

Association for Women in Mathematics

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NEWSLETTER

May-June 1989

PRESIDENT'S REPORT

Mathematics education is in the news and on everyone's mind right now. My local newspaper, the *Boston Globe*, has been running a series of articles on the problem of math and science education in the U.S., including one on the "closing of the gender gap in mathematics." It is encouraging to see these issues being raised in public forums with increasing frequency.

I received a letter from Shirley Frye, president of NCTM, thanking AWM for our endorsement of the Curriculum and Evaluation Standards for School Mathematics. AWM will be listed as a supporting organization when the report is released in late March. Also in late March, I will be attending a CBMS workshop on mathematics education. I hope to report on the workshop in the next newsletter.

I am making continuing efforts to build and strengthen our relationships with professional societies in the mathematical sciences beyond the MAA and AMS. SIAM, which represents applied mathematicians, and ORSA, which is the society for operations research, have both responded quite positively. We will have an AWM table at the SIAM national meetings and have been invited to suggest a way we might participate in the program for the summer of 1990. The AWM panel at the AMS/MAA summer meeting in Boulder is titled "Women in Operations Research: Their Work and Experiences". The panelists are Margaret Wright from AT&T Bell Labs, Janice Hammond from the Harvard Business School, and Margaret Brandeau from Stanford University.

Using the contributions of some generous individuals, AWM is able to help support seven members of the People to People Women in Mathematics Delegation to the People's Republic of China this summer. The recipients are Jenny Baglivo, Nancy Davis, Barbara Jur, Anne Leggett, Clara Lim, Lucy Rakov, and Erica Voolich. We look forward to reports from all of them on their experiences.

Two awards have been made to support Sonya Kovalevsky High School Days at Simmons College in Boston, Massachusetts and at Sweet Briar College in Sweet Briar, Virginia. The funds for these awards came from a grant from Exxon Corporation. Although the application deadline of March 15 has passed, as of this time there are still funds available for additional awards. If your institution is interested in applying for support, I suggest you contact Tricia Cross at our Wellesley office to see if there is still a possibility of obtaining funding. There are stipulations to the award that the event be called a Sonya Kovalevsky High School Day and that all conferences funded by Exxon Education Foundation and AWM be so designated.

Congratulations to Dusa McDuff on being chosen as one of the speakers to launch the "Progress in Mathematics" series at the AMS summer meeting in Boulder. Congratulations also go out to Gail Ratcliff (University of Missouri at St. Louis, analysis on nilpotent Lie groups), Yuriko Renardy (Virginia Polytechnic Institute and State University, stability and bifurcation in two-layer shearing flows), Mary Beth Ruskai (University of Lowell, analytic analysis of multi-particle systems), and

Karen Vogtmann (Cornell University, automorphisms of free groups) who all received Career Advancement Awards as part of NSF's Research Opportunities for Women initiative.

See you all in Boulder in August.

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NSF-AWM TRAVEL GRANTS FOR WOMEN

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

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

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

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

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

AWM TRAVEL GRANTS AWARDED

The mathematicians below were awarded grants in the second award period of the NSF/AWM Travel Grant program. The next application deadline is August 1, 1989.

Estelle Baser, California Polytechnic State University.
Conference: Topics in Pseudo-Differential Operators, Mathematisches Forschungsinstitut, Oberwolfach, Germany. June 11-17, 1989.

Alice Fialowski, University of Pennsylvania.
Conference: Algebras of operators and representations of Lie groups and Lie algebras, Paris, France. May 21-27, 1989.

Jennifer D. Key, Clemson University.
Conference: 12th British Combinatorial Conference, Norwich, England, July 3-7, 1989.

Linda Lesniak, Drew University.
Conference: 12th British Combinatorial Conference, Norwich, England, July 3-7, 1989.

Magnhild Lien, California State University, Northridge.
Conference: Lehigh University Geometry and Topology Conference, Bethlehem, PA.

Victoria Powers, Emory University.
Conference: Quadratic Forms, Oberwolfach, Germany. July 2-8, 1989.

Norma G. Rueda, St. Lawrence University.
Conference: SIAM Conference on Optimization, April, 1989.

HONORS AND AWARDS

Lillie F. Crowley of the University of Kentucky Lexington Community College has received an NSF grant from the Instrumentation and Laboratory Improvement Program. Crowley, Assistant Professor, Physical Sciences and Engineering Technologies, was awarded funding for her project "Microcomputer Laboratory for Calculus Instruction." Congratulations!

Previously we announced that Dr. Susan Mary Rees, Lecturer at the University of Liverpool, had received a 1988 Junior Whitehead Prize from the London Mathematical Society. The text of her citation from the *Bulletin of the London Mathematical Society* 20(1988), p. 639, follows.

Mary Rees is notable for her diverse contributions to the solution of hard analytical problems in ergodic theory and dynamical systems. Her most spectacular theorem has been to show that in the space of rational maps of the Riemann sphere of degree $d \geq 2$ those maps that are ergodic with respect to Lebesgue measure and leave invariant an absolutely continuous probability measure form a set of positive measure. Apart from the intrinsic interest of this result, the methods used also yield many of Jakobson's results concerning quadratic maps of the interval. These methods are destined to have a profound influence on the notoriously difficult problems of dynamical systems lacking a hyperbolic structure.

Mary Rees has several other striking achievements in topological, differentiable, and complex analytical dynamics. She has also studied Fuchsian and Kleinian groups, Γ , clarifying and generalising important work of Patterson and Sullivan by relating boundary Hausdorff measures to Gibbs measures for the case of non-compact $SL(2, \mathbb{R})/\Gamma$. In particular she obtained the remarkable result that the exponents of convergence for Γ and Γ_1 are identical when Γ_1 is a normal subgroup of the geometrically finite Kleinian group Γ with abelian quotient.

Each year six sections of the Mathematical Association of America (MAA) nominate members for MAA Awards for Meritorious Service. Congratulations to recipients Aughtum S. Howard and Paul J. Campbell (information below reprinted from *FOCUS* 8(1988), no. 6, p. 7).

Kentucky Section: Aughtum S. Howard, Eastern Kentucky University, Richmond, Kentucky

Professor Howard has been an MAA member since 1944, and her dedicated service and leadership has sustained and helped the Kentucky Section develop into one of the most active in the Association. She has served as Governor (1951-1954), Chair (1944-1946), and Secretary (1949-1951) of the Section.

Professor Howard is an outstanding teacher and always considered teaching her primary goal. She was one of the founders of the Society of the Sigma Xi Chapter at Eastern Kentucky University, and later served as Chapter Secretary-Treasurer (1967) and President (1970-1971). Through the efforts of her students, Professor Howard was commissioned a Kentucky Colonel in 1964.

Of her MAA award, Professor Howard said, "After being a retired teacher for 15 years, I'm elated that my dedicated services to education and to the Kentucky Section during my teaching years are now being honored." Aughtum S. Howard is retired from her position as Professor of Mathematics at Eastern Kentucky University.

Wisconsin Section: Paul J. Campbell, Beloit College, Beloit, Wisconsin

Professor Campbell joined the MAA in 1965; since then he has been a tireless member of the Wisconsin Section, serving as Secretary-Treasurer (1978-1982), Public Information Officer (1983), and Sectional Governor on the MAA Board of Governors (1984-1987). Since 1980, he has served as Coordinator of the Wisconsin Mathematics League.

Professor Campbell is an Associate and Reviews Editor for *Mathematics Magazine* and Editor of *The UMAP Journal*. He is currently serving on several national MAA committees, including the Committee on the Participation of Women and the Mertens Hasse Prize Committee for Expository Writing.

The Edyth May Sliffe Awards for Distinguished High School Mathematics Teaching were announced in an article of that name by Walter E. Mientka in *FOCUS* 9(1989), no. 1, pp. 11-12. Having taught high school for 36 years, Sliffe felt that high school teachers whose students do well in national competition should be recognized. Having also a sizable stock portfolio, she left a bequest of more than a quarter of a million dollars to the MAA to accomplish this goal. Beginning in 1989, twenty teachers whose teams do well on the American High School Mathematics Examination (AHSME) will be given monetary awards ranging from 100 to 500 dollars, along with a one-year membership in the MAA and other recognition. The awardees will be selected from the top forty United States and Canadian schools on the basis of nominations received from students at these schools. The MAA is pleased to have "the opportunity to recognize teachers whose dedication to developing their gifted students' mathematical talent is outstanding."

BOOK REVIEW COLUMN

Teaching Technology from a Feminist Perspective by Joan Rothschild, Athene Series, Pergamon Press, 1988, paper, ISBN 0-08-034233-7, \$14.95.
Reviewed by Marilyn M. Nelson, 10020 Clearmeadow Dr., Dallas, TX 75238.

The subtitle aptly calls this "A Practical Guide." It is a survey and analysis of university offerings in women's studies, science/technology and society (STS) courses, and similar curricula. Comparisons of questionnaire responses provide grist for the first half of the book; the second half is a wealth of references, resources, and course syllabi.

Today there are over 500 different women's studies programs, over 20,000 courses. "Feminist perspectives bring an approach to knowledge that is holistic, that is grounded in the experiential, seeking to draw on the total human experience and transcend the subject-object split of much of traditional Western scholarship." For example, I loved having the "sacred cow" of objectivity as an essential part of the scientific method questioned with the suggestion that "an involved, interactive approach to subject matter is not only feminist but good scientific practice." Not only are we redefining what is significant technology, we are "transforming the way we think about, research, and teach about technology."

Rothschild draws on five developmental phases (as outlined by Peggy McIntosh at a 1983 conference at Wheaton College) in the transition toward true integration of women's scholarship into the curriculum:

1. Womenless History — the traditional.
2. Women in History — add some token outstanding women as examples (the "add women and stir" method).
3. Women as a Problem, Anomaly, or Absence in History — asking the question, "Why did women's realities get left out?"
4. Women as History — a radical shift to include women; emphasis is on demonstrating inclusiveness.
5. History reconstructed, redefined and transformed to include us all.

These five phases provide a screen by which you may evaluate current courses and resources. Observations made and questions raised are: Should the approach be *implicitly* to "integrate women and mainstream," or to critique the existing approach and *explicitly* focus on women? Are the earlier phases necessary? Courses which emphasize the problems engender hostility (from males — especially 18-22 year-old business majors!) while courses that mask the feminist approach and make "no big deal" of it encounter little opposition. No wonder — the words can sound good but the realities remain "business as usual" — and society stays paternalistic!

In phase two the traditional framework has not been questioned, and it is easy to isolate and dispense with the new elements. Phase three articulates a feminist conceptual framework and presents unsettling new ideas. Although some courses have reached phase four, history is still compartmentalized (albeit more inclusively!). Phase four must begin to question the conceptualization of "Western Civilization" itself. Focusing on female experience is essential to understanding the current distortions and imbalances; only then can inclusive human experience become a transformed basis for knowledge. Rothschild suggests phase five requires going back to the earlier phases, which cannot be skipped. Thus, each course has its niche in the integrative process.

The question of what constitutes a feminist resource is beautifully illustrated via contrasting paragraphs from two recent books about computers and human culture. Noting the use of gendered language and style, comparisons are made: one style is distanced, uses some token language but is still assuming a male audience; the other is interactive, inclusive, drawing you in. I was amazed — enlightened — exposed!

Last summer I wrote an article for the Society of Women Engineers publication *U.S. Woman Engineer*. I interviewed five women doing research in artificial intelligence and five women working on AI applications. The first draft was highly interactive. Although I had no complaints from any of the interviewees nor from my own departmental colleagues, one of my interviewee's managers objected hotly to what he termed a "folksy" style, saying it had no place in an academic journal. Intuitively, I knew what he meant and revised the style. After reading Rothschild's book the issues are much clearer. My style, perhaps "too feminist," was very offensive to a traditionalist. I am better prepared to hold my own now, to focus on what I really want to accomplish, and to understand what's at stake!

This book was highly specific and practical — describing courses, raising issues, sharing resources, methods, and problems. I teach technology in industry and am always looking for ideas I can use in my own classrooms. Often, it seems, I find what I am looking for. This book was no exception.

Teaching for the Two-sided Mind by Linda Verlee Williams, Simon & Schuster, Inc., New York, 1983, ISBN 0-6671-62239-0.

Reviewed by Martha Smith.

Early in my teaching career, when I expressed frustration over some teaching incident, a friend offered the advice, "Never assume anything is obvious," to which I frustratedly replied, "But how do I know in advance when I'm assuming something is obvious? And how do I explain it to someone else if it's obvious to me?" That conversation is a hint at what I believe is an important key to being a good teacher: the continual process of becoming aware of what is obvious to you but not to your students, and figuring out how to explain (or communicate, or instill, or whatever) it to (in) them. Often, it is a process of learning by making mistakes. But when you're lucky, you can learn from others' experience. I consider myself lucky to have found this book (in a local women's bookstore) and recommend it to any of you who teach. Although the book is aimed at primary and secondary teachers, it has many ideas useful for college teachers as well.

In the first two chapters, Williams discusses research into how the brain functions (pointing out that many popular accounts of left-brain/right-brain thinking are overly simplistic and misleading) and its implications for teaching. Amongst other things, she points out what many of us realize but wish were more widely appreciated: that often computational skills are emphasized in early mathematics education to the detriment of the development of the spatial skills that are so important later. Chapter Three discusses thinking styles and the development of process awareness. I found many of the ideas in this chapter especially useful in a course in problem solving I taught for preservice elementary school teachers last fall. I was also delighted to see the inclusion of "kinesthetic thinking," something I do and have on a few occasions heard other mathematicians refer to.

Chapters four through eight each discuss a specific teaching technique or topic: metaphor, visual thinking, fantasy, multisensory learning, and direct experience. I approached the chapter on metaphor with some reservation, thinking "Oh no, this is going to be, 'Oh, look, these ideas are similar!'" with no attention to the importance of in-depth thought. I was pleasantly surprised. A large part of Williams' message here is: whenever you or a student say "X is like Y," go on to ask, "How are they alike?" and then "How are they different?" In other words, the time-honored method of compare-and-contrast, which seems to have slipped from its rightful place as an important educational technique.

Topics emphasized in the section on visual thinking include the importance of training students to extract information presented visually, the importance of the distinction between describing and labeling, ways to represent information visually, and the use of visualization as a memory aid. Fantasy might not seem relevant to mathematics, but it has in fact been used in overcoming math anxiety and test anxiety.

The final two chapters include suggestions for how to go about including ideas from the book in your own teaching. The tone throughout the book is encouraging, almost rejuvenating, including many practical suggestions without being prescriptive. I heartily recommend the book to anyone who teaches. I implore anyone who teaches elementary school teachers to read it.

Gender and Language in Textbooks. I am using Hoffman and Kunze's *Linear Algebra* in my honors linear algebra course this semester and was disappointed to find a couple of places where they say, "the reader ... he ...". Had I noticed that before adopting the text, I probably would have at least looked at others. If you know of other texts that have such language, or if you know of some that are exemplary in including women as readers, please send me a note, and I will include them in a future column.

Book Review Editor:

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HELP PRESERVE AWM'S HISTORY

In an effort to document and preserve its history, the Association for Women in Mathematics has given the Association's older records to Wellesley College. Those records of the Association no longer needed for current business (generally things generated prior to 1985) have been placed in the Wellesley College Archives where they will be made available to scholars and others interested in the work of the Association.

The Wellesley College Archives would welcome additions to this collection, especially any files pertaining to the early years of the Association. Questions regarding additions to the collection should be directed to Wilma R. Slaughter, Wellesley College Archives, Margaret Clapp Library, Wellesley, MA 02181 [(617) 235-0320 ext. 2128].

GENDER IN ACADEME

"Gender in Academe: The Future of Our Past," the first annual conference on gender in academe, will be held November 2-4, 1989, at Sabal Park Holiday Inn and will be hosted by the University of South Florida, Tampa, FL. The Conference will provide a lively forum. Nationally recognized scholars, including Sue V. Rosser and Gerda Lerner, from the disciplines of sciences and applied professions, humanities, and social sciences will keynote the conference to facilitate the exchange of theory and research.

Issues to be considered include women as teachers, scholars, researchers, administrators, writers, and students; gender and the curriculum — what we learn, what we teach, overt and covert exclusion, bias, stereotyping, curricular revision; intersection of gender, race, class, ethnicity, and disability; and education — catalyst for change or protector of the status quo?

For further conference or registration details, contact Lee Leavengood, University of South Florida, LLL 012, Tampa FL 33620 (813) 974-2403.

AWM EDUCATION COMMITTEE COLUMN

Ann Moskol (Associate Professor of Mathematics/Computer Science, Rhode Island College), a member of the AWM Education Committee, received a grant from the Swedish Institute for a study visit to Sweden in June, 1988, focusing on Swedish projects to encourage women to enter technical careers. What follows is the first of a two-part adaptation by Professor Moskol of her report to the Swedish Institute. In this issue, the column covers education projects. In the next issue, the column will cover working life projects and recommendations. [See the *AWM Newsletter*, November, 1984, for an earlier committee report on Sweden.]

My three weeks in Sweden were wonderful and memorable. I met teachers, vocational guidance counselors and students from a variety of levels and schools. I also talked with people at universities and institutes of technology, government bureaus (Departments of Education, Labor and Working Life) and government research institutes. Because of an acute shortage of skilled technical workers, Sweden is doing much to encourage females to pursue technical careers. Some of the projects involve girls as young as five years old! The emphasis was mainly on technology and physics, but of course these require more mathematics than is commonly studied.

In the 1970's, women in Sweden, like those in other industrial countries, entered the workforce in record numbers. As women became both an economic and political entity, global attention focused on women's issues. In 1975, Mexico City was host to the United Nations Women's Conference, with which the international women's decade began.

During the 1970's, Sweden financed some pilot programs and research, passed legislation, and instituted educational reforms to address the problem of inequality in jobs and society. For example, a project in Kristianstad encouraged females to enter technical fields where there was a shortage of

skilled workers [Liljestrom *et al.*, 1975]. In education, equal opportunities for boys and girls were stressed in the curriculum revision of 1969 and were implemented in the 1970's. Vestin made recommendations based on her work with the Sex-Role Project (1970-1975), and various pilot projects to support sex-role equality were implemented [Scott, 1982]. Widmark found that females were treated differently in school [Kalvemark, 1983, p. 9]. Political pressure led to equality bills, which included the 1974 parental insurance legislation that entitled both parents to share a paid leave of absence for a total of nine months for the birth of a child.

These measures were not enough to erase years of sexual stereotyping and inequality. In 1979, Scott [1982] reported that she found widespread dissatisfaction because the goals for sexual equality had not been met. Faced with the pressing need for skilled workers in technical jobs and supported by the political power of female labor ministers, Sweden in the 1980's committed much money to support projects in education and labor designed to help solve the problem of sexual inequality.

In 1983, the Swedish Ministry of Labour (under the leadership of Anita Gradin) provided 10 million SEK (1 SEK = \$.14 in 1983) for "a campaign to increase girls' and women's interest in technology, broaden their choice of education and career, and to stimulate recruiting and higher education to more qualified positions in industry" [Swedish NBE, I 8:74, p. 13]. From these funds, education projects received roughly 4.5 million SEK with each institute of technology obtaining about 500,000 SEK for projects to increase females' interest in technology. During 1985, the government funded school projects with another 2.5-3 million SEK [NBE, I 87:29, p. 4].

Sweden is working with the other five Nordic countries in projects to encourage the entry of females into technological fields. In 1985, at the conclusion of the "women's decade," the Nordic countries initiated the BRYT project to "break the sex segregation of the labour market" [Nordic BRYT-Project, 1987, p. 1].

Sweden, a technologically advanced country with a population of only 8.3 million people, is facing a critical shortage of engineers. It is estimated that by the year 2000, Sweden will need 363,700 engineers, which is 111,800 more than in 1980 [Klevard and Sternerup, 1986, p. 2]. To help alleviate this shortage, Sweden has been working hard, especially through education programs, to increase the number of females in technical fields.

EDUCATION PROJECTS

In the ninth grade, students apply to study a specific area of specialization for upper secondary school. Girls typically choose humanistic and social services lines, while boys more often choose technical lines. Additional points are added to those applying to nontraditional lines, "but little use is made of this opportunity" [Ericsson and Jacobsson, 1985, p. 31]. Although most lines are still very segregated, notable progress has been made in the four-year technical line which had 22% females in 1985 compared to 7% in 1971.

While early projects concentrated on girls in the ninth grade, present projects are being done at all levels, starting with girls in preschool. Sweden now realizes that if real change in attitudes is to be made, it is necessary to start early.

Preschool

According to Christine Sternerup, it is important to teach children about "technics" early so that "the children will think that technics is something fun that they worked at" in day care, and "that they will work with it when they are grown up." In 1985/86, the Ministry of Health and Social Affairs provided 3.3 million SEK for "development work aimed at evolving methods for introducing technical education at day nurseries and pre-schools" [Klevard and Sternerup, 1986, p. 5]. Projects in Vasteras, Stockholm, and Gothenburg involved developing suitable materials and training teachers. In all cases, the money for the projects had run out, but people were optimistic that the projects could continue either through local funding or support from preschool teachers.

In Vasteras, I spoke with two professors at the University of Eskilstuna-Vasteras who had set up a model technology room that girls five to ten years old could visit along with their teachers. The Vasteras project was just for girls, because "they have different questions." The demonstrations were diverse: toy car lanes made out of different types of materials to teach about friction, a volcano made out of clay, sets of pulleys, and a doll house with electricity. According to one faculty member, "when we started, the preschool and recreation teachers were very nervous, but then they saw that we wanted to do it in a simple way." One important byproduct of the Vasteras project is that prospective elementary and recreation teachers now learn technology in their methods courses.

In Stockholm, the Royal Institute of Technology has developed an inservice training project and a book, *Children Asking About Natural Science and Engineering*, for personnel in daycare centers. About ten preschool teachers have been trained in these materials and use them in preschools in their community. The preschool teachers were very enthusiastic about the material.

Comprehensive School

1) Required Technology Courses

According to the new Compulsory School curriculum, which was implemented in 1982, all pupils in grades 1-6 are supposed to read technology. Since current Compulsory School teachers were not trained in technology, much inservice teacher training was provided, especially in 1982-83. However, several people commented that the inservice program was not sufficient to overcome the fears and the lack of knowledge of many Compulsory teachers, and that lower grade teachers rarely teach technology. One person thought that the training "was a complete flop, because it was not enough, and by now, they have forgotten all that they have learned." Another related how two teachers, after participating in the program, "were still afraid, and they felt that they would have to work very hard to get equipment and things; they didn't do it and they felt very bad about it."

The government has funded programs for university students to teach technology classes to young children in school. These programs allow the students to share their enthusiasm for technology and provide important lessons for the children.

The new Compulsory School curriculum also requires that senior level students study technology for two periods per week. "Technology as taught in Compulsory School is a wide-ranging subject, including everything from everyday technology to complicated industrial processes and computerisation" [Klevard and Sternerup, 1986, p. 6]. In addition, students can elect further technical courses; of the 15% who choose these electives, 90.4% are male [Klevard and Sternerup, 1986, p. 6].

Most schools that I visited were using computers for word processing; one school had recently installed IBM microcomputers and was planning to teach an optional course in Pascal programming. Most technology teachers are male. Sonja Jakobsson, a technology teacher in Vasteras, found that she encountered many difficulties with male teachers when she began to teach the new subject about five years ago.

2) Special Courses for Girls to Help Build Their Confidence

A) Technology: In Vasteras, Ms. Jakobsson, a technology teacher at the senior-level St. Ilians Skola, developed and taught a 10-lesson course on technology for 12-year-old girls to help prepare them for technology at senior level. Prior to this course, Ms. Jakobsson found that unlike boys, girls lacked confidence to do technical work; girls often said that their fathers did the technical work at home. I met two girls who had recently completed this voluntary course. They chose this course (instead of dancing) to help them gain confidence in technical things. "I thought it would be interesting to touch the machines, so I wouldn't be afraid anymore." In this course, the girls used various tools including microscopes, soldering irons, drills, computers, Bunsen burners, and rectifiers. The two girls proudly showed me the completed metal pieces that they had soldered.

B) Special Summer Programs: For the past four years, girls completing the eighth grade throughout Sweden have had the opportunity to participate in a two-week summer program in technology. The courses combine both theoretical and practical work. For example, the schedule for the 1988 summer program at Aso Gymnasium in Stockholm consisted of practical work in building, machinery, lathing, computers, chemistry, and architectural drawing, as well as visits to a housing, building, or electrical company [Ericsson].

In 1985, the government provided 2.7 million SEK for summer courses in technology for girls; altogether 284 municipalities (out of 330 which applied) were given government grants of 9,500 SEK per course [NBE, I 86:74, p. 65]. The municipalities also contributed money for the courses, which cost between 15,000 and 20,000 SEK. The students often received a financial stipend (about 40-50 SEK per day) plus lunch and travel money.

Although most courses are taught by male vocational teachers in the upper secondary schools, schools try to use female teachers whenever possible. For example, Aso Gymnasium in Stockholm now uses female technology students as teachers, because they can identify with the girls. At Almasskolan in Boras, the teachers were male, but a female technician helped the students with their projects.

The summer program is very popular with the girls, and there are often more applicants than available places. The girls that I talked to at Almasskolan were very pleased that they could now operate the machines without being afraid. The girls were enthusiastic and proud that they were making something that they could take home.

C) Computers: Few females in comprehensive school are interested in computer science. There is much concern about this lack of interest, because a good knowledge of computers will be necessary for productive jobs in this increasingly technological world.

To help interest girls in computers, the town of Varmdo selected two girls in each eighth grade class to learn computer science. These girls then helped teach computer science to other students in the ninth grade. This program was expanded so that the girls learned computer science in the seventh grade, and then taught it to eighth and ninth graders.

3) Inservice Programs for Teachers

Most agree that it is especially important for comprehensive school teachers, many of whom are female, to provide an environment for girls that enables them to learn and develop their interests. Unfortunately, Swedish researchers in the 1970's found unequal treatment in schools. Boys were given more help and encouragement than girls and more questions and tasks to complete [NBE, I 86:74, p. 12]. (This result has been found in the United States also.)

Starting in 1983, Sweden provided funds for informational programs so that teachers would learn how to be sensitive to sex bias in their own teaching and in guest speakers. One person related how primary teachers must be careful not to let people from the fire brigade, for instance, tell the little children that "stupid" mothers "leave the pots on the stoves. And what happens? The house catches on fire, and the big firemen come in."

Both the local school board of Stockholm and the Royal Institute of Technology have held week-long courses to help acquaint study and career counselors with technology. About 15-20 counselors have attended the summer course run by the local school board for each of the past two years. About 30 counselors (27 of whom were women) from both elementary and upper secondary school attended a residential course at the Royal Institute which was held during the school year. Although this live-in course is very expensive (100,000 SEK for 30 people), officials at the Royal Institute feel that it is very successful in explaining technology to teachers.

4) Girls Explore Technological Careers

Sweden requires that schools teach students about career opportunities through discussions, visits, and on-site training. Altogether, each Swedish student spends six to ten weeks visiting or working in various employments during Compulsory School. The current curriculum recommends that students gain hands-on experience in a job from a non-traditional sector. Since females have been traditionally underrepresented in technical careers, many schools require girls to visit and learn about technical jobs.

5) Programs for Ninth Grade Girls

Many technical upper secondary schools invite ninth grade girls to visit their schools and meet with students and teachers. Both gymnasiums that I visited (Aso and Wenstromska) had held these programs. At Aso, the school also invited female engineers to talk to prospective students.

These informational programs for ninth grade students are particularly effective in increasing the percentage of females in the technical lines; when information activities were curtailed (in 1981), the number of girls decreased, while increased activities resulted in increased enrollment (1976, 1982, and 1983). In 1976, when Christine Sternerup started working as a study and vocational guidance counsellor at Thorildsplans Gymnasium, there were only two girls in the first year of the four year technical line; after much information activity, there are now 25% in the technical line.

Upper Secondary School

Since more females than males leave technical lines, many schools have support programs. Aso Gymnasium plans regular meetings to see what is "good or bad." According to the director of studies, the girls in technical lines leave because they get no support from their homes.

Many colleges invite girls to participate in an on-campus visit to encourage them to pursue technical education. As the number of college age students decline, there is much competition to find competent students.

Linköping Institute of Technology invites high school students to take a three-day course in technology. Chalmers Institute of Technology holds day courses for girls in their last year in gymnasium and sends posters directed to girls who live too far away to participate in on-site programs. At the Royal Institute of Technology, about 50-60 girls in upper secondary schools participate in a two-day course. In addition, the Institute has prepared a pamphlet with pictures of female engineering students and descriptions of their studies.

Vasteras ran a mentor program for upper secondary school girls in technical fields. The mentors received their pairings after attending several preparatory evening meetings. The girls were supposed to meet several times with their mentors, with at least one meeting at the mentor's place of employment. In reality, the experiences of the student-mentor relationship widely. I spoke to a female student who had met only once with her mentor; however, some of her friends had met several times with their mentors, including lunch or dinner meetings.

Higher Education

Relatively few females pursue a technical subject in higher education. In 1987 at the Royal Institute of Technology, 20.9% of the entering students were female. Many people are particularly concerned that so few females choose to major in the new field of computer science (in 1987, only 9% at the Royal Institute) since, for computer science, no tradition as a male field had existed.

Compared with the lower levels, there is relatively little work being done for female students once they arrive at a university. Those few females in technical fields do not perceive any disadvantage for themselves once they have been admitted to a university. Female engineers at Eritel AB said that the higher they have gone, the easier it has been. According to Christina Sternerup, the dropout rates for females are similar to those for males at the Royal Institute. Also, females say that it is not difficult to be female at the Royal Institute. "The females here are very active, and they refuse to see any differences. It's a kind of defense; they don't want to think about it." The same sentiment was echoed by computer science students at Chalmers Institute of Technology. One problem with this type of complacency is that the females at Chalmers, involved with their own work, saw no need to encourage other, younger females.

At the graduate level, extremely few women earn doctoral degrees in a technical field. According to Professor Gudrun Brattstrom of Stockholm University, a list of all the women who had ever received a Ph.D. in mathematics in Sweden would fit on one small sheet of paper. As she discovered at a meeting of European Women in Mathematics, there are fewer female mathematicians in Sweden than in Italy and Portugal. Professor Brattstrom thought the explanation might be that females need encouragement, but that Swedish universities don't do much to support their graduate students.

Adult Education

The folk high school for women in Gothenburg provides educational opportunities for adult women in a cooperative support program. Many of the women are immigrants; some have menial jobs, others are unemployed. Most women have not graduated from high school. The folk high school provides an opportunity for women to build up their confidence in a supported environment where they can study at their own speed. To accommodate women's child care obligations, the courses are scheduled from 9 AM to 3 PM, and a day nursery is provided. The program is particularly valuable to immigrant women from Iran and Iraq who are not permitted by their culture to study with men.

Although the folk high school offers courses in English and Swedish to help prepare students for higher education, the majority of students take elective courses for enrichment. The folk high school offers courses in women's studies and short courses in a variety of subjects. I visited a short summer course on technology where women were learning about wiring in a cooperative laboratory. The women, many of whom were immigrants, were enthusiastic about learning this new skill.

Future Developments

In March 1988, a new government bill outlined a program for establishing equality in the 1990's. In technical education, the goals are: 1) at least a third of the applicants in technology at the upper secondary school should be females (at present, 20% are female), and 2) decrease the percentage of female dropouts. As a start in implementing these goals, the bill sets a goal of 20% for the minority sex in one technical field and one female field (nursing). To implement these goals, a committee was to be formed in July of 1988 to plan which projects should be allocated funds.

This bill is consistent with the goal of the National Board of Education that "no line of upper secondary school in five years' time ought to have fewer than 20 per cent of the minority sex. The technology line should include 40 per cent girls" [NBE, I 87:29, p. 6].

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MEETINGS

SIAM Annual Meeting

The Society for Industrial and Applied Mathematics (SIAM) will hold its 1989 Annual Meeting July 17-21, 1989, at the Sheraton Harbor Island Hotel in San Diego, CA. The meeting will be preceded by a short course held July 16 on signal processing. Topics covered will include signal processing, parallel computation, numerical analysis, linear algebra, computer science, discrete mathematics, nonlinear fluid dynamics, numerical PDE's and ODE's, scientific computing, inverse problems, optimization, control, and dynamical systems.

AWM will have a presence at the meeting. Tricia Cross, our Executive Director, will run an AWM table there.

Pi Mu Epsilon Diamond Jubilee Celebration

press release, adapted from an article in the *AMS Notices*

In celebration of its 75th anniversary, Pi Mu Epsilon (PME), Incorporated, the international honorary mathematical society, will hold a Diamond Jubilee celebration, which will take place at the Joint Mathematics Meetings in Boulder, Colorado, August 7-10, 1989. As part of the celebration, PME is planning a number of special scientific and social events.

To mark this special event, the AMS has provided funds for a new Diamond Jubilee commemorative prize. The \$1000 prize will be administered and awarded annually by PME, beginning this year.

In Boulder, the celebration will include an expanded scientific program, featuring the J. Sutherland Frame Lecture by Jane Cronin Scanlon of Rutgers University. In addition, Joseph A. Gallian of the University of Minnesota-Duluth will present a special AMS-MAA-PME address. A series of contributed paper sessions will give undergraduate students an opportunity to present papers.

Several social events are planned for Boulder. The celebration kicks off with a reception on August 7, and there will also be the PME banquet and other activities. "We hope it will be a mathematically enriching and festive time," says Eileen Poiani, President of PME.

In addition to the events at the Boulder meeting, PME plans to issue a special commemorative issue of the *πμϵ Journal* as part of the Diamond Jubilee. PME has published the semiannual journal since 1949.

PME was founded in 1914 at Syracuse University with the goal of promoting scholarship in mathematics. Through its more than 260 chapters nationwide, PME seeks to encourage more students to persist in mathematics and to pursue careers in mathematics research and related areas. Members

are generally inducted into PME as undergraduate students and remain members for life. However, individuals need not be students to join, and they need not be affiliated with academic institutions.

PME encourages colleges and universities to send undergraduate student speakers and delegates to the Diamond Jubilee. There will be travel grants available for delegates and for students selected to present papers at the meeting. Information was sent in April to colleges and universities across the nation with PME chapters.

For more information, contact Eileen Poiani, President of PME, Saint Peter's College, 2641 Kennedy Boulevard, Jersey City, NJ 07306; or Robert Woodside, Secretary-Treasurer of PME, Department of Mathematics, East Carolina University, Greenville, NC 27858, (919) 757-6414.

HIGHLIGHTS FROM THE 1987 SURVEY OF DOCTORATE RECIPIENTS

Presented below are findings from the 1987 Survey of Doctorate Recipients, a biennial employment survey of doctorate holders in the sciences, engineering, and the humanities, which is conducted by the National Research Council. The findings highlighted here include the demographic composition of the doctoral population, as well its employment status, employment sectors, and primary work activities.

Profile: Doctoral Scientists and Engineers

Demographic Characteristics

In 1987, the total population of doctoral scientists and engineers residing in the United States numbered about 451,000, up from 304,000 in 1977. Doctoral scientists comprised approximately 84 percent of the 1987 population and doctoral engineers, 16 percent.

Of the total estimated number of doctoral scientists and engineers, 84 percent were men and 16 percent were women. This marks a shift over a decade prior when women represented only 10 percent of this population.

In terms of the racial composition of doctoral scientists and engineers, 89 percent were white, two percent were black, and eight percent were Asian. (One percent could not be classified.) Hispanics accounted for about two percent. Although Asians increased their representation by two percentage points between 1977 and 1987, trends for the remaining minority groups were relatively stable.

In 1987, over one-half of doctoral scientists and engineers were 45 or older. This compares with about two-fifths who were 45 or older in 1977.

Employment Characteristics

Of the total population of doctoral scientists and engineers, approximately 94 percent were in the labor force (defined as those employed and those seeking employment). An additional one percent were not employed (and not seeking employment), and five percent were retired.

The unemployment rate, expressed as the percent of the labor force who were unemployed but seeking employment, was estimated at one percent.

Of those employed, roughly 92 percent were working full-time, five percent were working part-time, and three percent were on postdoctoral appointments.

The field distribution of employed scientists and engineers follows: (field classified according to the National Science Foundation definitions, percentage) (N = 419,100) chemists, 10.5; physicists/astronomers, 5.8; mathematical scientists, 4.0; computer/information specialists, 4.4; environmental scientists, 4.2; life scientists, 25.6; psychologists, 13.5; aero/astro engineers, 1.2; chemical engineers, 1.7; civil engineers, 1.5; electrical/electronic engineers, 3.0; mechanical engineers, 1.6; and other engineers, 7.3.

A majority (52 percent) of those employed were working in educational institutions, while 31 percent were employed by business/industry. The federal government employed seven percent, followed by nonprofit organizations (four percent), hospitals and clinics (three percent) and other employment sectors (three percent).

Of those working in universities or four-year colleges, about 44 percent held the rank of full professor. Associate professorships and assistant professorships accounted for 26 and 19 percent, respectively. Four percent were instructors, lecturers or adjunct faculty. The remaining eight percent were in administrative or nonfaculty positions.

In 1987, median salaries of engineers exceeded those of scientists, \$58,100 compared with \$47,800. With the exception of civil engineering, median salaries in all engineering fields were higher than those for scientists.

Research and teaching dominated the work activities of doctoral scientists and engineers. In 1987, almost three of every five reported one of these areas as their primary focus. Work activities, however, differed between scientists and engineers. Doctoral scientists were concentrated in basic or applied research (32 percent), teaching (29 percent), or professional services (9 percent). Doctoral engineers were concentrated in applied research (24 percent), R&D management (16 percent), and development (14 percent).

DISCRIMINATION AND THE LAW

AAUW LEGAL ADVOCACY FUND

press release

Sharon Leder's sex discrimination lawsuit against the State University of New York at Buffalo has won support from the Legal Advocacy Fund of the American Association of University Women (AAUW). Leder twice applied for promotion to associate professor with tenure. Despite recommendations by both departmental and personnel committees that promotion and tenure be awarded, her applications were denied by the President's Review Board on Faculty Appointments, Promotion, and Tenure. Leder charges that the negative decisions came because of sex bias, and because of undervaluing of her field of women's studies/feminist literary criticism. Her lawsuit is filed under Title VII, and involves a number of additional charges related to conditions of employment.

The AAUW Legal Advocacy Fund is supporting Leder by providing \$2,000 to offset expenses and by publicizing the case to the 150,000 AAUW members throughout the U.S. According to Sharon Schuster, Woodland Hills, CA, President of the Fund Board, "Many women in higher education face discrimination, but the problem is especially severe for women like Sharon Leder whose scholarship focuses on the special concerns of women."

AAUW pamphlet, "Equal Education in America? The Jury is Still Out ..."

As President of the Student Athlete Council at Temple University, Rollin Haffer led a group of eleven women student athletes in a Title IX suit against the university. They documented a pervasive pattern of sex discrimination in the intercollegiate athletic program, including inadequate scholarship funds, assignment to the least desirable fields and gyms, inferior and unsafe equipment and supplies, inadequate travel accommodations and the lack of a locker room for female athletes.

"Knowing what was required by Title IX, there was no doubt in our minds that Temple University was indeed breaking the law," says Haffer. "The anger and frustration that built over the University's lack of concern for its women athletes needed to be channeled towards a productive solution. That was when the female student athletes voted, almost unanimously, to go ahead and sue the university ..."

In 1984, attorneys for Temple moved to dismiss the case in light of the U.S. Supreme Court's holding in the *Grove City* case that Title IX's prohibition of sex discrimination in educational institutions applies only to programs that directly receive federal funds. The Court then ruled that the Title IX claims would be limited to scholarships and financial aid only. The *Haffer* Complaint was amended to charge the university with violation of Pennsylvania's state ERA and the 14th Amendment to the U.S. Constitution, as well as Title IX. The Court ruled in February 1985 that the case could continue under the Constitutional claims, the state ERA and only those Title IX charges concerning inequities in athletic scholarships and financial aid.

Rollin Haffer has long since graduated from Temple. But her struggle for justice continues. "I became personally involved in our lawsuit because I honestly cared about the women who would follow after me. It did not matter that I may never know many of them personally. What mattered to

me was that I knew what they would go through if things did not change. I wanted to make it better for them. They, like everyone else, deserve to grow up in a society that is fair and just.”

Rollin Haffer's case is only one of thousands filed each year by women seeking judicial redress for sex discrimination. Litigation is a lonely, long and expensive process, but it remains a critically important frontier in the struggle for equity.

For six years, the AAUW Legal Advocacy Fund (LAF) has stood beside plaintiffs like the women athletes of Temple University, offering its financial support and organizational endorsement. As the only legal fund for women focused solely on higher education, the LAF plays a unique role in ensuring that the legal process is responsive to women's rights.

Today these legal efforts are more important than ever. ... AAUW is not concerned solely with Title IX cases. Its interest spans the entire range of litigation associated with higher education — faculty, administrators and other staff — and their concerns in the areas of compensation, promotion and tenure. It extends to students and their conditions of study, including cases related to financial aid and sexual harassment.

While the AAUW Legal Advocacy Fund does not believe litigation is the *only* answer, it believes it is *one* important option in the struggle to remove barriers to women's achievement. Legal advocacy is yet another critical route to equity, consistent with AAUW's work in the areas of public policy advocacy, legislative change and public education.

The LAF does not offer direct legal assistance, but rather the financial assistance and other support necessary to sustain a case. Here's how it works. The LAF Advisor Committee (a majority of whom are attorneys) works with the Legal Advocacy Fund Board to review and select cases appropriate for LAF support. Criteria for acceptance of cases include the plaintiff's need for financial aid, a high probability of success, and the potential significance of the case for women in higher education. In some cases, the LAF provides direct financial support. In others, it endorses a case and channels tax-deductible contributions from supporters to that case.

One legal critic has observed that “law is nothing unless close behind it stands a warm living public opinion.” To each case it adopts, the LAF brings the full weight and stature of AAUW's continuing commitment to the advancement of women. In this way, the LAF works to ensure that the courts keep pace with women's evolving quest for equality.

You may never find yourself in a situation like that experienced by Rollin Haffer ... or the Cornell 11 ... or any of the thousands of other women who have gone to court to sue for justice. But if you do, you'll want to know you have the support of an organization like the AAUW Legal Advocacy Fund. That's why AAUW members and other women's advocates have supported the LAF — as an investment in their own futures and those of their friends, colleagues, sisters and daughters.

Now you can help too. Since the LAF is a charity, your contribution is tax-deductible. You can earmark your contribution for a specific case adopted by the LAF Board [the contribution will be forwarded to the plaintiff following deduction of a 20 percent administration fee], or you can use your gift to support the LAF as a whole. Anyone can support the LAF. While AAUW established the Fund, contributions to those seeking legal redress are not limited to AAUW members. Everyone committed to the cause of equity can play an active role in insuring its future in academia.

The jury is still out on equal education in America, but with your help, the verdict can be a progressive one. Help us help women across the country get their day in court.

For further information, or to make a contribution, contact the AAUW Legal Advocacy Fund at 2401 Virginia Ave., N.W., Washington, DC 20037, or call (292) 785-7700.

The following cases demonstrate the diversity of complaints the LAF has supported:

Zahorik v. Cornell University was the case that started it all. The needs of a group of faculty women known as the “Cornell 11” who charged sex discrimination in tenure and salary decisions sparked the creation of the Legal Advocacy Fund.

Penk v. Oregon State Board of Higher Education was the first class-action sex discrimination suit ever filed against an entire state education system. The case was brought by women from eight institutions who charged inequities in salary and promotion.

Haffer v. Temple University is a case filed by women student athletes who charge discrimination in allocation of funds to the school's athletics programs and in financial aid.

Webster v. Mohawk Valley Community College was filed by a female instructor against a community college in New York State. She alleges that she was demoted in retaliation for her efforts to ensure enforcement of the college's anti-discrimination policies.

Boucher v. Fordham University is a lawsuit in which a woman professor of theology charged that she was denied tenure because of sex bias. The case was settled out of court.

Austen v. University of Hawaii alleges discrimination against a tenured faculty woman because of her efforts to advance the hiring, promotion and tenure of women in her department.

Roberts v. College of the Desert is a suit in which a professor alleges that she was denied promotion and other opportunities for professional advancement because of her sex.

Bayer v. University of Maine at Orono is a case involving a Ph.D. candidate's allegation that female students were required to submit to sexual advances by male professors as a condition of advancement in the psychology program.

Paul v. Stanford University, a sex and race discrimination lawsuit, was filed by a woman of Japanese ancestry who was denied tenure in Stanford's Department of Religion.

Swakon v. Texas A&I University involves charges that a woman professor was not compensated equitably for doing work equivalent to that of her male counterparts.

McDaniel v. Southwest Texas State University was a lawsuit in which a female faculty member charged that she was paid approximately \$300 less per month than similarly situated male professors. The case has been settled.

The Restoration of Title IX

The Project on the Status and Education of Women, Association of American Colleges, now has available a paper called "The Restoration of Title IX: Implications for Higher Education." Copies may be ordered prepaid for \$5 from PSEW/AAC, 1818 R St., NW, Washington, DC 20009. Bulk rates are available.

The Civil Rights Restoration Act of 1987 was enacted by Congress over presidential veto on March 22, 1988. This overturned the Supreme Court's *Grove City* decision and restored "Title IX coverage so that once again it applies to the entire institution regardless of where federal funds are utilized." The 13-page booklet "is designed to help institutions understand the restoration of Title IX and changes resulting from the Civil Rights Restoration Act."

The booklet achieves its aims well. Sections are: Summary, Which Institutions Are Covered?, What Are the Exemptions?, Affirmative and Remedial Action, What Constitutes Discrimination?, How Are Students to be Treated?, How Are Employees to be Treated?, A Partial List of Actions Institutions Must Take, Single-Sex Organizations and Programs, Appendix: Title IX and Athletics, and Notes.

New York Sex Discrimination Suit Won

New York began using the Scholastic Aptitude Test (SAT) as the sole instrument for determining winners of Empire State and Regents College Scholarships about ten years ago. Nearly three-fourths of the awards went to boys under these rules. When in 1988 the awards were based half on the SAT and half on high school achievement, sex bias was substantially reduced. This year, the state legislature did not renew the reform legislation, so the SAT-only method was due to be used again.

A suit was filed in October, 1988, on behalf of ten female high school seniors, NOW-New York State, and the Girls Clubs of America, Inc. The ACLU's Women's Rights Project and the New York CLU provided counsel, with *pro bono* assistance provided by the New York law firm of Stroock & Stroock & Lavan.

from "Awards Favor Boys, Court Rules" by Isabelle Katz Pinzler, *Civil Liberties*, Winter 1989, p. 6; ©1989, American Civil Liberties Union (ACLU):

Judge John M. Walker of the federal district court in Manhattan stated, in his preliminary ruling on February 3, that "SAT scores capture a student's academic achievement no more than a student's yearbook photograph captures the full range of her experiences in high school." His ruling is the first in the nation to state that the standardized tests, which are widely used and much criticized, discriminate against any group. ...

The ACLU plaintiffs based their case on two main arguments: First, because the SAT was designed to predict future, not measure past performance, it cannot be used in the latter way. Second, even if the test were a legitimate measure, the SAT discriminates against females by, among other things, underrating their academic capability compared to that of males. Studies show that a boy and girl whose SAT scores are the same and whose academic levels appear, therefore, to be equal, perform unequally in college, with the girl getting higher grades than the boy. Both the Educational Testing Service (ETS), which created the SAT, and

the College Board, which administers it, have acknowledged these limitations in the past and advised colleges not to rely exclusively on the SAT as an admissions tool.

The State of New York, by using the SAT exclusively, was disproportionately withholding scholarship money and other benefits from female students, who generally perform better than males in both high school and college when performance is measured by grades or class rank.

Educators now acknowledge that standardized tests, because of inherent cultural biases, tend to discriminate against blacks and Hispanics. During the last 25 years, such tests have been successfully challenged in courts. ... The issue is similar for young women. Tests can and do discriminate against them, crippling their opportunities.

from "Judge Finds Bias in NY Scholarship Awards," *National Now Times*, February/March 1989, p. 3; ©1989, National Organization for Women (NOW)

In a preliminary ruling, Walker, who is a Reagan appointee and a cousin of President George Bush, found that the state's exclusive use of SAT scores to award Empire and Regent Scholarships violated both Title IX and the Equal Protection clause of the U.S. Constitution. ...

Judge Walker's opinion is a preliminary injunction that came after he heard testimony for one day and reviewed extensive submitted evidence. The State could appeal the preliminary ruling; if it does not, or if it does not agree to comply, Judge Walker would then hold a full trial of the issues in the case.

The issues in this case are similar to those raised by FairTest and a coalition of 50 civil rights, feminist, education reform, and consumer groups who have called on the National Merit Scholarship Corporation to stop using the PSAT test scores as the sole qualifying criterion for its awards. ...

The American College Testing Program has announced a major change for the ACT that appears to only exacerbate the sex bias in the test. The test will now include an expanded mathematics section and a separate science section. In response, the Educational Testing Service, makers of the more widely used SAT, has announced a review of their test.

NJ Sex Discrimination?

The New Jersey Chapter of AWM sends the unhappy news that three women in mathematics and computer science in the New Jersey State College system have been refused tenure by their administrations this year although they were recommended for tenure by their departments. Of the seven up for tenure in math/CS, only three men were approved by the administration. There is some difference of opinion as to whether or not the problem is anti-woman or anti-mathematician. Obviously it is a bad situation, whatever the underlying causes.

The NJ Chapter organized a petition drive which was held in February. Hopefully it will help prevent the recurrence of such problems.

THE ELEANOR ROOSEVELT FUND

To meet the choices and challenges of the twenty-first century, the American Association of University Women (AAUW) Educational Foundation has established a new program, the Eleanor Roosevelt Fund for Women and Girls: Intergenerational Partnerships. That effort, launched in June 1988 at the Foundation's Centennial Gala, will extend and expand the mission of the current fellowship programs and provide a new vehicle for responding to the needs of today's women and girls. It is designed to have a practical impact on the way we teach, learn, and serve in tomorrow's communities.

The Fund will support research and action projects that address the following three broad focus areas: identification and removal of barriers to women's and girls' education; promotion of the value of diversity and cross-cultural communication; and development of greater understanding of the ways women and girls think, work, and play.

The Foundation is establishing a research advisory panel composed of educators, policy-makers, and scholars to advise on research to be funded and to assist in the selection of researchers. The new knowledge developed by the Eleanor Roosevelt Fund will inform the activities of AAUW's grassroots affiliates throughout the United States and others interested in the needs of women and girls.

The first program to be initiated under the Fund will be Teacher Sabbaticals for teachers of grades K-12. The program aims to improve the teaching of girls of diverse backgrounds, particularly in math and science education. While these fields are vitally important in an increasingly

technological world, girls' enrollment and achievement in these disciplines continue to lag behind that of boys, and there are comparatively few women scientists and engineers in society at large. Through the Teacher Sabbatical Program, the Fund will award sabbatical fellowships for developing instructional skills, knowledge and materials which can lead to a learning environment supportive of girls' educational aspirations, achievement and preparation for tomorrow's world.

Sabbaticals will be awarded on a competitive basis to teachers from schools in each region of the United States. They will emphasize the practical application of theory and provide hands-on experience. In addition to formal study, participating teachers may undertake internships, for example, in science museums and in educational institutes.

The program will take advantage of the educational commitment and expertise that reside in the AAUW membership by seeking members' active participation in selection and follow-up. Local AAUW affiliates will help identify prospective candidates and support sabbatical fellows upon their return to the school system.

Foundation guidelines for the sabbatical fellowships will be issued in Spring, 1989. The first 10-20 sabbatical fellows will be selected by December, 1989.

The 150,000-member Association is also developing complementary local and national activities that emphasize intergenerational partnerships and represent an effort to expand the definition of "community." The new program initiative is called "Choices for Tomorrow's Women." Thus, a working alliance will be forged between the Foundation and its parent Association that will give grassroots volunteers a way to respond effectively to a range of complex twenty-first century issues.

For further information about the Eleanor Roosevelt Fund, write to the AAUW Educational Foundation, 2401 Virginia Avenue, N.W., Washington, DC 20037.

DAUGHTERS DISCOURAGED IN SCIENCE

from University Briefs, *The Scientist*, February 6, 1989, p. 4

Why are most fields of science still predominantly male? One key reason may be parents' attitudes. According to studies by University of Colorado psychologist Jacquelynne Eccles, boys are more likely to receive encouragement from their parents to learn science and math than are girls. In addition, Eccles discovered, parents consistently exaggerate boys' strengths in science and math and underestimate girls' capabilities. The power of such attitudes should not be underestimated, says Eccles: "The parents' perception of their kid's ability has a bigger impact on the child's self-image, confidence in math, and subsequent course enrollment than the kid's own grades."

ON CAMPUS WITH WOMEN

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

Spring 1988

Bringing Computers into the Liberal Arts

Mills College, a liberal arts college for women, is offering an interdisciplinary Master of Arts program in Computer Science (ICS) that allows people with a liberal arts background to apply computer technology to their area of expertise or interest.

In the first year of the program, students concentrate on math and computer science courses. In their second year, they take courses related to their liberal arts emphasis and complete a thesis or project that integrates their theoretical knowledge of computing with their area of interest. Internship opportunities are available to students in the program at companies such as Apple Computer and IBM. The program also offers a twenty-four-hour academic computer center equipped with forty-eight terminals for students' use. For further information, contact Pat Lordan, ICS Coordinator, Mills College, 5000 MacArthur Blvd., Oakland, CA 94613.

Overcoming Computer Anxiety

The Women's Action Alliance, in a project funded by Apple Computer, Inc., has written a brochure that discusses why girls avoid computers and offers a number of practical strategies to encourage girls to use computers more often and be comfortable doing so. Although primarily aimed at elementary and secondary teachers, the brochure will also be of interest to teacher educators and computer science faculty members. *Do Your Female Students Say "No, Thanks" to the Computer?* highlights some of the ideas and recommendations in the book *The Neuter Computer: Computers for Girls and Boys*. The brochure may only be ordered in bulk. For information on purchasing and distributing large quantities of the brochure, contact Jo Sanders, Women's Action Alliance, Inc., 370 Lexington Ave., Suite 603, New York, NY 10017.

Snappy Answers to Obnoxious Questions

Many people who have given speeches on women's studies have been asked questions that do not seek answers, but rather seek to undermine the subject and even attack the speaker. Usually speakers deal with these questions and comments in a nonconfrontational way. In a lighthearted way, Cheri Kramarae and Brinlee Kramer have listed some of these questions and given the answers they'd like to give, if only they were free to. "I Seem to Recall Hearing That Question Before" appears in *Women and Language*, Vol. 10, No. 2, page 24. Single copies are available for \$3 from *Women and Language* Subscriptions, University of Illinois at Urbana-Champaign, 244 Lincoln Hall, 702 Wright St., Urbana, IL 61801.

Making Progress Backwards

Have more women been entering science in recent years? No, according to two reports that track data from 1970 through 1986.

As of 1986, the participation of women students in science and engineering had leveled off or even declined in some areas, according to the seventh edition of *Professional Women and Minorities*. Written by Betty M. Vetter and Eleanor L. Babco and published by the Commission on Professionals in Science and Technology, the book contains numerous charts and statistics indicating:

- In 1986, fewer women were interested in engineering than in 1983. Women comprised two percent of first-year engineering students in 1970, rose to 17 percent in 1983, but dropped to 15 percent in 1986.
- The percentage of foreign nationals in engineering increased steadily between 1974 and 1986 at all levels. In 1974 they received six percent of bachelor's degrees; in 1986 they received eight percent. In 1986 they received 25 percent of master's degrees — up from 20 percent in 1974. At the doctoral level, they went from 30 percent of recipients in 1974 to 39 percent in 1986. The percentage of American nationals, men and women, enrolled in engineering programs has been affected by the growing enrollment of foreign students.
- In most fields of science, the percentage of women and minorities with a bachelor's degree has decreased or remained the same in recent years. For example, women comprised 11 percent of graduates in geological sciences in 1971, 25 percent in 1980, and then declined to 24 percent in 1986. In 1977 women earned 35 percent of the master's degrees in mathematics, the same percentage as in 1986. Even in computer science, the percentage of women earning bachelor's degrees decreased from 37 percent in 1984 to 35.6 percent in 1986. Although there were some small increases in the percentage of women in the biological sciences, the rapid increases of the 1970s apparently have ended, according to Vetter and Babco. Psychology is the only scientific field in which women receive more than half the doctoral degrees awarded.
- At the doctoral level, the number of all American Ph.D. recipients in science and engineering dropped 6.6 percent between 1975 and 1985 despite a 68 percent increase in the number of American women earning such degrees. This decline is a result of a 23 percent decline in the number of white American males earning doctorates in these fields.

The 264-page report also contains information on participation rates of women and minorities in other professional fields such as business, law, medicine, and pharmacy. Copies of the book are available for \$85 from the Commission on Professionals in Science and Technology, 1500 Massachusetts Ave., NW, Suite 831, Washington, DC 20005.

By 1984, women comprised only 20 percent of full-time faculty, postdoctoral students, and other professional employees in science, according to "Academic Women in Science 1977-1984," which appeared in the January/February 1987 *Academe*. Author Lois Weiss notes that these women tend to be clustered in the social sciences, psychology, and life sciences, while making up only four percent of engineering professionals, five percent of physicists, eight percent of astronomers, 18 percent of mathematicians, and 19 percent of computer science professionals.

The change from 1977 to 1984 was small even in fields in which women fared relatively well. For example, in 1984 there were only 239 more female psychologists among academic professionals than in 1977. In 1984, however, there were 1,500 more women in computer science than in 1977.

Summer 1988

Court Upholds Women's Studies Courses

The U.S. Supreme Court has declined to review a suit by several California women challenging women's studies courses at California State University-Long Beach (CSLB). In their suit, *Allen v. Board of Trustees of California State University and Colleges*, the women argued, "The state, through CSLB's women's studies faculty urged students and the public alike to support the feminist political agenda." They further claimed that the women's studies curriculum is "politically biased in favor of... feminism and lesbianism." The California Court of Appeals for the Second Appellate District in the case noted, "If the taxpayers were allowed to monitor and censor course content at universities, it is unlikely that many existing courses could be taught." It ruled that such actions would violate free speech guarantees under the First Amendment. It also noted that women's studies courses make up a small percentage of the hundreds of courses offered at the university and that students are not required to enroll in them.

Million-Dollar Day Care at SUNY

In fall 1987, officials of the State University of New York (SUNY) announced grants totalling \$1.065 million to improve and enlarge child-care operations at twenty-eight community colleges. The grants are part of a total SUNY child-care commitment of \$2.3 million, which also includes grants of \$1.246 million to go to twenty centers of the state-operated campuses later in the year. State funding and funds from student fees are major revenue sources for the centers. Other sources of funds include student governments, faculty-student associations, federal funds, U.S. Department of Agriculture nutrition funds, and the United Way.

A Feminist Approach to Teaching Science and Health

Teaching Science and Health From a Feminist Perspective, by Sue V. Rosser of the University of South Carolina, outlines a variety of sample courses in biology, health, women's studies, and science education. The guide also includes a general discussion of the content of each course, methods for presenting material, a model syllabus and reading list, supplementary readings and videotapes, and a chapter on adapting courses for use outside of the traditional classroom setting. Rosser states in the introduction that the impetus for the book "arises from a desire to unite the newfound enthusiasm of scientists and feminists with work produced over the last ten years by feminist scientists, in the hope that this union will provide the support each group needs."

Help for Women Returning to Campus

Chatham College, a liberal arts college for women, has opened a dormitory designed especially for single women returning to school after having been absent for seven years or more. The dormitory was designed with the help of architecture students from nearby Carnegie Mellon University who submitted designs to refurbish an existing dormitory to meet the needs of older women. The dormitory, which combines the best ideas from the architecture students, contains facilities for single women and single mothers with a small child.

Re-entry students are automatically enrolled in a special scholarship program in which the cost of taking courses is discounted.

For further information, contact M. Constance Sherin, Director of the Gateway Program, Chatham College, Woodland Rd., Pittsburgh, PA 15232; 412/365-1165.