

Association for Women in Mathematics

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NEWSLETTER

May-June 1985

PRESIDENT'S REPORT

Anaheim Meeting. At the business meeting, the question of affordable child-care at annual meetings was brought up. This question has come up before, and the following are problems: different states have different laws about who can perform child-care at such functions, it is extremely difficult to estimate how many people will take advantage of what arrangements are made, making any arrangements takes a lot of time. The people in Providence are willing to obtain information about child-care at meetings sites and to help arrange space, but they are not willing to take on the obligations of setting up child-care. I suggest we handle this in the same way we handle the roommate question at meetings. If there are one or two people who are willing to serve as a clearing house for baby-sitting needs, to obtain and disseminate information from Providence, and to arrange for space with Providence, they would provide a valuable service to the community.

The question of listing our members in the Combined Membership List of the mathematical societies came up at the executive meeting. Upon investigation, we discovered it would be very expensive to add all our members to the list. However, it would not be impossible to indicate whether a person already listed in the CML also belongs to AWM. We now have to decide whether this would be worthwhile.

Grants and Fellowships. The Sloan Foundation has announced 90 research awards to 8 women and 82 men. There were 20 winners in mathematics; only one of them is a woman. Congratulations to Lai-Sang Young, Michigan State University.

According to the *New York Times*, the continuing small number of awards to women has led the foundation to check its screening process. Since this is not a fellowship that one can apply for, the nomination process is also important. One has to be nominated by a department chair or senior scholar. We suggest that members be aware of this and encourage the chairs of their departments to make appropriate nominations.

Sigma Delta Epsilon Graduate Women in Science, Inc., offers Eloise Gerry Fellowships and Grants-in-Aid to encourage research in science by women. For further information write to them at 9650 Rockville Pike, Bethesda, MD 20814.

We Still Have a Way to Go. (Thanks to Linda Ness) Reprinted without permission from a quiz called "How Much Do You Know About Yourself?" which appeared in the January, 1985 issue of *Good Housekeeping*:

T F "15. You cannot possibly be as good at math as a man is.

Answer: TRUE. At age two, girls do just as well as boys in counting, and in the lower grades at school they master arithmetic problems as readily as boys do, but by the time adolescence is reached, boys generally show greater math ability.

Considerably fewer girls used to take advantage of high school or college math courses, let alone become physicists, engineers, or computer scientists. It is likely that this imbalance was a conditioned response, caused by the fact that until quite recently, it was not considered feminine in our society to be too successful in areas that have traditionally been the male's preserve."

Statistics:

From the WEAL (Women's Equity Action League) Washington Report June/July 1984:

"Although there has been an 80% increase in the number of women college presidents since 1975, women still hold only 9% of these jobs nationwide. Women faculty have not significantly increased their numbers since 1970. As of 1983, they constituted only 10% of full professors while they were 52% of the instructor rank. The 1982 gap of 15% lower salaries for women faculty has widened to 19% in 1983-84. As educational institutions face severe economic problems, and the level of support from government declines, this is not likely to improve."

From COMPUTERWORLD Feb. 11, 1985:

"Women in computer professions earned almost 22% less last year than men in the same jobs, according to figures released recently by the Bureau of Labor Statistics." The article goes on to say that entry level salaries are about equal and that the discrepancies develop later.

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SPEAKERS' BUREAU UPDATE

by Jeanne LaDuke, Associate Editor

In a summer 1975 issue of the *Newsletter* the first Speakers' Bureau list appeared. It contained the names of ten AWM members and had been compiled by Alice Schafer. This summer, ten years later, a greatly expanded descendant of that first list will be published. Once again, the compilation is occurring under the direction of Alice Schafer.

A great deal has happened in that decade. The number of speakers has grown from the original 10 to 165 now listed in the Wellesley office. Grant money for the Speakers' Bureau has been sought and obtained. A grant of \$1000 from Polaroid in 1977 was used for the publication of the first booklet for distribution. Stephanie Troyer was in charge of that phase. Then a grant of \$20,000 from the Alfred P. Sloan Foundation in 1982 permitted a greatly expanded operation including the publication and distribution of booklets in 1983 and in 1984 and reimbursement for travel expenses as well as honoraria, if desired, for the speakers. For this critical stage, from the fall of 1982 until the end of August 1984, Judith C. Wason was Director of the Speakers' Bureau. The special importance of the Sloan grant and the excellent administration of the Bureau for the major period of that grant by Judith Wason cannot be overemphasized. So far 66 talks have been given under the sponsorship of the Speakers' Bureau during the period of the Sloan grant, and many are scheduled for this spring and next fall.

From September 1984 until January 1986, Alice Schafer, Past President of AWM, is again serving as Director of the Speakers' Bureau. These Directors have developed the current network of coordinators, have overseen the publication and distribution of booklets, have arranged for advertisement of the program, and have encouraged the growth of the speakers' list. They have also sought and received

important support and cooperation from other professional organizations such as NCTM, MAA, AMS, and SIAM and from groups with related interests such as WAM. Pamela G. Coxson, a Fellow at the Bunting Institute at Radcliffe, will assume the directorship beginning January 1986. At that time, she will be on the faculty at Ohio State University, Columbus. She has spoken at a number of high schools and colleges in the New England area and is planning the high school day for the Kovalevskaya Symposium in October.

A new brochure is being compiled in the Wellesley office. It is expected that it will be completed in the late spring, published during the summer, and ready for distribution in the fall. An application form is included in this *Newsletter*: all who wish to join the Speakers' Bureau are asked to fill it in and return it to the Wellesley office. Also, those wishing to change topics, add new topics, or change addresses in their current listings are requested to use the application for these purposes.

Talks or panel discussions at all levels, elementary school through college, are appropriate activities for Speakers. Speakers now are reimbursed for expenses up to \$150 and may request an honorarium up to \$50. It is expected that some funds will continue to be available for such reimbursement. One must be an AWM member to be eligible for funding. Expense report forms may be obtained by writing to AWM, Box 178, Wellesley College, Wellesley, MA 02181.

What can you do to contribute to the important task of encouraging and supporting women with interests and talents in mathematics? Seek out audiences who might wish to take advantage of the program. For example, career days at high schools may provide such opportunities. (It is all right to talk to audiences including males as well as females.) If you can't speak, find people who can. Seek out non-academics as well as academics. Invite speakers to your institution. Join the Speakers' Bureau by filling out and sending in the application in this issue of the *Newsletter*.

LETTER FROM THE EDITOR

The students in the Math Liaison at Simmons College in Boston joined AWM last fall as a student chapter of AWM. Through the Speakers' Bureau they invited Ann Hibner Koblitz to speak at Simmons on November 14. Mary Thomas, a member of the chapter, wrote an article for *The Janus*, the Simmons student newspaper. The article consisted mainly of a summary of Koblitz' talk, "The Mythification of Sofia Kovalevskaja." The article ends:

Dr. Koblitz reminded her audience, "Kovalevskaja was, after all, not only a full-time professor of mathematics, active in her research, editor of a scholarly mathematics journal, but a single parent as well," and all at a time when it was not fashionable, realistic, or acceptable for a woman to be in any of these roles.

The Project on the Status and Education of Women has produced a sequel to "The Classroom Climate: A Chilly One for Women" called "Out of the Classroom: A Chilly Campus Climate for Women?" This paper, by Roberta Hall and Bernice Sandler, is as good as the first one. Individual copies are available for \$3 from the Project on the Status and Education of Women, Association of American Colleges, 1818 R St., NW, Washington, DC 20009.

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HONORS AND AWARDS

Prof. Gudrun Kalmbach, Universität Ulm, has been listed in *Who's Who in the World*, seventh edition. Inclusion is "limited to those individuals who have demonstrated outstanding achievement in their own fields of endeavor and who have, thereby, contributed significantly to the betterment of contemporary society."

Shirley Kolmer of St. Louis University is a Fulbright Scholar for 1984-85. She will lecture on linear algebra at the University of Liberia.

The National Science Foundation (NSF) has announced the selection of 200 engineers and scientists to receive Presidential Young Investigator Awards. The awards, which fund research by faculty members near the beginning of their careers, are intended to help universities attract and retain outstanding young Ph.D.'s who might otherwise pursue non-teaching careers. The awards address the growing faculty shortages in highly competitive fields of engineering and science. This problem has become acute in fields such as engineering and computer sciences, but exists to some extent throughout scientific and technical disciplines.

Each recipient will receive up to \$100,000 per year for five years in a combination of federal and matching private funds. The awards carry an annual base grant from NSF of \$25,000. In addition, NSF will provide up to \$37,500 per year to match contributions from industrial sources. The individual universities are responsible for raising the non-federal funds.

Congratulations to the following Presidential Young Investigators:

- Kimberlee J. Kearfott, Arizona State University,
Dept. of Electrical & Computer Engineering, Tomographic Imaging.
- Alice M. Agogino, University of California-Berkeley,
Dept. of Mechanical Engineering., Mechanical Engineering/Design.
- Mary Vernon, University of Wisconsin-Madison,
Dept. of Computer Science, Computer Performance Analysis.
- Haeok Lee, University of Illinois-Urbana,
Dept. of Mechanical & Industrial Engineering, Heat Transfer.
- Katherine S. Shing, University of Southern California,
Dept. of Chemical Engineering, Thermodynamic Computer Simulation.
- Kristina M. Johnson, University of Colorado-Boulder,
Dept. of Electrical & Computer Engineering, Optical Communications.
- Linda M. Abriola, University of Michigan-Ann Arbor,
Dept. of Civil Engineering, Flow in Porous Media.
- Catherine E. French, University of Minnesota,
Dept. of Civil & Mineral Engineering, Seismic Analysis of Structures.
- Kim A. Stelson, University of Minnesota,
Dept. of Mechanical Engineering, Automated Manufacturing Systems.
- Deborah A. Joseph, University of Wisconsin-Madison,
Dept. of Computer Science, Theoretical Computer Science.
- Ilene J. Busch-Vishniac, University of Texas-Austin,
Dept. of Mechanical Engineering, Transducers and Acoustics.
- Janice A. Phillips, Lehigh University,
Dept. of Chemical Engineering, Biochemical Engineering.

NSF GRANTS

NSF Grants for Research on the Social and Behavioral Aspects of Science and Mathematics Education are available through the multidisciplinary Decision and Management Science Program, and other programs in the Directorate for the Biological Behavioral and Social Sciences (BBS), as well as through the newly established Directorate for Science and Engineering Education. In FY 1985, \$7 million is

available to support research topics that include interactions between student representations of knowledge in a domain, and processes for acquiring new knowledge; teaching and learning in specific disciplinary domains (e.g., chemistry, physics, biology, computer science); the quality of instruction, with the eventual aim of developing better teaching techniques and materials; incorporating advanced technologies, especially the computer, into science and engineering education; and evaluating artificial intelligence and other information processing models as a basis for improving teaching.

Research resulting from grants funded under this initiative should be clearly applicable to science and mathematics education. However, in keeping with the NSF mission, the research should address fundamental issues. For example, decision models that are based on realistic assumptions about the interdependence and instability of many social phenomena could improve the relevance of mathematics education to precollege students.

This initiative is expected to continue in FY 1986. Applications are prepared in accord with *Grants for Scientific and Engineering Research* (NSF 83-57). For more information about BBS support for research on mathematics and science education request Program Announcement NSF 84-74 from Forms and Publications, National Science Foundation, Washington, DC 20550; (202)357-7861. For more information about the Decision and Management Science Program contact Trudi C. Miller, Director, (202)357-7569.

The NSF announces the availability of grants for joint efforts between United States and Western European scientists. Various types of coordinated programs are eligible for funding, such as cooperative research projects, joint seminars (workshops), long-term research visits, and regional seminars. The NSF has specific programs with Belgium, Finland, France, the Federal Republic of Germany, Italy, Sweden, Switzerland, and the United Kingdom. However, selection will consider activities within the region as a whole, or with countries not specifically covered by formal programs.

Deadlines for application vary by the countries involved. Interested scientists should write: Data Support Services Section, National Science Foundation, 1800 G Street N.W., Washington, DC 20550.

The NSF will consider several types of interactions between United States and Latin American and Caribbean scientists for financial support. Such activities include cooperative research projects, research-oriented workshops, short-term visits for cooperative activities, and developing detailed plans for joint projects. To receive such grants, the co-principal investigators must submit parallel proposals. Foreign investigators may be affiliated with specific counterpart agencies of the NSF in Latin America and the Caribbean, or with other agencies, which will be considered on an ad hoc basis. U.S. investigators must hold a doctoral degree or equivalent professional experience, and be U.S. citizens. All branches of science and technology are eligible for consideration, so long as the goal of the project is the advancement of knowledge or methodology.

Proposals should follow the guidelines established by the NSF pamphlet 78-41, "Grants for Scientific Research." Yearly deadlines fall on May 1 and November 1; the NSF requests that submissions be restricted to these approximate time periods. The Cooperative Science Program is located in room 1212, 1800 G Street, N.W., Washington, DC, (202)357-8563. Correspondence should be addressed to U.S.-Latin American Cooperative Science Programs Division of International Programs, NSF, Washington, DC 20550.

In order to encourage cooperation between scientists in the United States and those in developing countries, the NSF is offering grants for a number of research activities in the third world. Grants are made directly to the U.S. scientists; this money may potentially be used to support counterparts in the host country. Local enthusiasm and planning for the proposed projects are considered essential to this program.

Categories of grant awards include research participation, conferences, and dissertation improvement. The latter grants are awarded to students from developing countries who are enrolled in universities in the United States, and who wish to undertake a dissertation project.

Those applying for principal investigator positions must be professionally qualified through training and work experience, and currently employed by a U.S. institution. Grant proposals are read twice a year, on March and September 1, but accepted at any other time. Proposals should be submitted in deca-copy to Central Processing Section, National Science Foundation, Washington, DC 20550.

For more information concerning programs in specific geographic areas, contact the following: North Africa and Turkey, Francis E. Field 202-357-9402; Sub-Saharan Africa, Robert Bell 202-357-9550; South and West Asia, Osman Shinaishin 202-357-9402; East Asia, Gordon Hiebert 202-357-9537; Latin America and Caribbean, Christine French 202-357-9563. All the above may be reached at Division of International Programs, National Science Foundation, Washington DC 20550.

SUMMERMATH FOR TEACHERS

Elementary teachers and secondary school teachers of mathematics will have a unique opportunity to explore recent developments in mathematics education at Mount Holyoke College's innovative program, SummerMath for Teachers. The college will hold two two-week residential institutes: July 7 - July 19, 1985, for teachers of grades 6-12, and July 21 - August 2 for teachers of grades K-8.

The central focus of SummerMath for Teachers is cognitive process instruction and instruction for developing problem-solving skills. Teachers analyze student error patterns and misconceptions, develop questioning techniques, review current research, and share ideas with colleagues from all over the country. LOGO programming is used as a tool for reflecting on and developing problem-solving and thinking processes.

A sub-theme of the institutes is "Young Women and Mathematics." Teachers have the opportunity to become more aware of the issues and problems that female students face in pursuing advanced math training and in entering math-related fields. Particular attention is paid to identifying teacher behaviors which contribute to or prevent/remediate "math anxiety."

Teachers, the past two summers, report that the program has rekindled their enthusiasm for teaching and increased their understanding of learning.

For information and applications, write or call Marty Simon, Director, SummerMath for Teachers, Mount Holyoke College, 302 Shattuck Hall, South Hadley, MA 01075, (413)538-2608.

OPERATION S.M.A.R.T.

contact person: Velma M. Dean, Computer Education Coordinator,
Turner Falls High School, Montague, MA 01351

Operation S.M.A.R.T.--Science, Math and Relevant Technology--is a new project of the Girls Club of America, Inc. Its purposes are to develop, establish and disseminate programs of informal science and mathematics education; and to design and distribute materials and curricula useful in both school and out-of-school settings. These programs and materials will be addressed especially to the needs of girls, whose participation in the fields of math, science, computers and technology has been limited, in school and in the workplace. Operation S.M.A.R.T. will serve girls age 6-18.

The goals of Operation S.M.A.R.T. are:

- * to design models and establish programs of informal science and mathematics education for girls;
- * to develop instructional and program materials for science, math and computer activities responsive to the special needs of girls;
- * to build linkages with schools and teachers, and to explore how these materials and activities can be adapted for use in the schools;
- * to distribute these materials to the 220 affiliate Girls Clubs throughout the United States, to the fourteen member organizations of the National Collaboration for Youth, to other out-of-school and after-school settings, as well as to teachers and public schools;
- * to encourage and support local initiatives by affiliate Girls Clubs to establish programs in math, science, computers and technology; and
- * to involve organizations and individuals from the private, voluntary and public sectors and from the professional and academic communities in the development, evaluation and dissemination of these materials, programs and models.

A proposal being made to the National Science Foundation focuses on eleven to fourteen year olds, and on the middle school and junior high school years.

Another grant proposal concerns a project for girls aged 6-11. The project is addressed especially to girls from low-income backgrounds who, whether disabled, from minority groups, or white, are often victims of "double discrimination." The project aims to enable Girls Clubs and other voluntary, non-school organizations to offer programs in math, science and computers for girls aged 6-11; to demonstrate how math and science concepts can be integrated into all program areas and activities; and to provide low-income girls with access to resources in the community which can further their interest and skills in math, science and computers.

Five Girls Clubs in the Northeast Region (Greenfield, MA; Pittsfield, MA; Lynn, MA; Schenectady, NY; and Syracuse, NY) have formed a collaborative relationship to develop model programs in each of their locations. Programs will have academic, reflective, and advocacy components, raising awareness among the girls and the communities while providing cognitive, social, and skill development. The math and science concepts that present themselves in everyday life will be identified and emphasized throughout all Girls Clubs activities. Linking with and learning how to use community resources will be an important thrust for both project staff and the girls themselves.

The project will document the process of establishing these programs, and produce guidelines advising others about the tasks, processes, and costs involved. Materials that include activities, handouts, worksheets, and the guidelines will be disseminated to at least 1000 organizations that serve youth and girls.

The Girls Club of America project will contribute to the field of program development in math, science and computers for elementary school-aged girls, especially in non-school settings, and offer effective methods for starting programs. It will raise awareness among the local communities and the educational and political establishments about the need for and existence of such programs. Girls in the program will gain skills, discover how these skills are relevant to their futures, and learn to be advocates on their own and other girls' behalf to draw attention and resources to math, science and computer education for girls.

The application is being made in response to the Secretary's request for projects that are designed to remove or reduce persistent barriers confronting women in achieving educational equity.

AWM COMMITTEES

The AWM Nominating Committee members are Audrey Terras, Jill Mesirov and Linda Ness. The Noether Lecture Committee members are Tilla Milnor (chair), Audrey Terras and Jean Taylor.

FATE OR FICTION: BIOLOGICAL THEORIES OF HUMAN BEHAVIOR

press release

Do our genes control our destiny?
Are sex roles, math and science abilities and IQ determined by biological inheritance?
Are there biologically inferior and superior races?
Do your genes determine if you are rich or poor?

Biological theories of human behavior have received widespread publicity within the scientific, educational and general communities since the publication of Edward Wilson's book *Sociobiology* in 1975. These theories have been introduced into high school and college classes through a number of articles written for the popular press and by films featuring the work of scientists who share Wilson's views.

Fate or Fiction: Biological Theories of Human Behavior, a slide-tape show produced by Science for the People, is the first audio-visual material available for high school and college classroom use that offers a critique of biological determinism. Science for the People has been in the forefront of groups within the scientific community that seek to heighten student awareness about the implications of such theories.

I want to celebrate the debut of *Fate of Fiction: Biological Theories of Human Behavior* - a moving, articulate and well researched presentation that squarely confronts biological determinist theories and the prejudices and biases that support them. An outstanding resource!

-Stephen Jay Gould, professor of geology, Harvard University, author of *Mismeasure of Man*

The recent release of the slide-tape show *Fate or Fiction: Biological Theories of Human Behavior* is designed to provide students with the critical consciousness necessary for developing alternative ways of thinking about the controversies surrounding biological determinist theories. The half-hour show is a thought-provoking introduction to issues of genetics, biology and human behavior. Using the slide-tape show in her high school social studies classes in North Reading, Massachusetts, Mary Ann Woolf comments:

This slide show uses humor and vivid illustrations in a way that increases students' interest in nature/nurture controversies while it helps them to understand the arguments advanced by critics of biological determinism.

By stimulating active class discussions, the show encourages students to examine their own biases and the role of science in encouraging or dispelling prejudice.

Fate or Fiction: Biological Theories of Human Behavior includes a history of biological determinist ideas, focusing on the misuses of science to promote social inequalities. It also analyzes recent controversies over girls, boys and math ability and the inheritance of IQ. The scientific background of these controversies is explained in clearly understandable terms.

An introduction to and a convincing presentation of the need for a critical approach to science and its claims of objectivity. Especially important is its examination of the case that scientists make for the biological basis of sex differences and women's social position.

-Ruth Bleier, M.D., neuranatomist and women's studies scholar, University of Wisconsin, author of *Science and Gender*

Fate or Fiction: Biological Theories of Human Behavior is available from Science for the People, 897 Main Street, Cambridge, MA 02139, (617)547-0370 for a rental fee of \$35.00 and is for sale for \$150.00. The 220 frame slide-tape

presentation comes with a synchronized sound track for manual and automatic showing. A script and a discussion guide featuring background material, a bibliography, and suggestions for discussion are included with each order.

"Biology as Destiny: Scientific Fact or Social Bias?", a collection of eight informative articles on the relationship of science to social issues, is also available from Science for the People for \$4.00 each (1 to 8 copies), \$3.50 each (10 to 17 copies), and \$3.00 each (20 or more copies).

IN THE PIPELINE: A COMPARATIVE ANALYSIS OF MEN AND WOMEN IN GRADUATE PROGRAMS IN SCIENCE, ENGINEERING AND MEDICINE AT STANFORD UNIVERSITY

by Laraine T. Zappert, Ph.D., Clinical Instructor of Psychiatry, Department of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, Stanford, California, and Clinical Psychologist, Cowell Student Health Services, Stanford University, and Kendyll Stansbury, Ph.D. candidate, School of Education, Stanford University

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Some free copies (funded by a grant) are available from the Center for Research on Women, Serra House, Stanford, CA 94305. When these are gone, copies will be available for about \$3.25.

The authors wish to thank several people for their assistance: Katherine Tobin, especially for help in designing the questionnaires, and in supervising the data collection and coding; the members of our Advisory Board and our ad hoc Graduate Student Committee for their valuable time, effort and suggestions. We also thank our academic sponsors: the Center for Research on Women (who also housed the project), the Office of Graduate Studies and Research, and Cowell Student Health Center; the Dorosin family, for the initial contribution; and our corporate sponsors: Getty Oil, I.B.M., Josiah Macy, Jr. Foundation, Pacific Telesis Group and Raychem Corporation. Finally, this research could not have been conducted without the commitment of Dean Jean Fetter who championed this project from inception to completion.

ABSTRACT

While studies have shown that increasing numbers of women are entering academic programs in science, engineering and medicine, the relative number of women awarded higher degrees in these areas is far below that of men.

The results of this research indicate that the women and men in science, engineering and medicine surveyed at Stanford University do not differ significantly in the factors affecting their decisions to remain in graduate programs in science, engineering, and medicine. Women and men do, however, differ in the perceptions of their preparations for graduate study. Additionally, significant differences exist in the pressures and roadblocks women and men experience during their graduate careers and the strategies they adopt for coping with these stresses.

Introduction

Industries and universities face a serious shortage of graduates in science and engineering. According to a 1980 report from the National Science Foundation, women remain the largest pool of talent available for increasing the size and quality of the science and engineering labor force. While there are programs to enhance the preparation of women entering undergraduate programs in science and engineering, little is known about the factors that influence women's decisions to pursue advanced degrees in these areas. This study compares the career development of women and men in science, engineering and medicine at Stanford University. It

provides comparative data on the recruitment, retention, career paths and aspirations of men and women graduate students.

While recent studies have shown that increasing numbers of women are entering academic programs in science, engineering, and medicine, the relative number of women awarded higher degrees in these areas is still far below that of men (Vetter, 1981; Fischer and Peters, 1979; Baranger, 1976). In addition, once they have completed their training, women still lag behind men with respect to salaries, employment and advancement opportunities (Vetter, 1981). Several studies (Fischer and Peters, 1979; Ott and Reese, 1975; Task Force, 1974) cite potential causes for women's higher attrition rate, among them lack of role models, lack of familial and psychological support systems, isolation combined with high visibility, lack of mentoring by male faculty, etc. This research examines how men and women go about making the decision to enter a graduate program in science, engineering and medicine; what happens to them both academically and psychologically during the course of their studies; and how and why they decide to continue or discontinue with a Ph.D. degree.

Specifically, it examines the factors which men and women cite as being instrumental in their decision to enter science, engineering, and medicine; how each group evaluates the importance of these factors; the academic background men and women bring to their studies and their own perceptions of the adequacy of their preparation to enter an advanced degree program. It also looks at the impact of minority status on the academic progress and perceptions of women in science, engineering, and medicine, as well as the effects of recruitment strategies, advising processes, availability of mentors, isolation and interpersonal interaction, etc., on professional and personal development.

In addition, we examine the factors which enter into the decision to continue in a particular area of study through the Ph.D. degree: Do men and women differ in their aspirations with respect to a Ph.D.? Do they have differing perceptions of the utility of that degree: What are the costs involved for each group? How do career plans, options and life goals affect the decision: Do women limit their aspirations as a way of reducing possible dissonance between career and family demands? How do the demands of personal life, as well as external support systems, differentially affect men's and women's decisions to seek a Ph.D.?

Finally we examine the strategies men and women use to deal with the psychological demand of graduate studies and the consequences of the strategies chosen to each group.

Literature Review

In general, there is a paucity of research on women in scientific fields and engineering. With the exception of women in medicine, there is virtually no study of women in graduate or professional programs in mathematics and the sciences. Therefore, our review of the literature was extended to include research on both undergraduate and practicing scientists, physicians and engineers.

Women in engineering (Ott, 1978; Britcher, 1980) and medicine (Kutner and Brogan, 1980; Burkett and Kurz, 1981) choose their career at a later age than men. The family backgrounds of women in engineering and medicine are slightly more advantaged than those of men in the same field. Women's parents are more highly educated (Ott, 1978; Kutner and Brogan, 1980; Greenfield et al., 1982) and have higher incomes (Auster, 1984) than men's parents.

The average female undergraduate engineer enters college with a higher grade point average and class rank than the average male (Ott, 1978; Jagacinski and LeBold, 1981). A comparison of men and women engineering students found women to have consistently higher (though not always significantly higher) grade point averages than men (Jagacinski and LeBold, 1981). Women medical students also tended to have higher undergraduate grade point averages than men (Fruen et al., 1974; Harward et al., 1981). Performances on the MCAT are similar, with the only occasional significant difference being women's higher score on the verbal subtest (Lopate, 1968; Fruen et al., 1974; Harward et al., 1981).

Little comparative research has been done on graduate school experiences of males and females in science and engineering programs (excluding medical school). In one of the few studies (Rose et al., 1979), only a small percentage of the graduate women surveyed (which included women in the social sciences) reported experiencing discriminatory acts. The majority of both women and men felt that there was little financial incentive to pursue a doctoral degree, so they were satisfied with a master's program.

While Ott (1978) found freshmen women engineers more likely than men to participate in professional organizations, a sample of graduates (LeBold et al., 1983) found men more likely to engage in a variety of professional activities, including reading or purchasing new engineering books, attending national meetings, presenting papers and publishing research articles.

A larger number of men than women engineering undergraduates considered administrative responsibility a very important work requirement (Ott, 1978). Engineering graduates did not differ in degree of technical responsibility of their first job (Jagacinski and LeBold, 1981), but a higher percentage of male than female graduates had managerial responsibilities after five years experience (LeBold et al., 1983).

In terms of valuing different aspects of jobs (Jagacinski and LeBold, 1981) there were no significant gender differences in rating the importance of adequate income, opportunity to be innovative, leadership and management opportunities, significantly contributing to society or enhancement of one's own status and prestige. Both freshmen women engineers (Ott, 1978) and graduate women in the sciences (Rose et al., 1979) were more interested in research than teaching.

Flexible working hours were also more important to women than men engineers (Jagacinski and LeBold, 1981). Medical students also reflect these differences. More women than men are interested in salaried practice where hours are generally fixed, and more men than women are interested in solo or partnership practice where hours are unpredictable (Mantovani et al., 1976; Davidson, 1979; Cuca, 1979; Burkett and Kurz, 1981; Kutner and Brogan, 1981).

Men in both engineering and medicine are more positive in their self perceptions (Roos et al., 1977; Ott, 1978; Jagacinski and LeBold, 1981) with women rating their ability lower than that of their male colleagues (Ott, 1978; Jagacinski and LeBold, 1981). When men and women freshmen engineers compared their anticipated academic performance to both same sex and opposite sex colleagues, the pattern of responses suggested that both sexes anticipated that men would outperform women. This was paradoxical, since the average female student had both a higher grade point average and higher class rank from high school than the average male (Ott, 1978). In addition, another long-term study found that the average woman engineer consistently had a higher undergraduate grade point average than the average man (though differences were not always significant--Jagacinski and LeBold, 1981).

In investigating the importance of a critical mass of women, Lantz et al. (1979) found no direct relationship between the percent of women students in an engineering school and the extent of institutional support, feelings of social isolation and grades of women students. They did find correlations between low percentages of women and absence of a peer confidant (of either sex; confidants were men as often as they were women), feeling socially isolated, and eventually dropping out.

The only research on physical and mental health comes from medical students. Although men and women did not differ in psychological symptoms upon entrance to medical school, by the middle of the first year, women but not men showed increased depression, anxiety and interpersonal sensitivity. By the end of the first year, women showed more somatic symptoms and slightly greater depression than men. For both men and women, role conflict and role support were related to the psychological symptoms. Women's greater psychological problems reflected their greater role conflict and lack of support (Lloyd and Gartrell, 1981).

Women medical students seem to have more personal/social problems than men (Heins and Thomas, 1979; Hoferek and Sarnowski, 1981). Though more women had

problems, Heins and Thomas found that women were more likely than men to be able to resolve or understand their problems sufficiently to function throughout medical school.

THE STANFORD SURVEY

Sample

A questionnaire was sent to all women and an equal number of randomly selected men graduate students in the fields of science, engineering and medical sciences (including the M.D. program) at Stanford University. Foreign students were not included in the sample population. In total, 1172 questionnaires were sent out. A follow-up postcard was mailed to everyone in the sample population two weeks after the original questionnaire was mailed out.

Three hundred twenty-eight (328) women and 299 men responded to the survey, for a total of 627 respondents, or a 54% response rate. There were 43 additional respondents from the department of physical therapy. In reviewing the data, however, it became clear that these respondents differed substantially in test scores and educational background from the other science, engineering and medical students, and it was decided not to include these students in this phase of the analysis. The distribution of the sample by department and degree programs is shown in Table I.

TABLE I

Sample Distribution by Department and Degree Program

Department	Men		Women	
	N	%	N	%
M.D. Program	35	11.7	56	17.1
Engineering & Physical Science	184	61.5	181	55.2
Math Sciences	29	9.7	30	9.1
Biological & Medical Science (Including M.D./Ph.D. students)	51	17.1	61	18.6
	<u>299</u>		<u>328</u>	
Degree Program				
M.S.	88	29.0	113	33.9
M.D.	35	11.6	56	16.8
Ph.D.	146	48.2	149	43.7
M.D./Ph.D.	22	7.3	9	2.7
Engineering	8	2.6	0	0.0
Other	2	1.0	5	1.5
	<u>301</u>		<u>332</u>	

The totals for respondents differ because of missing responses to the questions about department and degree program.

Instrument

The questionnaire used in this study was designed to provide information on: demographic characteristics, undergraduate education, family and occupational

background, graduate school experience, personal and professional socialization, career goals and interests, coping style and health status.

Using factor analysis, the following indices were developed to measure different aspects of the areas described above:

I. Graduate Work Indices:

Work Stress: the amount of pressure and conflict students experienced as a consequence of the demands of their graduate work.

Social Relations: the accessibility of other students and faculty and the general ambience of the work environment.

Advisor Relations: the student's relationship with his/her advisor.

II. Career Indices:

Impact: the importance of efficacy and self expression on career choice.

Creativity: the importance of being creative and challenged by a career choice.

Status: the importance of managerial responsibilities, income and social recognition on a potential career choice.

Security: the importance of job security and availability of position on career choice.

Work Pressure: the importance of flexibility and job pressures on career choice.

III. Coping Style Indices:

Efficacy: items related to personal expectations and pressures.

Self-Confidence: a person's assessment of his/her abilities and self-esteem.

Assertiveness: a person's ability to set limits and get their needs met.

Social Support: the adequacy of a person's support network.

IV. Health Status Index:

Health Status Index: items related to mood, affect, well-being and the stress of graduate school.

RESULTS

Demographic Characteristics

The men and women in the sample population tended to be very similar in demographic characteristics. The mean age for each group was 26 years; both groups were predominantly single (73%), without children (94%) and Caucasian (87%). Almost all of the men and women (97%) had attended coed undergraduate institutions. Thirty-five percent of their fathers had professional degrees or Ph.D.'s, as did 10% of the mothers. Over half the mothers of both the men and women had been employed outside the home at some point during the respondent's childhood.

TABLE II

Mean Graduate Record Exam Scores

	Overall	Math***	Verbal*	Analytical	MCAT
Men	1384	749	643	693	11
Women	1357	708	667	703	11

*Indicates significance at 0.05

***Indicates significance at 0.001

There were no differences between the men and women with respect to their undergraduate grade point averages; both reported a grade point average of approximately 3.58. There were also no significant differences between men and

women in their overall (Math + Verbal) scores on the Graduate Record Exam (GRE). As shown in Table II, however, while both the men and women scored on average over 700 on the Math section, men scored higher than women ($p < .001$). Women scored higher than men on the Verbal section ($p < .05$) and higher, but not significantly so, on the Analytical section. There were no significant differences between the men and women medical students on the Medical College Admission Test (MCAT). Similarly, there was no difference between men and women in the average number of undergraduate honors.

Academic Preparation

No significant sex differences were observed in the respondent's perception of his or her ability or interest in high school math and science. When asked about their ability and interest in college math and science, however, as shown in Table III, men more often than women rated as excellent their ability in college math ($p < .001$) and science ($p < .001$) and their interest in college math ($p < .01$). No significant sex differences were observed in interest in college sciences. Significantly more men than women reported having had excellent academic preparation prior to entering graduate school ($p < .01$).

TABLE III

	% Reporting Excellent	
	Men	Women
Ability in high school:		
Math	71	70
Science	72	71
Interest in high school:		
Math	52	51
Science	65	60
Ability in college:		
Math***	54	36
Science**	63	50
Interest in college:		
Math**	40	28
Science	69	64
Adequacy of academic preparation**	48	35

**Indicates significance at 0.01

***Indicates significance at 0.001

Socialization

The respondents were asked a series of questions related to the people who were influential and supportive in their choice of fields for graduate study. No significant sex differences were found in the extent of support men and women reported that they received from their fathers, mothers, spouses/partners, children, friends, and teachers. Both men and women reported these persons were supportive of their decision to study science, engineering or medicine. Forty-six percent (46%) of the women compared to 29% of the men reported that same sex friends were very supportive of their choices of graduate study ($p < .001$).

Significant sex differences were found in the type of influence fathers, spouses, teachers and bosses had on the men and women in our sample. Significantly more men (78%) than women (63%) reported that their fathers had a positive or very positive influence on their graduate career choice ($p < .001$). Mothers exerted a

similar positive influence on both men and women. Significantly more women (52%) than men (24%) reported that their spouses had a very positive influence on their field choice ($p < .01$). Female high school and college teachers were reported to have had a very positive influence on women students significantly more often than on men ($p < .01$). Similarly, both male and female bosses were reported as having a very positive influence on women significantly more often than on men ($p < .01$).

Graduate School

In many aspects of their graduate school experience, the men and women of our sample were very similar. No significant sex differences were observed in the number of fellowships they received, nor in how their graduate studies were financed. Both men and women most often financed their graduate studies with research assistantships and/or fellowships.

Most men and women had no plans to change their degree programs, fields of study, advisors or university. Neither were most of them anticipating leaving graduate school, nor seeking additional degrees. While the majority of men and women reported being satisfied with their graduate programs, there was a significant sex difference in the percent of men (82%) and the percent of women (73%) who reported being satisfied with their programs ($p < .05$).

In their academic work, significantly more men (72%) than women (61%) reported that they felt they were progressing as well as other students ($p < .05$). The grade point average for men (3.57) was slightly higher than that of women (3.50) ($p < .05$). More women (20%) than men (6%) reported never having had major responsibilities within their research group ($p < .001$).

As shown in Table IV on indices of Graduate Work Stress, Social Relations and Advisor Relations, the men and women in our sample did not significantly differ. In the area of Graduate Work Pressure, both men and women felt the impact of their work on their social lives, and were sometimes distressed by the volume of work required. Personal and financial concerns, however, did not often appear to have an important impact on their work.

On the Social Relations Index, Table IV, most of the men and women reported that faculty and other students were accessible to them and that generally good relations prevailed within departments and research groups. Approval of peers was more important to women than to men ($p < .05$).

While overall both men and women reported positive relations with their advisor, as measured in the Advisor Relations Index, women less frequently than men reported that they felt free to disagree with their advisors ($p < .05$), that they knew what their advisors thought of them ($p < .01$) and that their ideas were respected by their advisor ($p < .05$).

Women also differed from men in the extent to which they were affected by the sex of their advisor. Thirteen percent (13%) of the women reported that the sex of their advisor had a negative impact on them, compared to only 1% of the men ($p < .001$). Similarly, more women (18%) than men (10%) reported that the sex ratio of their research group affected them negatively ($p < .05$). More women than men also reported having had a male (20%) or female (40%) mentor in graduate school ($p < .05$). Eight-four percent (84%) of the women compared with 68% of the men agreed that a mentor would be helpful in graduate school ($p < .001$).

While neither men nor women reported high incidences of sexual harassment, significantly more women (40%) than men (30%) reported having had some negative experience with faculty members ($p < .05$). Twenty percent (20%) of the women compared to 7% of the men reported having experienced some form of discrimination at Stanford ($p < .001$).

Professional Interest and Activity

The respondents were asked a series of questions related to their degree of interest and involvement in their field of study. No significant sex differences were observed in membership or activity within professional organizations,

attendance at professional meetings, or in departmental support for attending professional meetings. Both men and women reported encouragement from their departments to present papers; however, neither group reported doing so frequently. When asked how often they published research, however, significantly more men (14%) than women (5%) reported they had done so "often" ($p < .01$).

More men (51%) than women (24%) reported reading in their field for leisure ($p < .01$), while more women (10%) than men (7%) were uncertain about their current level of interest in their field of study ($p < .01$). In assessing how hard they felt it would be to make it in their field, more men (35%) than women (24%) reported seeing little or no difficulty lying ahead ($p < .05$).

--To be continued next issue--

OREGON: FACULTY WOMEN FOR EQUITY

FWE: Margaret Lumpkin, President. 7565 N. W. Mt. View Dr., Corvallis, OR 97330
Claire Meyer, Treasurer. 741 E. 21st Avenue, Eugene, OR 97405

A class action suit, Penk v OSSHE, was filed in April, 1980 by university and college faculty women employed by the Oregon State Board of Higher Education. The trial began February, 1984 and concluded November 20, 1984. This case involves 22 plaintiffs and over 2200 women in the class. Although all faculty women share common responsibilities and discrimination, 1700 of these women were eventually forced to file a separate class action (Wallace v OSSHE) in October, as "non-teaching" faculty as a separate class. The Penk case has become the longest-running in the history of the Federal courts in the State of Oregon.

fact sheet from Faculty Women for Equity:

The Case: Penk v. Oregon State System of Higher Education
Filed April, 1980 as class action Title VII
October 1981 - certified as Class Action

Major Points: 2200 faculty women on the 8 campuses of the OSSHE claim
discrimination based on sex in pay, promotion, tenure and terms
of employment.
Damages for back pay is approximately \$6,000,000 per year or
\$39,000,000.
Trial began Feb. 8, 1984 and concluded Nov. 20, 1984.

Attorneys: Attorneys for Plaintiffs: Don Willner and Jo Anne Reynolds of
Willner, Bennett, Hartman & Tauman, P.C., Portland, OR.
Attorneys for Defendant: Jerry Casby and 3 other attorneys from the
Oregon Attorney General's office and the Firm of Morgan,
Lewis & Bockius of Philadelphia.

Proof: Statistical regression analysis and individual testimony involving
literally thousands of exhibits and over 250 witnesses.

Cost: Plaintiffs: The attorneys for the plaintiffs have taken the case on
a contingency basis.
Faculty Women for Equity has raised and spent more than \$150,000
and has borrowed \$15,000 from members and organizations.
Defendants: The Attorney General of the State of Oregon, in
violation of the Open Records law, refused to disclose how much
the state spent. A lawsuit for the disclosure of the out-of-state
attorneys was brought by two legislators, Grattan Kerans and
L.B. Day. Complying with a court order, state officials revealed
that the state has spent more than \$2,700,000.

Contributors: Contributions or loans have been received from a large percentage
of the class members and some organizations including the

following: American Association of University Women, National Education Association, American Association of University Professors, Women's Equity Action League, Oregon Education Association, Oregon Federation of Teachers, Oregon Nurses Association, Legal Association of Women, Oregon Public Employees Union, National Association of Affiliated Education Economists, Association for Women in Science, Women Composers, and National Women's Studies Association.

F.W.E.: An organization, Faculty Women for Equity, was formed in 1980 to pursue the case. This organization has the responsibility for fund raising activities and appeals, liaison with the media, providing volunteer workers for specific tasks, selecting and employing expert witnesses, and general oversight of the case.

The plaintiffs' final witness was Mary Gray, a statistician at American University in Washington, D.C. and a Past President of AWM.

from "Penk case testimony winds up," Statesman-Journal, Salem, Ore., Nov. 10, 1984, by Richard Hughes:

She had opened the case by testifying that women faculty members earned an average of \$2,300 per year less than men with similar qualifications and in comparable positions.

On Friday, she testified that several statistical studies developed by the plaintiffs pointed to the same conclusion about discrimination.

"There are negative effects in being a woman in salary, in rank and in tenure, and it's consistent across all institutions and all years," Gray said.

Gray said that was true even after the plaintiffs reworked their studies to overcome defense objections and to take into account Frye's ruling on the class size.

Along with being paid less, women are clustered at lower teaching ranks than men and are less likely to receive tenure, Gray said.

"No matter how you divided things up, the pattern remained constant," she said.

Gray questioned the validity of studies performed by the experts hired by the state. Those experts found no statistical indication of bias.

On February 15, 1985, U.S. District Court Judge Helen Frye ruled that there was no pattern of sex discrimination by the Oregon State Board of Higher Education.

from The Oregonian, Feb. 16, 1985:

The main points of the opinion are:

- * The 22 named plaintiffs prevailed on only three of 58 individual sex discrimination claims they filed.
- * The plaintiffs' evidence was insufficient to show a pattern of sex discrimination by the Oregon State Board of Higher Education.
- * The board offered non-discriminatory reasons for each action complained of by the plaintiffs.
- * In presenting individual cases, the plaintiffs' evidence was "entirely inadequate" in showing that the board's explanations were offered as a means of concealing its true purpose of sex discrimination.
- * The case in chief presented by each plaintiff was, for the most part, weak, and the rebuttal by each was, for the most part, non-existent.
- * The plaintiffs' statistical evidence was flawed.
- * The plaintiffs' theory failed because they do not prove that discrimination against women was commonplace at the colleges and universities. "No pattern or practice of sex discrimination exists of which the board should have been aware."

from "What's behind Oregon's landmark sex discrimination case," Willamette Week, Portland, Ore., Feb. 21-27, 1985, by Kay Durham

But in fact, anyone who took the trouble to attend the *Penk* trial, which lasted from Feb. 4 to Nov. 20 of last year with but two recesses, would have been forced to come to the conclusion that the state system is riddled with sex discrimination at the faculty and administrative levels. Witness after witness recounted for Judge Frye and those in attendance detail after detail of discriminatory practices and unfair working conditions at all eight state-run institutions of higher learning--Eastern Oregon State College in La Grande, Western Oregon State College in Monmouth, Southern Oregon State College in Ashland, the Oregon Institute of Technology in Klamath Falls, the University of Oregon in Eugene, Oregon State University in Corvallis, and Portland State University and the Oregon Health Sciences University here in Portland.

Anna Penk, the lead plaintiff, took the witness stand early in the trial, during the period of initial interest when Judge Frye's courtroom was regularly packed with press, women faculty and other interested observers. An associate professor of mathematics at Western Oregon State College, Penk spoke confidently and directly to Judge Frye as she recounted the unpleasant treatment to which she had been subjected in Monmouth since she began teaching there in 1973. Among other things, she told of being forced to share office space with secretarial staff while her male colleagues all had private offices. "The worst part about it," she said, was that when I counseled students, we had no privacy." ...

Then there was the testimony of Dr. Mary Ann Petry, who taught art at Western Oregon State College from 1977 until 1983, when she was terminated as part of a "reduction in force" procedure. Petry's testimony consisted largely of anecdotes about various sexist remarks made by male colleagues, and she spoke in particular of her encounters with a Dr. Mattingly, the coordinator of Western's art department. According to Petry, Mattingly refused to share his printmaking studio with any woman, while the men in the department were always welcome. And Petry said that when she once asked him if she could teach a printmaking course during summer term, his response was: "Over my dead body." ...

In order for the class to prevail, it had to demonstrate a "pattern or practice" of sexually discriminatory behavior on the part of the board. That, in turn, called for the Byzantine battle of numbers. The plaintiffs' failure to prevail with this part of their case did more than simply doom the class action aspect of the case. It also appears to have wrought havoc with the individual cases. That is, in each instance where sexually discriminatory actions were alleged and testified to by Penk, Petry, Leonard, and the 19 others, the board's witnesses offered explanations for their conduct that had nothing to do with gender. They cited budget problems, inadequate performance, simple misunderstandings, and the like.

It thus became the burden of plaintiffs to show that these explanations were pretexts created to explain away improper behavior. Had the plaintiffs' statistics held up, they would have served as compelling evidence that, whatever the explanations offered, the true underlying reason for the inequitable treatment was sex discrimination.

Once their statistical case had been shredded, however, the plaintiffs were left with little more than their word against the board's, and the board, in Frye's opinion, had responded with "a storm of explanation."

press release from FWE:

The faculty women in higher education read Judge Frye's verdict with deep dismay and frustration: dismay because the verdict changed none of the discriminatory practices that are occurring in higher education and frustration because discrimination will continue.

As Judge Frye so accurately states, "The tragedy of the case is that it has taken 5 years including 9 months of trial to resolve disputes which should have been resolved more rapidly and readily and with less cost in grievance procedures and administrative hearings."

The tragedy is compounded by the judge's decision, a decision which assures no change in inadequate personnel procedures and safeguards.

Faculty Women for Equity had one goal when we began this case after 10 years of study and appeals. That goal was to change the discriminatory policies and practices peculiar to higher education in Oregon. We wanted to offer some small compensation to those who have been discriminately underpaid for years, we wanted to equalize the salaries and status of those who are being discriminated against now and we wanted to ensure that women who chose higher education as a future career can earn the same rewards and recognition as their male colleagues.

As we assess the situation today, we recognize that we have made some small steps in accomplishing our goal. We have, with a great deal of media help, informed the citizens of Oregon that there are grave personnel problems for women in higher education. Our students as well as our male colleagues have been made aware of the unfavorable environment for women faculty. We have helped individual women faculty recognize that discriminatory treatment was widespread and shared by their female colleagues throughout the system. Even Judge Frye realized that a good grievance procedure and administrative hearings would have saved much of the trauma and expense of the lawsuit. We revealed the total inadequacy of the Affirmative Action officers and the system to deal with the personnel problems. And we proved that there were statistical patterns of disparate or different treatment--which we believe are due to discrimination.

On the other hand, we failed to convince one judge, after 25,000 pages of testimony and 250 witnesses that the disparate or different treatment which we have received is due to sex discrimination. We failed in our rebuttal of the individual cases because the judge limited us to 2 days to rebut over 100 witnesses. And we failed to make our statistical case understandable to the judge because, although she allowed the state to use all of their statistical experts, she refused to hear our 2 chief rebuttal experts, Dr. Kenneth Arrow, Nobel Prize winner in Economics and Dr. Ingram Olkin, President of the International Mathematics and Statistics Institute--both of whom were left sitting in the courtroom.

We agree with Judge Frye that we failed to prove an intentional discriminatory motive. We did not attempt to prove that there was intentional discrimination. We feel that we did prove that there was discrimination regardless of intent and that the Board was informed of various studies which indicate problems of sex discrimination, yet they took no corrective action.

We have failed to protect some of the women who testified. But because we have not been able to prove a pattern of discrimination to one judge, does not mean that there is no discrimination on the Oregon campuses.

The bottom line is that we have failed to accomplish our goal of changing the policies, practices and accountability procedures in employment in higher education in Oregon.

Faculty Women for Equity has voted unanimously to appeal Frye's decision.

SUNY REGISTRY

The State University of New York's Central Administration has established a special Affirmative Action registry for faculty and administrators interested in SUNY opportunities. These employment opportunities will be available because more than 600 SUNY faculty and other professional staff have elected to take advantage of early retirement options recently offered by New York State. Interested individuals may file their resumes with the State University Affirmative Action Office, which will send registrants information about appropriate campus openings. Registrants may then apply directly to individual campuses, which, in the SUNY system, do their own hiring.

Resumés should be sent to Dolores Barracano Schmidt, Executive Assistant to the Chancellor for Affirmative Action, State University of New York, Albany, NY 12246.

OF POSSIBLE INTEREST

Feminist Issues, a biannual journal of social and political theory. F.I., Transaction Periodicals Consortium, Rutgers-The State University, New Brunswick, NJ 08903.

Feminist Studies, a forum for feminist analysis, debate, and exchange. Published three times per year. FS, Women's Studies Program, University of Maryland, College Park, MD 20742.

Literary classics by women. The Feminist Press, Box 334, Old Westbury, NY 11568.

The Annual Meeting of the American Association for the Advancement of Science will feature a symposium on "Social Ethics, Agricultural Change, and Agricultural Research." The symposium is scheduled for Monday, May 27, 1985 in the Los Angeles Hilton Assembly Center. Symposium speakers will examine some of the controversies, the actors and the stakes in choices for agriculture and agricultural research, particularly in California. Participants include Molly Coye, Medical Officer for the National Institute of Occupational Safety and Health in San Francisco; William Friedland, Professor of Sociology, University of California-Santa Cruz; Theodore Hullar, Executive Vice Chancellor, University of California-Riverside; William Stiles, Agriculture Committee Staff Consultant, U.S. House of Representatives; Bill Harriott, Past President of the American Society of Agricultural Engineers; John Cobb, Professor, School of Theology at Claremont; William Aiken, Associate Professor of Philosophy, Chatham College; and William Lacy, Associate Professor of Sociology and Committee on Agricultural Research Policy, University of Kentucky. The symposium is being organized by Kenneth Dahlberg, Professor of Political Science, Western Michigan University, and Rachelle Hollander, Director, Ethics and Values in Science and Technology Program, National Science Foundation. For further information, write the EVIST Program, National Science Foundation, Washington, DC 20550 or telephone EVIST at 202-357-7552.

LATE BREAKING NEWS!!

RAYTHEON GRANT

For the third consecutive year the Raytheon Company of Lexington, MA has awarded \$5000 to AWM for support of a summer program in the Greater Boston Area. Grants of the last two summers were used for partial tuition for high school women mathematics teachers who took courses in PASCAL or Data Structures or other courses in computer science. As a result some of these teachers were able during the last two years to introduce the Advanced Placement (AP) PASCAL Program to the students in their computer science courses at their respective high schools.

The Fund Raising Committee urges AWM members in other parts of the country to try to arrange similar programs in their areas.

DEADLINES: May 24 for July-Aug., July 24 for Sept.-Oct., Sept. 24 for Nov.-Dec.
AD DEADLINES: June 5 for July-Aug., Aug. 5 for Sept.-Oct., Oct. 5 for Nov.-Dec.
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 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.

Trinity College. Dept of Engineering & Computer Science, Hartford, CT 06106.
Prof. Joseph D. Bronzino, Chmn. Tenure track position 9/1985. Initial appt. for 3 years. Duties: developing & teaching undergraduate computer science courses, fostering interdisciplinary activity related to computing, & conducting continuing research within computer science. Required: PhD in comp sci or closely allied field. Prefer specialty in compiler or operating system design. Salary & rank commensurate with experience. Send curriculum vitae & list of 3 references to Chmn.

Western Illinois University. Dept of Math, Macomb, IL 61455. Larry Morley, Chairperson (309) 298-1054. One or more tenure track asst or assoc professorships 8/26/85. Required: PhD in math sciences including math education. Strong ability or potential in teaching & commitment to continuing research expected. Some temporary positions are also expected subject to funding. Applications considered until positions are filled. Apply to Chairperson.

University of Iowa. Director of University Office of Information Technology. Appointee will provide intellectual & managerial leadership on a University-wide basis for implementation & maintenance of information technology on campus. Must exploit continuing technological changes. Specific duties include planning & coordinating development of the University's communication systems and primary responsibility for academic & administrative computing. Required: PhD & experience in computing or related field or equivalent combination of education & experience. Salary open. Screening of candidates will begin immediately. Please send resume & supporting materials to D. C. Spriestersback, Chair, Search Committee for Director of Information Technology, 201 Gilmore Hall, University of IA, Iowa City, IA 52242.

Rensselaer Polytechnic Inst. Dept of Math Sciences, Troy, NY 12180. R.P.I.'s Dept of Math Sciences is searching for Chairperson of Dept. Required: experience in both research in applied math & academic administration. Send vitae & names of 3 references to Prof. M. Slemrod at above address.

SUNY College at Cortland. Mathematics Dept., Cortland, NY 13045. Thomas M. O'Loughlin, Chmn. Tenure track position for person to serve as participant in interdisciplinary program in computer applications & to teach computer science courses. Duties include teaching of large lecture section of an introductory course in computer applications for non-majors. Required: Master's Degree in comp science & teaching experience. Will begin to consider applications on 5/15/85 & will accept applications until position is filled. Send vita & 3 letters of recommendation to Chmn.

George Mason University. Dept of Math Sciences, 4400 Univ. Dr., Fairfax, VA 22030. Dr. Stephen Saperstone, Acting Chmn. Tenure track asst professorship(s) 9/1/85. Required: PhD in math discipline, strong research potential & teaching ability. Will consider candidates in both areas of pure and applied math. Send vita & have 3 letters of recommendation sent to Math Search Committee.

ASSOCIATION FOR WOMEN IN MATHEMATICS
MEMBERSHIP APPLICATION

The AWM membership year is October 1 to
October 1.

Name and Address _____

New _____ Renewal _____
Individual \$15.00 _____
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*Sponsoring, Category I: \$65 _____
*Sponsoring, Category II: \$45 _____
Regular: \$25 _____

ASSOCIATION FOR WOMEN IN MATHEMATICS

and mail to: Association for Women in
Mathematics
Box 178, Wellesley College
Wellesley, MA 02181

*For information on the additional privileges of
these categories of Institutional Membership,
please write to the AWM Office.

Contributing Member \$20 or more in addition
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Please return this completed form to AWM Office at address above.

AWM Speakers' Bureau Registration

The Speakers' Bureau has proved to be one of the best ways to improve the visibility of women in mathematics. We hope that you wish to join the Bureau. To be included, you need only complete the following form and return it to the AWM office.

Speaker:

Position/Address:

Home telephone:

Business telephone:

Dept # & your office # if different

Degrees:

Field:

Additional Qualifications (e.g., special skills, non-academic experience):

Topics for talks, with suggested audience level:

Code:	Gr	Graduate/colloquium level	E	Elementary school
	C	College (L-lower division; U-upper division)	Ed	Educators & Education majors
	HS	High school	Gen	General audience (P.T.A., etc.)
	JHS	Junior high school	F	Flexible (tailored to fit audience)

Abstract(s) for talk(s) for precollege students:

(Use reverse side if needed.)

Linda Keen, *President*
Herbert H. Lehman College (CUNY)
Bronx, NY 10468

Lynnell E. Stern, *Treasurer*
Wang Laboratories, Inc.
Lowell, MA 01851

Anne Leggett, *Editor, Newsletter*
Loyola University
Chicago, IL 60626

