

ASSOCIATION FOR WOMEN IN MATHEMATICS
NEWSLETTER

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Summer, 1976

REPORT FROM THE PRESIDENT

AWM Schedule of Events at the Summer Joint Mathematics Meetings, University of Toronto, August, 1976:

AWM open executive committee meeting: Wednesday, August 25, 5:30 - 6:30 p.m., 2129 Sidney Smith Hall (the mathematics building).

We will be discussing ways in which the AWM and the executive committee can be expanded to increase representation and scope. If you will be in Toronto, I hope you will come.

AWM panel, "History of women in mathematics": Thursday, August 26, 12:00 - 1:15 p.m., 2135 Sidney Smith Hall.

Moderator: Lenore Blum

- Speakers: Professor Lida K. Barrett, University of Tennessee: An Overview
- Professor Mary W. Gray, American University: Sophie Germain, A Bicentennial Perspective
- Professor Linda Keen, Graduate School and University Center, CUNY: Sonya Kovalevski
- Professor Emiliana Neother, University of Connecticut: Emmy Noether, 20th Century Mathematician and Women
- Professor Martha K. Smith, University of Texas, Austin: Emmy Noether, Her Work and Influence

AWM table: Monday - Friday, August 23 - 27, entrance lobby of Sidney Smith Hall.

The AWM table serves as the focal point for AWM activities at the meetings and is a good place for us to get together. It has also been an important place to distribute information about the AWM and recruit new members. If you're in Toronto, I would appreciate your help in staffing the table. Please check in when you get to the meetings - you can sign up at the table. And even if you can't help out, come by and say hello.

Other Events of Interest at the Toronto Meetings

"Geometrical Optics and the Singing of the Whales", Professor Cathleen Morawetz, Courant-NYU, MAA Invited Speaker; Thursday, August 26, 11:10 - noon, Convocation Hall.

"New Directions in Computability Theory", Professor Marian B. Pour-El, University of Minnesota, AMS Invited Speaker; Thursday, August 26, 5:15 - 6:15 p.m., Convocation Hall.

"Some Mathematical Applications of Logic:", Professor Martin Davis, Courant-NYU, MAA Hedrick Lecturer; Thursday, Friday, Saturday, August 26, 27, 28, 9:00 - 10:00 a.m., Convocation Hall. (The first two lectures will be on "Unsolvability Problems" and "Diophantine Sets" and will discuss some of Julia Robinson's work.)

IMPORTANT: AMS Council Meeting, Monday, August 23, 2 p.m.

The AMS Committee on Academic Freedom, Tenure, and Employment Security (CAFTES) is the only AMS committee mandated to investigate specific allegations of discrimination. Several such cases are now before the Council. However, there has been a move by one of the Council members to severely limit CAFTES' powers. A special committee report on this issue will be presented at

3 pages

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HOW JOHNS HOPKINS PROTECTED WOMEN FROM "THE ROUGHER INFLUENCES"

SUMMER, 1976
AUM NL

by Kathryn Jacob, Johns Hopkins University Archivist
(reprinted with permission of the author from the Johns Hopkins Magazine)

Getting a PhD, if you were a woman, was difficult enough in the United States in the late 1800s. But at the otherwise enlightened Johns Hopkins University it was virtually impossible. Being admitted, although a feat in itself, was no guarantee of success; nor was completion of the requirements. In the case of Christine Ladd-Franklin, the first woman to earn the Hopkins PhD, the degree she earned was to be denied her for 44 years.

Elsewhere in the nation, Boston University became the first American university to award its PhD to a woman, in 1877. It was closely followed by Harvard, Yale, and Columbia. For after women had found access to solid academic training at such schools as Vassar, Smith, Wellesley, and a number of good coeducational institutions, the graduate schools found it increasingly hard to deny their ability, or admissibility. Johns Hopkins was one of the last holdouts.

The "women's problem" had beset the Hopkins trustees from the university's founding. President Charles Eliot of Harvard advised them that coeducation in undergraduate departments was "a thoroughly wrong idea which is rapidly disappearing." James Angell of the University of Michigan, however, which had been coeducational since 1871, assured them that the presence of women had cause no "embarrassment" there.

The issue was unresolved in February of 1876 when Daniel Coit Gilman gave his inaugural address. In it, he cautiously expressed his support for co-ordinate education and his hope that a philanthropist would step forward to establish such an institution in Baltimore. Such a plan was, he said, superior to coeducation because it would not "expose young women to the rougher influences found in colleges and universities where young men resort."

In November of 1876, trustee James Thomas called a special meeting of the board to discuss his plan for "imparting, to a well guarded extent, the benefit of the teachings of the university to females, as well as males, suitably prepared by age and acquirements to profit by such teachings." No doubt the images of his own daughter Carey, then a senior at Cornell, and those of her bright young friends, including the daughters of trustees Garrett, Gwinn and King, stood before Dr. Thomas as he made his plea. While King and Garrett supported Thomas, Gwinn remained solidly opposed, and there the matter rested throughout the first academic year.

The following year, the women's question was once again very much alive as not one but two women pressed for admission to the graduate school. Of the 16 public school teachers who had enrolled in the university's Saturday classes in biology, 11 were women. One was a Miss Emily Nunn who had studied at Cambridge and planned to teach at Wellesley. Miss Nunn proved to be an outstanding student and her professor, apparently misunderstanding the trustees' feelings, admitted her to his regular graduate classes. The trustees were furious. Gilman ordered her dismissed. Seeking to justify his actions, Gilman wrote to Miss Nunn's defender, Henry Durant, the founder of Wellesley: "I should be sorry to have this institution be discourteous to anyone seek-

ing knowledge but the Biological Laboratory where experiments in respect to animal life are in progress is not well adapted to the coeducation of young men and young women."

Miss Nunn departed peacefully but the second challenger would not be so easily put off. Armed with her Cornell degree, Carey Thomas applied for admission to the Greek seminary. She was well qualified. She was also the daughter of one influential trustee, niece of another, and personal friend of several others. In September of 1877 she was accepted as a candidate for a master's degree.

Carey hadn't realized that the phrase "without class attendance" on her admission form excluded her from all classroom lectures. Basil Gildersleeve's patient tutoring was no substitute for the stimulating seminar discussion. According to legend, Gildersleeve, seeing her disappointment, arranged for Carey to sit behind a screen and overhear the deliberations of the learned group.

When informed that, despite excellent grades on her examinations, she would be excluded from the classroom for a second year, Carey Thomas wrote the trustees an angry letter of withdrawal "rejecting the crumbs." She went on to earn a PhD in Germany, and in her later career as president of Bryn Mawr College, she was to open many new doors for women.

Having rid themselves of Miss Nunn and Miss Thomas, and trustees had peace until 1880 when a Miss Atkinson applied for admission to the undergraduate school. Again the trustees refused admission and reaffirmed their opposition.

Ironically, while this brouhaha over coeducation raged among the trustees, one young woman was already quietly studying at the university, in the mathematics department. The situation arose when the university first announced its fellowship program in 1876, and one of the first applications to arrive was one signed "C. Ladd." The credentials accompanying the application indicated such outstanding ability that a fellowship in mathematics was awarded to the applicant, sight unseen, and was accepted.

When it was discovered that the "C." stood for Christine, several embarrassed trustees charged she had used trickery to gain admission, and the board immediately moved to revoke the grant. They failed to reckon, however, with the irascible Professor James J. Sylvester, stellar member of the first faculty. In 1870 Sylvester had been named the world's greatest living mathematician by the Encyclopedia Britannica, and his presence at Hopkins was a real coup for the fledgling university. He was indispensable and knew it, in an ideal position to insist on virtually anything he wanted; in this case, he had read Christine Ladd's articles in English mathematical journals, and he insisted upon receiving the obviously gifted young woman as his student.

Miss Ladd was admitted as a full-time graduate student in the fall of 1878. Though she held a fellowship for three years, the trustees forbade that her name be printed in circulars with those of other fellows, for fear of setting a precedent. Dissension over her continued presence caused one of the original trustees to resign.

Born in Connecticut in 1857, Christine Ladd was one of the first young women to attend Vassar College, where she received her AB in 1869. At Vassar, she became interested in physics, especially pendulum vibration. However, finding it difficult to pursue such research outside of laboratories, and that her gender barred her from laboratories, she switched her interest to mathematics.

Once at Hopkins, she gravitated to the lectures of Charles Sanders Peirce and his theories of symbolic logic. Working closely with Pierce, she invented a technique for reducing all syllogisms to one formula, the antilogism, of which she gave this simple example: "Emily is at the dinner table and tries to eat her soup with a fork. Her mother says 'Nobody eats soup with a fork.' To which Emily replies: 'But I do and I am somebody.'"

The important of her antilogism theory was noted by philosopher Josiah Royce, another early Hopkins fellow: "It is rather remarkable that the crowning activity in a field worked over since the days of Aristotle should be the achievement of an American women."

Although Miss Ladd proved herself worth her fellowship, she also confirmed the trustees' apprehension about romance. After studying with him for four years, Miss Ladd married Associate Professor Fabian Franklin, adding his name to her own. Though she continued to pursue an outstanding career, repudiating charges that higher education is wasted on women who marry, the trustees nevertheless held up the case of Christine Ladd-Franklin to justify their continuing opposition to coeducation.

In 1882, Christine submitted her dissertation, which was entitled "The Algebra of Logic." It was accepted. Moreover, said Pierce, it was brilliant. All the requirements for the PhD

had been fulfilled. The trustees, however, refused to grant her the degree, again citing their reluctance to set a precedent.

Not surprisingly, the Franklins left Hopkins soon thereafter and went to Gottingen to study. As had Carey Thomas, Christine found that, thanks to Bismarck, the German universities were officially closed to women. However, one distinguished professor was so impressed by her work that he repeated his lectures to her privately and let her work in his personal laboratory. Out of this period in Germany came her pioneering work in color vision, known as the Ladd-Franklin theory.

By 1904, the Franklins had returned to Baltimore: Fabian as editor of the Baltimore News and Christine - still without her degree - as lecturer in logic and psychology at Hopkins. The trustees still remained adamant. It was not until 1907 that they were to finally relent and cautiously resolve "That women who have taken the baccalaureate degree at institutions in good standing be admitted to graduate courses in this University provided there is not objection on the part of the instructor concerned."

As the only woman on the faculty at Hopkins, Christine Ladd-Franklin was something of an embarrassment. In 1909, when more hospitable Columbia University invited her to join its faculty she accepted. There, she continued to encourage her female students to pursue graduate and post-graduate work. She was proud of being a pioneer in gaining university education for women and was keenly interested in seeing scientific papers by women published in scholarly journals. Her zeal must have been contagious; her daughter, Margaret Franklin, also a feminist, was the author of *The Case for Woman Suffrage*, a cogent argument for a cause her mother found "logical."

In 1926, only four years before her death at age 82, Hopkins invited Christine Ladd-Franklin to return and receive her long-denied PhD. She had waited over four decades to receive the following news from President Goodnow: "It gives me great pleasure to inform you that at the last meeting of the board of trustees, I was authorized to confer upon you the degree of Doctor of Philosophy of this university, in recognition of the work done by you while in residence as a graduate student and fellow. At that time, as you know, it was the policy of the Institution not to give degrees to women. Since then we have seen the light and no doubt the distinguished service which you have rendered to the advancement of knowledge since your residence among us has aided in bringing about this change in policy."

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BOYS AND GIRLS TOGETHER?

by Judy Roitman

The National Assessment of Educational Progress (NAEP) of the AAAS has completed reports on the comparative educational achievements of boys and girls. These reports were summarized in the AAAS newsletters *Science Education News* and *Spotlight*. The headline in the former was "Males Dominate in Educational Success." Much of the study concentrates on mathematics.

On the other hand, a study by Fennema and Sherman of the University of Wisconsin, Madison, questions the presentation of data and the conclusions of the NAEP study of comparative mathematical achievements.

Needless to say, the way in which these studies will be accepted, digested, and used to set policy by such agencies as HEW and NSF will profoundly effect the future education of women in mathematics. The Fennema-Sherman study is available from them; the NAEP reports are available from the NAEP Publications Office, Suite 700, 1860 Lincoln Street, Denver, Colorado 80203.

Any public response you may wish to make to these reports should be sent to either of the AAAS newsletters mentioned, c/o Dr. Arthur H. Livermore, Office of Science Education, AAAS, 1776 Massachusetts Avenue NW, Washington, D.C. 20036.

We hope to publish excerpts from the Fennema-Sherman study in a future newsletter. Thanks to Truman Botts of the CBMS for bringing the NAEP reports and appropriate addresses to our attention.

Meanwhile there is the American College Testing Program's study showing that the widely publicized drop in College Entrance Examination scores in recent years is skewed, with the average women's score dropped more than twice as much as the average men's score. This information is clearly a two-edged sword capable of supporting discriminatory educational policy and attitudes. The Women's Equity Action League (WEAL) had taken the offensive, feeling that this drop reflects

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the fact that more women are entering college whose parents have lower incomes or less education than the parents of college women of previous generations; and that these new students endure more sexism in their educations. To quote WEAL spokesperson Arvonne Fraser: "Women have been economically disadvantaged by our school systems and educationally deprived. Perhaps all parents of daughters should get a tax refund."

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ACTION PROGRAMS DESIGNED to increase the interest and participation of women in math and science-related fields.

by Nancy Kreinberg, Lawrence Hall of Science

(ed. note: the following was written to supplement the forthcoming article in MS. on mathematical anxiety in women, written by Sheila Tobias of Wesleyan University. Too long for complete inclusion in MS., Nancy's article is printed here. If you know of any program that should be on this list, please let Nancy and us know.)

Pre-college programs encouraging young women's interest and competency in mathematics within an all-female environment.

Since Spring 1974, 300 girls, ages 6-14, have participated in "Math for Girls" classes at the Lawrence Hall of Science on the Berkeley campus of the University of California. Girls are provided with "hands-on" experiences in logical thinking and problem solving that stimulate their curiosity and interest in mathematics. Puzzles, games, and computer activities show a side of mathematics that can be as fun as it is challenging. The classes are taught by female students at the University who are selected and trained on the basis of their interest and ability in mathematics, and their desire to act as role models of women in mathematics for their students.

Contact: Nancy Kreinberg or Rita Liff, Lawrence Hall of Science, University of California, Berkeley, Calif. 94720.

At Johns Hopkins University, Professor Lynn H. Fox conducts an accelerated algebra program for seventh-grade girls who are mathematically gifted. The program is designed to improve the girls' competence and accelerate their progress in mathematics, and to increase their awareness of career opportunities in science and mathematics. The effect of the all-female environment, in which the social relevance of mathematics is emphasized, appears to be effective in raising the achievement level of these girls.

Contact: Lynn H. Fox, Assistant Professor of Education, Evening College and Summer Program, The Johns Hopkins University, Baltimore, Maryland 21218.

At Michigan Technological University, Professors Clyde E. Work and Martha E. Sloan conduct a program designed to inform eight-grade girls about engineering and to motivate them to schedule appropriate math and science courses in high school that would prepare them to keep engineering and physical science as career choices in college. Some students see films and hear lectures and presentations by women engineers, others participate in projects and give them a feel for engineering through direct experience with simple engineering problems and equipment, and a third group receives printed materials on engineering. The effectiveness of the different methods are being evaluated.

Contact: C.E. Work, Associate Dean, College of Engineering, Michigan Technological University, Houghton, Michigan 49931.

Pre-college conferences and seminars to create awareness among junior and senior high school women of the variety of math-related careers.

A series of conferences on the Mills College campus are being held for 7th through 12th-grade women who are interested in math, science, and technology. The one-day programs include panel discussions, math and science workshops that emphasize active participation and experimen-

tation, and small-group discussions with women scientists and technicians. Parent and teacher workshops provide information to help them assist their daughters and students in pursuing math and science interests.

Contact: Nancy Kreinberg, Lawrence Hall of Science, University of California, Berkeley, California 94720.

"Women in Engineering" was an all-day event for young women in middle schools, high schools, and community colleges in the Greater Seattle area. Small-group discussions included topics on the energy crisis, bioengineering, the women engineer, transportation, and the environment.

Contact: Thomas Stoebe, College of Engineering, University of Washington, Seattle, Washington.

The University of Southern California School of Engineering sponsored an Engineering seminar for outstanding high school girls in February, 1976. Students had an opportunity to hear and talk with a number of women engineers and engineering students. The seminar also included tours of USC's engineering laboratories and facilities.

Contact: Gail Sullivan, Chairperson, Society of Women Engineers, Olin Hall 200, University of Southern California, University Park, Los Angeles, Calif. 90007.

Seventy high school senior women attended workshops in Spring 1975 in 5 Kansas cities. During the one-day sessions, the women identified aspects of their own self concept which might inhibit their choice of a traditionally male career; worked in planning sessions to understand ways in which these inhibitions have affected their career choices; and were shown how they could use the University of Kansas' resources to pursue a traditionally male science career. At the same time, but in separate workshops, the parents were introduced to realistic career and life patterns for women and given an opportunity to explore new career aspirations for their daughters. Following the workshop, the women have participated in group activities intended to develop peer support.

Contact: Walter S. Smith, Associate Dean of Women, University of Kansas, Lawrence, Kansas 66045.

The Mathematical Association of America has established a new lectureship program, "Women and Mathematics," to encourage high school women to study mathematics and to prepare for careers in which math is used. The speakers' full-day visits are geared to a tenth-grade audience, and presentations range from formal lectures to informal discussion sessions with students, counselors, parents, and administrators. The speakers provide role models for high school girls in the academic, business, industrial, computer, social science, and natural science communities. Regional coordinators arrange visits.

Contact: Dr. Eileen L. Poiani, St. Peter's College, Jersey City, New Jersey 07306.

"Introduction to engineering program for high school girls" is a one-week residence program on the Madison campus of the University of Wisconsin. Included are presentations, "hands-on" workshops, and informal sessions with practicing women engineers.

Contact: Lois B. Greenfield, College of Engineering, Room 22, Building T-24, 1527 University Avenue, Madison, Wisconsin 53706.

Fifty high school women spent a week in residence on the College of Engineering campus, University of Oklahoma, in a project to acquaint them with an understanding of what they might do as practicing engineers. Women engineering students participated in recruitment, follow-up, and as project leaders.

Contact: R. Leon Leonard, School of Aerospace, Mechanical, and Nuclear Engineering, University of Oklahoma, Norman, Oklahoma 73069.

College courses and workshops to enable women students deficient in math skills to prepare for entry into further mathematics courses.

The "Women in Science" program at Mills College in Oakland, California, enables women within a liberal arts framework to take advantage of their new options in science and science related

veterinary, neuropsychology.

Contact: Donald D. Thompson, Department of Psychology, Mary Baldwin College, Staunton, Virginia 24401.

At the University of Michigan (Ann Arbor), the Michigan Women in Science sponsor about 15 women speakers a year in various science departments. The Center for Continuing Education of Women also provides a math tutorial series designed for women who have been out of school for several years, and wish to take the Graduate Record Exam or LSAT (law exam). The tutorial consists of a few nights of free tutoring in the basic math that would appear on the quantitative part of these exams.

Contact: Evelyn Boorman, Michigan Women in Science, Math Department, University of Michigan, Ann Arbor, Michigan.

A conference was held on the Mills College campus in Spring 1976 that brought together women scientists and educators from the greater San Francisco Bay area. Sponsored by the Center for Teaching and Learning at Stanford University, the full-day program included a keynote speech by Estelle Ramey, and workshops in topics such as minority women in science, attrition of women in the sciences, career re-entry and upgrading of skills, and jobs for women in science. See the next article in this issue for further details.

Contact: Dr. Jean Fetter, Center for Teaching and Learning, Building 20, Room 22C, Stanford University, Stanford, California 94305.

New opportunities for women chemists are being explored at Rosemont College in Pennsylvania. Women college graduates from 1959-1968, whose major subject was chemistry but who have not worked as chemists since their graduation are being offered 1) an opportunity for intensive laboratory work, supplemented by lectures and seminars in chemical principles; 2) a working internship in an industrial laboratory; and 3) career guidance and placement with suitable employers upon successful completion of the training. If successful, this experimental project can serve as a model to recover and update the skills of women who have had previous training in science.

Contact: Suzanne P. Varimbi, Department of Chemistry, Rosemont College, Rosemont, Pennsylvania 19010.

Mills College has a one month internship program which places students in scientific jobs ranging from veterinary assistant to doing research at IBM. Even students with only a year of science and math courses in college have done well in this program.

Contact: Lenore Blum, Department of Mathematics and Computer Science, Mills College, Oakland, California 94613.

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EDUCATING WOMEN IN SCIENCE AND MATHEMATICS: A CONSORTIUM MODEL

by Nancy Kreinberg and Rita Liff, Lawrence Hall of Science
Lenore Blum, Mills College

A new cooperative effort among women scientists, mathematicians, technicians, and educators is flourishing in the San Francisco Bay Area. Since August 1975, 54 women representing 9 colleges and universities, 7 school districts, and 3 corporations have been working together to provide programs to motivate young women toward careers in science and technology. To maintain the momentum of these efforts and strengthen the cooperative network, a consortium model is proposed. The consortium would include the participating institutions mentioned, and other agencies interested in joining this effort.

On March 20, 1976, the network presented a one-day conference on "Expanding your horizons" on the campus of Mills College for 200 young women in grades seven through twelve. Here young women

fields. One emphasis is on teaching computer science to women in sociology, economics, psychology, history, etc., thereby enabling them to use the computer as a tool in research and theory development. A pre-calculus course insures that women who have not taken sufficient mathematics during high school will be able to enter a mathematics or science related major in college, with the skills and confidence required by such study. A pre-medicine curriculum encourages additional women to consider health sciences careers.

Contact: Professor Lenore Blum, Dept. of Mathematics and Computer Science, Mills College, Oakland, Calif. 94613.

California State University at Fresno has conducted a program designed to compensate for both the lack of basic skills and the fear of mathematics before it becomes so seriously implanted in a woman's life that her career goals are affected. Each student receives 3-5 hours of math tutoring per week from peer teachers and group conselling to encourage mutual support and exploration of career options.

Contact: Lillian Faderman, Assistant Vice President for Academic Affairs, California State University, Fresno, Calif. 93740.

California State University at Long Beach has a four-part workshop designed to help adult women overcome math anxiety. As many of these programs do, it relies on games, labs, and other non-standards methods of teaching people to connect with their own innate mathematical ability.

Contact: Ruth Afflack, Departments of Women's Studies of Mathematics, California State University, Long Beach, Calif.

A project at the University of Missouri-Kansas City was designed to strengthen women's background in mathematics through an introductory mathematics sequence for women only with an emphasis on basic skills and applications. Special lectures were given by women with math-related careers, and study-tutoring sessions were provided in addition to the daily classes. The main focus of the program was to open up career options which have been previously closed to women because of their poor math backgrounds. The all-female environment was considered an important factor in the success of the project because it made it easier for class rapport to develop and because many of the students felt it was good.

Contact: Professor Carolyn MacDonald, Physical Science Program, University of Missouri-Kansas City, Kansas City, Missouri 64110.

Wellesley, a women's college, has a course especially designed for mathematically anxious students. The enrollment is kept extremely small, team teaching is used, and a supportive environment is created. Techniques vary widely, with the emphasis on the students developing the material as much as possible. Math labs have been used, and outside lecturers have spoken on their experience as women who use mathematics in their work. As part of the program, psychologists are studying the students' attitudes towards mathematics both before and after the course, and are helping evaluate the effects of the different aspects of the course.

Contact: Professor Alice Schafer, Math Department, Wellesley College, Wellesley, Mass. 02181.

Wesleyan University has a comprehensive program described in the article by Sheila Tobias in the last issue of this newsletter. It is also described in the forthcoming MS. article.

Contact: Sheila Tobias, Wesleyan University, Middletown, Connecticut.

Reinforcing women students' interests in science careers by providing role models of women scientists and/or work experience in science fields.

Hypothesizing that more college women will choose careers in science if there are women role models for them to emulate, if information about career options is made available through improved counseling, and if they can be assisted in developing self-confidence as women scientists through experiential learning, a 4-college cooperative program has been established in Virginia. The four women's colleges - Hollins, Mary Baldwin, Randolph-Macon, and Sweet Briar - offer counseling, seminars featuring successful women scientists, video-taped materials on science careers, and a variety of internships in scientific careers, such as horticulture, forestry, optometry,

interested in science and mathematics were able to meet with professional women in these fields to discuss careers and to participate in workshops that allowed for experimental investigation of scientific principles - giving the students a feel for scientific work.

Evaluation data gathered at this conference indicated a need to reach more young women with information about the variety of careers possible in scientific and technical fields, and to provide role models of women in these fields. Both of these activities seem to be critical to generating interest and confidence in pursuing science and mathematics interests. As one student commented about the conference:

It was very good for me to see so many professional women in what I usually think of as careers that are totally male. It changes my opinion of that career at a much deeper level than if someone had just said to me 'Yes, it is possible for women to go into that field.' To see is to believe.

On April 24, 1976 several hundred science and mathematics teachers, counselors and administrators from Bay Area schools, colleges and universities, along with scientists from industry, met at Mills College for a conference on "Educating women for science: a continuous spectrum." The conference was sponsored by the Center for Teaching and Learning, Stanford University, under the direction of Jean Fetter, and was designed to take a look at positive ways of engaging more girls and women in learning science and math from public school through undergraduate and graduate work. The conference featured a keynote speech by Dr. Estelle Ramey, a panel discussion on career profiles with women professionals in the various science fields, and 14 small discussion groups covering a variety of topics including pre-college and college preparation in math and science, admission and attrition of women in the sciences, jobs for women in science, problems of the female pre-med and medical student, and a counselor's perspective.

As a result of this conference, the network of people interested in educating women for science has grown and been consolidated further. Dr. Fetter is compiling a Bay Area directory.

The NSF's Women in Science Program has awarded a grant to Mills College to sponsor a regional two-day science careers workshop conference in February 1977 for freshman and sophomore college women. It is anticipated that members of the network will participate in planning and implementing this conference.

Thus the groundwork for the consortium has been firmly established. Priorities for future projects are being prepared. With funding, several more programs could be implemented immediately.

The consortium would exist as a coordinating center within a local educational agency, and it would have the following components:

1. Materials/resource/information center, including facilities for student activities
2. Teacher education center, providing inservice and preservice workshops
3. Research center, linking researchers with practitioners and generating ongoing research
4. Dissemination center, providing a mechanism to publicize the consortium's activities and facilitate the outflow of materials to participating members
5. Evaluation center, conducting formative and summative evaluation studies.

The programs developed by the consortium would provide both materials and direct services, and would be available to all participating agencies. Several projects have been formulated that can be developed with funding. Such projects include a career guide with personal statements written by women in scientific occupations; a sourcebook for teachers, counselors and parents to deal with sex-role stereotyping; a mathematical enrichment guide; an activity book for students in grades 3-6 called "Women in Science and Mathematics"; conferences similar to the ones already held at Mills; workshops conducted by high school women for themselves and for younger girls; visits by women scientists and mathematicians to junior and senior high schools; and a tutoring program for high school women having trouble with math.

These projects are the beginning of a concentrated effort to educate women in science and mathematics - fields in which they have been undereducated and underrepresented far too long. Your participation is encouraged. Please call or write for more information: Nancy Kreinberg, Lawrence Hall of Science, University of California, Berkeley, Calif. 94720. Tel: 415-642-1823.

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ANOTHER PROJECT INVITING YOUR PARTICIPATION

Professor Nancy Martin of the University of New Mexico has taught a course there on women in science and will teach such a course this year at Stanford. The course is divided into two parts: an investigation of individual women and their achievements in science from the earliest times to the present; and an investigation of the current status of women in science. An extensive bibliography has been put together and this is intended to become part of a text for women in science courses. She would like to hear from people who would be interested in reviewing the bibliography and giving comments and suggestions for additional material (or deletions). She can be reached at the Computer Science Department, Stanford University, Stanford, Calif. 94305.

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OF POSSIBLE INTEREST

December 15, 1976 is the deadline for proposals for the NSF's 1977 Scientists and Engineers in Economic Development program. The program essentially provides for both short and long-term participation by American scientists and engineers in the scientific communities of developing nations. It is funded by AID. Further information can be gotten from the Division of International Programs, National Science Foundation, Washington, D.C. 20550.

SIGNS is a new journal published by the University of Chicago Press and devoted to scholarship about women. The projected level is high; the various subscription prices are low enough to encourage wide distribution. The August issue is devoted to women in China, and early subscribers will receive a free copy of the anthology "Women and the Workplace".

The Scientific Manpower Commission of the AAAS publishes a journal called MANPOWER COMMENTS, best described as a fat newsletter service. Despite its title, a substantial part of each issue is about women; and it is quite comprehensive. A year's subscription is \$15 and their address is 1776 Massachusetts Avenue N.W., Washington, D.C. 20036. Did you know that women have fewer degenerative diseases than men but 4 to 14 percent more acute illnesses? (from the Census Bureau's report P-23, "A Statistical Portrait of Women in the U.S.").

AAAS report number 76-R-3 is called "The Double Bind: The Price of Being a Minority Woman in Science" and is the report of a conference that took place in December, 1975.

The final version of John Ernest's pamphlet about women and mathematics, Mathematics and Sex, is available. It will appear in the American Mathematical Monthly. Professor Ernest is on the math department of the University of California, Santa Barbara.

The April 1976 issue of SIAM News contains a long interview with Dr. Edith Luchins of Rensselaer Polytechnic Institute summarizing the study she and her husband, a psychologist, did of women mathematicians. Generally straight-forward in tone, the article does contain the following phrase: "Not the stereotyped woman activist, Dr. Luchins is a mother and a grandmother..."

The International Tribunal on Crimes Against Women was held in March in Brussels. Information about it can be obtained from Diana Russell, U.S. Committee of the ITCAW, Berkeley Women's Center, 2112 Channing Way, Berkeley, California 94704.

JOBS

The vacancies listed below appear in alphabetical order in an alphabetical listing of states. EO/AA means Equal Opportunity, Affirmative Action Employer.

Mills College, Department of Mathematics and Computer Science. Instructor or Assistant Professor to teach undergraduate computer science courses (upper division) and some math courses. Teaching load is 9 hours per week. This is a one year position starting September 1, 1976; Ph.D. (in Computer Science) preferred. Contact Lenore Blum, Head, Department of Mathematics and Computer Science, Mills College, Oakland, CA 94613.

San Francisco State U., Assistant Professor, with Ph.D. in mathematics, and teaching experience at elementary or secondary level. Teaching load 12 hr/wk. Tenure track position starting Feb. or Sept. 1977. Apply to Dr. J. T. Smith, Chairman, Mathematics Dept., San Francisco State University, 1600 Holloway, San Francisco, CA 94132. EO/AA

Clark University. Full time position for one year only, Sept. 1976 - June 1977. Research speciality: logic, category theory, and/or topoi. Evidence of good teaching desired. Salary and rank open. Contact Dr. Robert W. Kilmoyer, Chairman Department of Mathematics, Clark University, Worcester, MA 01610.

Ferris State College Data Processing Faculty, teach Data Processing courses, such as systems analysis and design, COBOL Programming. Ability to teach in any of the following areas is desirable: PL/1 Programming, RPG, Teleprocessing, IBM 360-370 Assembler Programming, Operating Systems, and Data Base Management. Bachelors req. w/Masters degree in Business preferred. Start 9-7-76. Apply to Prof. Stuart J. Travis, Head, Data Processing Dept., School of Business, Ferris State College, Big Rapids, MI 49307. EO/AA

Western Michigan Univ., Assistant Professor, Aug. 30, 1976 - April 23, 1977 possibility renewal for additional year. Ph.D. in math. science required. Teaching math. at undergrad. and possibly beginning grad. level; research, preferably jointly w/grad students or other faculty; and seminar work. Approx. \$12,000 academic year. Contact A. Bruce Clarke, Chairman, Department of Math., Western Michigan Univ., Kalamazoo, MI 49008. EO/AA

Moorhead State University. Mathematics Department, two year position, Instructor or Assistant Professor. Start 9-76. Teach undergraduate courses in statistics and freshman and sophomore mathematics classes. Requirements: background in statistics sufficient to teach undergraduate statistics courses at all levels. Ph.D. in Math. or Math. Ed. preferred; Master's degree considered. Contact: Dr. Milton Legg, Chairman, Search Committee, Moorhead State University, Moorhead, MN 56560.

University of Missouri-Rolla. Research Analyst Position available. Min. qual.: B.S. in Comp. Sci., Math., or Physics. Extensive exp comp. programming essential--emphasis on numerical applications and some acquaintance w/physics, chemistry, and cloud physics desirable. Interaction w/theorists developing scientific programs for numerical analysis, molecular modelling, cloud chamber thermodynamics, and minicomputer data acquisition and equipment control. Salary: \$10,000 (dependent on exp. and capability). 9-76 to 8-31-77. Deadline: Aug. 16, 1976. Contact: Dr. James L. Kassner, Jr., Director, Cloud Physics Research Center, University of Missouri-Rolla. Rolla. MO. 65401. EO.

University of Missouri, St. Louis. Nominations and/or Applications for Dean, School of Business Administration. Requirements: earned doctorate, academic teaching exp., and demonstrated qualities of leadership. Significant accomplishments in business, research, and community service are also desirable. Start Fall 1977. Contact: Professor David P. Gustafson, Chairperson, Dean Search Committee, School of Business Administration, University of Missouri-St. Louis, St. Louis, MO, 63121. Deadline 8-1-76. EO.

Stockton State College, Assist. Professor or Instructor, Mathematics. Undergrad. teaching position. Required: Ph.D for Assist. Prof. and Masters for Instructor by 9-76. Teaching load generally 5 courses plus independent study and tutorial teaching. Send resume, letter, and three letters of reference to Dr. Philip Nanzetta, Dean, Faculty of Natural Sciences &

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