have equity. What could a university look like if its President, and half of its deans and faculty, trustees, and graduate students were female? Right now, about the best we can say about most co-ed institutions is that about one-half the undergraduate students are female.

There is also a misguided complacency that leads some people to believe that the problems of women on campus are essentially solved and it's just a matter of time until the women in the pipeline move upward. Unfortunately the data don't support that notion. The percentage of full professors who are female is just about the same as it was about 12 years ago when the Project began, despite the increase in the number of women at the assistant professor level. Women don't get promoted as fast as their equally qualified male colleagues.

We are also faced with increased attacks on the federal legislation and a pull-back in enforcement and other federal programs to aid women in education. While I doubt that Title IX will be repealed, it is not inconceivable that it could be weakened either legislatively or by changes in the regulation. In fact, the current administration has proposed such changes in the regulation already.

A good deal of work needs to be done to encourage women into nontraditional fields. I worry whenever I see pictures of young people working on computers, and the number of females is pathetically small. Despite the marked increase in the number of women in medicine and the law, the majority of women students are still majoring in the so-called "feminine" fields, such as education.

Other issues include how to include the new scholarship on women in the mainstream of the curriculum; and a host of subtle issues involving the relationship of men and women as colleagues, faculty and students on campus.

When I first began working on the problems of women in education, I saw them in a rather limited and simplistic fashion: student admissions, hiring, promotion, and salary issues were the problems I saw. Now my list of issues, while not infinite, is substantial, and new issues keep getting added. Who would have thought of sexual harassment as a campus issue in 1970? Or sports? Or pensions, part-time tenure, minority women, older women, disabled women, campus security, financial aid, sex bias in research, and so forth. Almost every issue and area on campus has a women's component. And perhaps that's one of the reasons women's issues are exciting to work with. It's like having a new set of glasses--you can look at everything with "fresh" eyes, and there is a new perspective on old issues.

Sex Differences in Math Ability: No? Yes? Maybe?:

No consistent differences emerged between the sexes in a recent study on ability

to learn math. These findings of researchers Zalman Usiskin and Sharon Senk of the University of Chicago and Roberta Dees of Purdue University contradict those of a 1980 Johns Hopkins University study by Camilla Perrson Benbow and Julian C. Stanley, which attributed greater aptitude for math reasoning to boys than to girls. Papers by Senk ("Achievement in Writing Geometric Proofs") and Dees ("Sex Differences in Geometry Achievement") will appear shortly in the ERIC system. For ordering information, write to ERIC Document Reproduction Service, P.O. Box 190, Arlington, VA 22210. A report on the Benbow and Stanley study, "Sex Differences in Mathematical Ability: Fact or Artifact?" appeared in the December 12, 1980 issue of Science, #210.

Another study, also done at Hopkins and funded by The Ford Foundation, showed the need for more research to determine why fewer women than men choose careers in science, engineering and other fields which require a heavy background in mathematics. According to some research, social attitudes play a larger part in keeping women from studying math than lack of innate ability. However, more work is needed to learn how women can be encouraged to major in math and then to choose careers in math and other quantitative fields.

Free copies of the 40-page study, The Problem of Women and Mathematics, which reviews and critiques the literature and contains over five pages of references, are available from The Ford Foundation, Office of Reports, 320 East 43rd St., NY, NY 10017.

National Science Foundation Report:

Women and Minorities in Science and Engineering, a report by the National Science Foundation, gives biennial statistical data on recent trends in the participation of women and minorities in science and engineering employment and training. Although data are extensive for women and minorities, very little data is presented by race and by sex (i.e., minimal information on minority women). Copies of the 124-page report may be obtained at no charge while supplies last from Forms and Publications, National Science Foundation, 1800 G St., NW, Room 232, Washington, DC 20550. Use Order No. NSF 82-302.

Still Few Women in Science--Why?:

Contributions of notable women scientists and reasons for the continuing underrepresentation of women in science are discussed in an article in the April 26, 1982 issue of Current Contents/Life Sciences (#17), the weekly publication of the Institute for Scientific Information. The article, "Why Aren't There More Women in Science?" by editor Eugene Garfield, also includes a listing of the 27 most-cited female scientists for the period 1965-1978 and a sampling of comments from women scientists today. Copies of the article are available at no charge from the Institute for Scientific Information, 3501 Market St., Philadelphia, PA 19104, Attn.: President's Office.

Two Surveys, One Conclusion: Across the Board, Women Faculty Still Earn Less Than Men:

At every rank and type of institution, men's salaries exceeded those of women, who averaged 95 percent of men's earnings, according to a recent salary survey by the American Association of University Professors (AAUP). One of the widest pay differentials was found among full professors at major research universities, where women's salaries were eleven percent less than those of their male counterparts. The survey also showed salary increases for women to be smaller, on the average, than those of men at the same category of institution. The results confirm earlier findings of the National Center for Education Statistics (NCES), which conducted a survey of salaries, tenure and fringe benefits of full-time instructional faculty. The NCES survey showed the average woman teacher earning nearly $5,000, or 18.5 percent less than the average man, and women faculty gaining only an 8.8 percent salary increase contrasted to men's 9.3 percent hike. In addition, the NCES report showed the widest salary discrepancies to be at private schools, with 1981-82 salaries averaging $25,536 for men as compared to $19,591 for women. A higher percentage of women were on the faculties of two-year colleges (38 percent) than at universities (19.6 percent). Among four-year colleges, women made up 27.5 percent of the faculty.

Overall, the percentage of faculty positions held by women at these colleges marked an increase of only 0.1 percent over 1980-81, with women holding 54 percent of instructorships, but only 10.9 percent of the professorial positions. While 69.7 percent of male faculty were tenured, only 50 percent of female faculty held tenure.

Copies of the AAUP survey, Report on the Economic Status of the Profession, are available at $20 from AAUP, One Dupont Circle, Suite 500, Washington, DC 20036. Single copies of the NCES report, Faculty Salaries Up 9.2 Percent in 1981-82, are available free of charge while supplies last from the Statistical Information Office, NCES, 1001 Presidential Bldg., 400 Maryland Ave., SW, Washington, DC 20202.

Another study shows that the discrepancy between the salaries of minority and white administrators in academic institutions is less than the discrepancy between the salaries of men and women in the same positions. It includes salary information about 40 different administrative positions. The study, 1981-82 Administrative Compensation Survey, is available for $125 from the College and University Personnel Association, 11 Dupont Circle, NW, Washington, DC 20036.

Winter 1983

Free-loan Film on Science for High School Students:

A film, exploring the question of why young women are "turned off" by high school math and science, looks for answers through women who are already established in science careers, and through the perceptions of parents, counselors, and teachers. Science: Women's Work presents the message that, by taking math and science courses, high school women keep open a variety of choices for satisfying, well-paying careers later. The 16mm sound and color film (27 minutes) was produced by the National Science Foundation and may be of use to colleges in recruiting students for scientific programs. Free-loan prints are available from Modern Talking Picture Service, 5000 Park St. North, St. Petersburg, FL 33709. Borrowers pay return postage only.

Whatever Happened to That Woman Who Sued Her Department?:

An overview of what happens to sex discrimination lawsuits is described in an article based on interviews with 20 faculty women who filed charges of sex discrimination against their institutions. The article describes the process, from decision to sue, through gains made by the litigation. The author notes that, "although it is clearly impossible to measure precisely the impact of a particular case on the position of women faculty on that campus, the grievants were frequently convinced that their struggles had been responsible for major improvements in the position of other women," despite retaliation, and other emotional and financial costs. The article, "Collective Protest and the Meritocracy: Faculty Women and Sex Discrimination Lawsuits" by Emily Abel, appeared in Feminist Studies 7, No. 3 (Fall 1981). Single copies of the issue are available for $6 (individuals) and $12 (library or institution) from Feminist Studies, c/o Women's Studies Program, University of Maryland, College Park, MD 20742.

INSURANCE COMPANY SUPPORTS NOW PROTEST

press release, June 8, 1983

Consumers United Insurance Company (CUIC) today announced its unqualified endorsement of the National Organization for Women's nationwide protest against sex discrimination in insurance. Robert T. Freeman, Jr., president of CUIC, said, "The question is not one of actuarial data, but one of dignity. This is not a debate over equations. It is one, rather, of equality." Freeman emphasized that the issue must be resolved on moral, philosophical, and ethical grounds: "All American citizens should be treated equally. We should have one experience table showing the over-all

experience of all Americans and not one for Blacks, not one for women, not one for different ethnic groups or any of the dozens of other ways Americans can be subdivided on arbitrary grounds."

CUIC supports premium rates based on all-American experience tables for life, accident, health, and other kinds of insurance. The deviation from the standard premium rates should be based on sound underwriting practices that include factors like life and health styles, smoking and exercise habits, weight, occupation, and other personal choices that directly affect mortality and morbidity tables.

The Washington-based insurance company--the largest worker-owned and worker-managed firm in the country--practices what it preaches. It offers life and health insurance policies that conform to the proposed non-discrimination legislation now before Congress. CUIC is the only insurance company in America that has testified in favor of the legislation before subcommittees of the U.S. Senate and House of Representatives.

DEADLINES: Sept. 23 for Nov.-Dec., Nov. 23 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 material except ads to Anne Leggett, Dept. of Math. Sci., Loyola University, 6525 Sheridan Rd., Chicago, IL 60626. Send everything else, including ads, to AWM, P.O. Box 178, Wellesley College, Wellesley, MA 02181.

Job Ads

Institutional members of AWM receive two free ads per year. All other ads are $10 apiece and must be prepaid. The vacancies listed below appear in alphabetical order by state. All institutional members below are Affirmative Action/Equal Opportunity employers.

University of Alabama, Birmingham. Mathematics Dept. Chairperson of Department. Required: proven research and teaching with leadership experience. Rank: Professor. Salary commensurate with qualifications. 12 month appointment Sept., 1984. To ensure proper consideration send application by 12/2/83 to Richard J. Crittenden or Robert M, Kauffman, Dept of Mathematics, University of Alabama, University Station, Birmingham, AL 35294.

Sonoma State University. Computer Science Dept., Rohnert Park, CA 94928. Tenure track position as Asst/Assoc/Full /Professor to begin Jan. 23, 1984. Appointment level dependent on qualifications and experience. Send complete resume and 3 letters of recommendation to Computer Science Search Committee, School of Natural Sciences, Sonoma State University, Rohnert Park, CA 94928. Screening will begin Sept. 30, 1983.

University of California, Santa Barbara. Mathematics Dept., Santa Barbara, CA 93106. Professor James B. Robertson, Chair. Anticipate several temporary, part or full time, teaching appts during 84-85 year. Anticipate both part-time visiting positions & full-time visiting lectureships at a junior level (with possibility of renewal up to maximum of 2 years). Prefer active research mathematician or statistician with certifiably good teaching skills. We encourage applicants in all research areas. Please send vita, publications list, letters of recommendation on teaching & research, and financial requirements by 2/15/84 to Chair.

Connecticut College, New London. Dept. of Mathematics. Asst Professor in Math/Comp Sci. Very selective, coeducational, private, liberal arts institution (1600 students) located on Long Island Sound midway between New York City and Boston. We invite applications from Ph.D's committed to scholarship and teaching (3 courses per semester). Courses are in introductory and advanced computer science and mathematics. Our computer resources include a PRIME 550II, a PDP11/44 (UNIX), and several micros. Starting date of either 1/84 or 9/84 is acceptable. Send resume & 3 letters of recommendation to: S. Wertheimer, Chmn., Math. Dept., Box 1614, Connecticut College, New London, CT 06320.

Purdue University. Dept. of Math, West Lafayette, IN 47907. M. S. Baouendi, Head. (1) Several regular or research asst. professorships 8/1984. Required: exceptional research promise & excellence in teaching. (2) Possible one assoc. prof/professorship 8/1984. Required: excellent research credentials. For all jobs send resume & 3 letters of recommendation to Head.

Goucher College. Dept of Math & Computer Science, Towson, MD 21204. Professor Robert Lewand, Chmn. Asst. Professorship Fall, 1984. Teaching undergraduates at all levels both math & computer science. Average load: 9-11 hours per week. Ph.D. required. Salary from $21,000 depending on experience. Send vita, transcripts of graduate work & 3 letters of recommendation to Chmn.

University of Maryland. Dept of Math, College Park, MD 20742. Prof. John Osborn, Chmn. Possible tenure or tenure track positions 8/1984. Rank & salary depend on qualifications. Required: exceptionally strong research program. By 2/1/84 send vita, description of current research & at least 3 letters of recommendation to Chmn.

Union College. Dept. of Math, Schenectady, NY 12308. Theodore A. Bick, Chmn. Asst. Professorship, tenure track, 9/1984. Two courses per term, three terms per year. Salary competitive, depends on qualifications. To succeed in tenure track excellence in teaching & research are required. Send resume and 3 letters of recommendation (at least one of which discusses teaching) to address above.

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The AWM membership year is October 1 to October 1.

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Contributing Member $20 or more in addition to regular dues _____

Association for Women in Mathematics
P. O. Box 178, Wellesley College
Wellesley, MA 02181
September/October, 1983

H.K. Nickerson
184 Washington Rd.
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