

Association for Women in Mathematics

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NEWSLETTER

November-December 1984

DUES INFORMATION: There were two inadvertent omissions in the dues notice you received in August. If you are joining AWM for the first time, dues are \$10 for each of the first two years. Be a Contributing Member by paying \$20 or more in addition to your regular dues.

And if you haven't paid your dues yet, they're already overdue!

PRESIDENT'S REPORT

In the 1980's nonacademic employment for mathematics Ph.D.'s has become an increasingly attractive alternative. Only ten years ago many companies which now hire from this pool would have looked askance at someone with a doctorate, especially in pure mathematics. Recognizing that the role of mathematicians in government and industry is constantly evolving, AWM is presenting a panel on "Nonacademic Careers in Mathematics" at the annual joint meetings of the American Mathematical Society-Mathematical Association of America in Anaheim, California, January 9-13, 1985. The topic for the panel was chosen by President-Elect Linda Keen, whose term as President begins in January; the panel is being arranged by Professor Pat Kenschaft of Montclair State College. The list of speakers, which is not yet complete, will include people who have made the transition from university to industry. We hope to bring out some of the similarities and differences in the two types of employment.

I hope to see many of you in sunny California in January. Please be sure to stop by the AWM table.

Linda Preiss Rothschild
Department of Mathematics
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LETTER FROM THE EDITOR

It was a pleasant surprise to receive my free copy of The Color Purple recently--I had completely forgotten filling out a form for a textbook publisher and choosing it from a list of several as my reward. And I do feel rewarded--reading the book was a wonderful experience. I recommend it to any of you who have missed reading this 1982 Pulitzer Prize winner (by Alice Walker, published by Harcourt Brace Jovanovich).

Another recent read was Emmy Noether: A Tribute to Her Life and Work, edited by James W. Brewer and Martha K. Smith, 1981, Dekker. The articles presented an interesting mixture of biographical and mathematical information. Unlike the recent books on Kovalevskaja, this book is written primarily for a mathematical audience. However, the biographical article by Clark Kimberling, which is about 45 pages long, is accessible to a more general readership.

Recently I have received a couple of complimentary copies of New Directions for Women (108 West Palisade Ave., Englewood, NJ 07631). In case you're not on the same mailing lists that I am, I'll say a little about it. It is published bi-monthly and is \$10 for a one-year individual subscription. It is a feminist newspaper with sections on art, politics, and books; it looks pretty interesting.

I hope I'm not jinxing the printer again, but isn't this letter-quality print nice?

Anne Leggett
Department of Mathematical Sciences
Loyola University of Chicago
6525 North Sheridan Road
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ROOMMATE MATCHING SERVICE

Very few women have contacted me about finding a roommate for the annual AMS/MAA meetings. Only two women contacted me about the Louisville meeting, and I put them in touch with each other. So, if you want help in finding a roommate for Anaheim, write me. If anyone else writes me, I'll put you in touch with her. You should give me the following information: name, address, phone numbers (work and home), dates of arrival and departure, and whether you smoke.

Ruth Rebekka Struik
Math Department
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Boulder, CO 80309.

LETTERS TO THE EDITOR

To the editor:

Your decision to publish the correspondence of Professor Rosenberg attacking the operations of the American Mathematical Society without the simultaneous publication of the views of the Trustees who are fiscally responsible for the Society was, at the very least, contrary to normal publishing practice. The publication is particularly regrettable since it has all the appearance of a personal attack on Dr. LeVeque, the Executive Director, who has, like Professor Rosenberg, given devoted service to the Society. He served as Executive Editor of Mathematical Reviews in 1965 and 1966 and has served on Comm. Comm. and many other AMS and multi-organizational committees. He was on the editorial board of Math Reviews from 1976-78 from which he resigned to take his present position.

These are difficult financial times, and the Trustees of the Society have many times sought advice from committees within the Society and from professional consultants. Lately, in the present matter, the executive committee has sought advice from Dr. W. T. Martin, for many years the Treasurer of the Society and from

Dr. Richard A. Leibler, formerly director of Communications Research Division of the Institute for Defense Analyses. This advice has without exception reaffirmed our confidence in the management of the Society.

Sincerely yours,

Cathleen S. Morawetz
Chairman of the Board
American Mathematical Society

Ed. note: Time constraints did not allow us to solicit a reply from the AMS prior to the publication of Rosenberg's letters. We regret any inconvenience this may have caused.

To the editor:

I am annoyed with the current trend to write about the personal lives of some 19th century women mathematicians instead of publishing their writings and classroom notes. I personally don't care who slept with whom or other trivia. I would like to read their papers and decide for myself whether or not they ought to be praised. When the male community wants to praise a man, they publish his notes and writings. They do not dwell on his personal idiosyncracies. The writers on Sonia K would spend their time better if they compiled and published a compendium of her mathematical notes, ideas and discoveries and forgot about mundane gossip. I hope the writers of the 21st century will focus their attention on the writings of women mathematicians of the 20th century and not on their personal lives. ...

I discovered by accident that 4th grade children in the Montclair Public Schools were being taught that when you divide by zero you get zero. And further that the mother of one 4th grader, who hated arithmetic with a vengeance, was taught the same in her early education. I reeducated both, and then in July, sent a letter to the Superintendent of Schools in Montclair about it ... The Superintendent, a woman, never replied to my letter. ... The girl [I taught] now likes math and is beginning this new school year in a private school in Montclair. How many other little girls out there have been taught to hate math by being taught incorrect number facts? I'd like to know. Reply to the Letters To The Editor column, please. It is little things like that that make a person mis-function in math, like a car with the wrong spark plug.

I can't find a copy of the following: Langer, R.E. Fourier's Series, The Genesis and Evolution of a Theory - Slaughter Memorial Paper 1. If anyone reading this can lend, sell, or tell me where I can get a copy, I would be extremely grateful.

...

I extend my praises to Alex Rosenberg for his noble effort to make the financial structure of the AMS efficient. Raising dues forced many people out of the Society. Academic people don't usually get more than 40 thousand dollars a year except in Canada. Perhaps the AMS could combine with other national math groups and share facilities.

Is there anyone in the northern half of New Jersey who has a Commodore 64 and would be willing to share peripherals? Is there any woman in the area who would be willing to spend an evening talking about math problems and solutions? ...

Jeanne-Marie Silk
21 Prescott Avenue
Montclair, NJ 07042

Ed. note: My example of wrongly-taught mathematics is from the high-school level rather than the elementary-school. In Illinois, some students are being taught that " $1 < x < 0$ " is correct notation. Is this a national phenomenon? Are the high-school algebra texts correct?

To the editor:

I appreciated the "Historical Note" on Mildred Lenora Sanderson in the July-August newsletter.

Readers of the Newsletter may be interested to know that the Mathematics Department at Mount Holyoke College annually awards the Mildred Sanderson Prize in Mathematics to one or more outstanding freshmen students. The award letter to the recipient(s) is always accompanied by a copy of L.E. Dickson's eloquent obituary.

The department is taking steps to increase the amount of the award. Anyone interested in making a donation is invited to contact the department.

Sincerely,

Harriet Pollatsek
Professor
Mount Holyoke College
South Hadley, MA 01075

To the editor:

Re Boston Area meeting reported in the summer Newsletter, I have taken one small step to de-emphasize the monopoly of males in the Boston Museum of Science's poster representation of its mathematical time-line exhibit. My black magic marker has neatly reduced the heading "Men of Modern Mathematics" to "Modern Mathematics."

Despite the omission of female mathematicians, I am extremely grateful to the Museum for supplying my high school with several free copies of the huge poster, and I recommend that other teachers request it for their schools.

Sincerely,

Margaret Gibes
The Williams School
New London, CT 06320

AMS STATEMENTS

These statements were received too late for inclusion in the last Newsletter.

Michael C. Reed, Professor, Duke University

Here is my response to your request for a statement concerning my candidacy for the council of the AMS. I think it is appropriate for you to ask for such statements. I hope you and your readers realize how difficult it is in these short statements not to sound pontifical, arrogant, or simple minded. In any case, here are some views that may be of interest to your readers.

I believe in strict enforcement of equal opportunity for women. I am against affirmative action for women if that means special treatment, for I believe that it is counterproductive and will lower the status of women in the long run.

Concerning recent decisions of the council, I think it is reasonable to require an abstract fee that covers the cost of publication. Further I do not think it a terrible loss to cancel the summer meeting since there are many AMS-NSF-SIAM summer conferences which provide for the exchange of information.

On one issue I would like to see the council play a much stronger role, and that is in representing research mathematics to the American public and to the government. Many sneer at such activities as being merely PR. They are, of course, PR, but they can and should be much more. Over the long term the Society should educate the public and the government about the nature and importance of mathematics. A much clearer understanding of the nature of mathematics and its applications would enable the public (at the local school board level) and the government (at the research level) to deal with the crises facing mathematics education and research today.

Carl Pomerance, Professor, University of Georgia,
currently at Bell Communications Research

I recently returned to Georgia after 3 1/2 months abroad and had to quickly collect my things for my temporary job here. Thus I hope you will forgive this late response to your request for a statement for the AWM Newsletter. Here is my statement:

It is often heard nowadays that some of the smartest students who at one time would have majored in mathematics are now choosing computer science. This situation is viewed, and rightly so, as a loss of some of the finest minds around for our discipline. It seems odd, though, that there have been few complaints from the mathematical establishment over the years that large segments of society, namely women, minorities, and the poor are grossly under-represented in the profession. This too is a great loss for mathematics and should be viewed as such.

I personally enjoy the summer AMS meetings for their smaller size and relaxed atmosphere - I would explore every method of keeping this tradition.

If dues must be raised, this could perhaps be arranged in a more equitable fashion using a tiered system based on years of membership: new members pay little, 10-year members pay more, etc.

OBITUARIES

from the New York Times, Wednesday, July 25, 1984:

Dr. Edna E. Kramer-Lassar, an author and retired professor of mathematics at the Polytechnic Institute of New York, died of pneumonia July 9 at her home in Manhattan. She was 82 years old.

Dr. Kramer-Lassar, who was known professionally [as] Dr. Edna E. Kramer, taught at the institute from 1948 until her retirement as professor emeritus in 1965. She also taught at New York University, Brooklyn College and Montclair (N.J.) State College. In 1972, she lectured at the Chinese University in Singapore.

One of her works, The Nature and Growth of Modern Mathematics, was chosen the Science Book of the Month Club offering for May 1970. Her other books included A First Course in Educational Statistics, Mathematics Takes Wings: An Aviation Supplement to Secondary Mathematics and The Main Stream of Mathematics.

She contributed to professional journals and to the Dictionary of Scientific Biography, in which her specialty was the history of women in mathematics.

She was born in Manhattan and graduated from Hunter College in 1922, first in her class. In 1930, she became the first Hunter graduate and the third woman to earn a doctorate in pure mathematics from Columbia University. She later studied at the Courant Institute of Mathematical Sciences at New York University and the University of Chicago.

She is survived by her husband, Dr. Benedict T. Lassar, and a sister, Martha Kramer of Manhattan.

M. Solveig Espelie died early in July, 1984. She was born in 1940. Her degrees were as follows: B.A., Luther College, 1962; M.A., University of Maryland, 1964; and Ph.D., University of Maryland, 1968. She was an assistant professor at the University of Cincinnati in 1968-69. Since 1969, she was on the faculty of Howard University, where she was promoted to Professor. Her fields were topology and functional analysis.

HONORS AND GRANTS

Congratulations to the following new Fellows of the American Statistical Association. The Fellows with their citations are:

Kathleen Rundle Lamborn, Research Head, Biostatistics, The Upjohn Company; for effective practice and promotion of statistics, for excellence in leadership and administrative activities involving scientific information, and for dedicated efforts to improve the organization of the Association.

Pamela M. Morse, Biometrician, Statistical Research Section, Engineering and Statistical Research Institute, Research Branch, Agriculture Canada; for extending the concepts of bioassay to current topics, for clear communications of statistical concepts in biological applications, and for scientific leadership in planning and analysis of agricultural research.

Judith Rich O'Fallon, Director, Cancer Statistics Unit, Mayo Clinic; for creative leadership in statistical consulting and data management for clinical trials, and for service to the profession and to the Association.

Dr. Marialuisa N. McAllister, professor of mathematics at Moravian College, Bethlehem, Pennsylvania, was a member of a symposium of American and Chinese research scientists which was held in Beijing, China during the period July 14-21, 1984. The meeting was jointly sponsored by CAST (Chinese Association for Science and Technology), CSEE (Chinese Society of Electrical Engineering), EPRI (Electric Power Research Institute of China), and NAFIPS (North American Fuzzy Information Processing Society). A call for papers and careful reviews of the submitted MS was the mode for selection of the American delegates whose expenses were supported by the National Science Foundation. The American visitors were billeted at the Wan Shou Lou Guest House. The symposium talks were held at the Beijing Institute of Science. There were 34 Chinese speakers and a large number of students and other faculty members from various universities in China. All papers presented at the symposium were delivered in English. The Proceedings, edited by Dr. P. Y. Wang, EPRI, and Dr. Z. Q. Cao, *Academica Sinica*, will contain a selection of papers from the symposium program. The volume, written in English, will be available in late 1985.

The hospitality afforded to the American contingent by their hosts was outstanding. The lodging was more than adequate, and every lunch and dinner seemed like a banquet. Carefully planned arrangements were made so that the American visitors had time to attend some cultural events and to see some of the many historical sights that make Beijing a truly international city: The Great Wall, The Summer Palace, The Temple of Heaven, The Forbidden City, the Ming tombs, Tien

and Mien Square, The Great Hall of the People, Chairman Mao's Tomb, the Arts and Crafts Research Institute, and the performance of the great Beijing acrobats. A quick visit to the Beijing Zoo was also included because of the famous panda!

There was considerable interest in Dr. McAllister's talk. The subject of her research was the development of a measure that characterizes globally the quality of connection in a digraph that allows for loops. Furthermore, assuming that variations in quality are possible, a partition in a finite number of classes was obtained to yield criteria for comparison of performance.

The National Science Board approved the establishment of the Research Opportunities for Women (ROW) program at its meeting on May 11, 1984. ROW provides opportunities for women scientists and engineers to undertake independent research. By supporting research grants for women who have not previously been principal investigators or who are reentering research careers, ROW responds to NSF's concern for the quality, distribution and effectiveness of the human resource base in science and engineering. ROW complements the Visiting Professorships for Women (VPW) program, which supports established women research investigators in conducting research and other career oriented activities at host institutions. Research proposals submitted for the 1985 ROW competition must be postmarked no later than Jan. 15, 1985. Information on program objectives, eligibility requirements and proposal preparation is contained in a program announcement (NSF 84-42) which may be obtained from the Program Director, Research Opportunities for Women, Division of Research Initiation and Improvement (357-7734).

THELMA ESTRIN NAMED DIRECTOR

press release

Thelma Estrin, an innovator in applying electronic and computer technology to neuroscience research and clinical medicine, has been appointed director of the UCLA Extension Department of Engineering, Science and Mathematics. Dr. Estrin, a professor in the computer science department, was also named assistant dean for continuing education in the UCLA School of Engineering and Applied Science.

She has been a consultant to private industry and government and has served on the Army Science Board and on the Board of Trustees of the Aerospace Corporation. Her engineering professional activities include participation on the Board of Directors of the the 250,000-member Institute of Electrical and Electronics Engineers (IEEE). She was elected executive vice president of the IEEE in 1982. Dr. Estrin has also been an active promoter of career opportunities for women in engineering.

Dr. Estrin returns to UCLA after a two-year tenure from 1982-84 at the National Science Foundation (NSF) in Washington, D.C. where she served as director of the Electrical, Computer and Systems Engineering Division. While at NSF she established a new program of bioengineering and research for the handicapped.

"Dr. Estrin joins us after a nationwide search, and I have no doubt that her extensive background in research, teaching and administration, and her strong commitment to continuing education, will help us sustain and enhance UCLA's outstanding reputation for continuing education in engineering and the sciences," said Leonard Freedman, dean of UCLA Extension.

The department attracts thousands of engineering and business professionals from around the world who annually enroll in more than 600 continuing education courses.

Dr. Estrin received the B.S., M.S. and Ph.D. degrees in electrical engineering from the University of Wisconsin. In the mid-1950's she was a member of the engineering team which built the first electronic computer in the Middle East at the Weizmann Institute of Science in Tel Aviv.

In 1961 she combined her interests in biomedical research and computer engineering by joining the staff of the Brain Research Institute at UCLA. She was a major participant in launching the Institute's first Data Processing Laboratory (DPL) with facilities for neuroscientists, and she was appointed director from 1970 to 1980. Dr. Estrin was among the first engineers to apply computer techniques to analyzing the electrical activity of the nervous system, and has contributed more than 50 articles on this subject to scientific and technical journals.

Because of her contributions to biomedical and computer engineering, she was named a fellow of the American Association for the Advancement of Science and the IEEE.

Her honors include the Distinguished Service Citation, University of Wisconsin, 1976; Outstanding Engineer of the Year Award, California Institute for the Advancement of Engineering, 1979; and the 1981 Achievement Award of the Society of Women Engineers.

She is an honorary member of Los Angeles Women in Business, the Association for Women in Computing and the Society of Women Engineers.

Dr. Estrin resides in West Los Angeles with her husband Gerald, a computer science professor at UCLA. She has three daughters, Margo, a physician in private practice; Judith, a vice president of engineering for Bridge Communications; and Deborah, a graduate student in electrical engineering and computer science at MIT.

PROFESSIONAL MATH EDUCATORS' PROGRAM IN THE SOVIET UNION

press release

Soviet mathematics holds an esteemed place in international education. It is an important component in elementary and secondary school curricula and has placed Soviet scientists on the forefront in many fields.

From March 8 through 25, 1985, Citizen Exchange Council invites you to meet your Soviet counterparts in their institutes and schools to discuss with them methods and aims in math education. The program will be lead by James Ware, Professor of Mathematics and Head of his Department at the University of Tennessee at Chattanooga. Mr. Ware will be assisted by a fluent Russian-speaking CEC staffer. In addition to professional meetings, the itinerary includes sightseeing excursions and free time.

The program will visit Moscow, Simferopol, Yalta, and Leningrad in the USSR, and Helsinki in Finland. This 17-day program costs only \$1625. For a detailed brochure please contact Citizen Exchange Council, 18 East 41st Street, New York, NY 10017; 212/889-7960.

AWM IN COLORADO

by Ruth Rebekka Struik, University of Colorado

For several years, I have put up an AWM table at the regional meeting of the MAA at which I've distributed AWM Newsletters and information about women's groups such as AWIS and WME. Once I tried to organize a panel discussion on ways to encourage women to take more mathematics courses (Rapid City, South Dakota, April, 1978). The panel conflicted with something that interested lots of people, so attendance wasn't too good. On another occasion I tried to organize a luncheon, but that didn't work out. So I've given up trying to do anything more than the table at the regional MAA meetings.

Several years ago, Bhama Srinivasan gave me permission to call myself an AWM representative, if the occasion was appropriate (e.g., a breakfast organized by NOW to meet with state legislators at which representatives of many women's organization were present). If I do call myself the Colorado coordinator for AWM, then it is in connection with some activity consistent with AWM purposes, e.g., encouraging women to take math courses.

A year ago I drew up a list of local women in science who would be willing to speak in secondary schools about what it is like to be a scientist. At the bottom of the list I put "This list was compiled by R. R. Struik, coordinator in Colorado for the Association for Women in Mathematics." Last year three invitations to speak in the schools resulted from this list. I am in the process of updating the list and will send it again to teachers and school administrators I know in Boulder.

In the middle of September, I attended a fund-raiser for Boulder Educational Equity Project (BEEP), a local group of citizens and teachers concerned about sex equity in the school system. Identifying myself as being from AWM, I distributed the list of women willing to speak in the school system and the MAA brochures which urge students to take plenty of math courses. I am trying to arrange for distribution of one of those brochures in the Boulder school system.

SOME ASPECTS OF SEX INEQUALITY IN SWEDEN

by Sally Lipsey, Brooklyn College

I have always admired Sweden as a land of independent women, a place where, I thought, equality of opportunity was greater than anywhere else. Several visits to Sweden and a study of the data led to a number of surprises and a more balanced view.

Swedish law mandates equality; Swedish schools teach equality. But Swedish traditions - in the family, school system, and labor market - present powerful obstacles to equality. This article (written as part of my work for the Education Committee of AWM) will describe (with some emphasis on math education) how traditions in the labor market and school system perpetuate inequality, and what the government does as an antidote.

Consider the labor market. Women have the legal right to employment in all occupations, yet the labor market is still so sex-segregated that it is sometimes described as 2 labor markets, one for males and one for females (the intersection of the 2 markets is small). A large majority of women, aged 16-64, are working, and 40% of them have "female" jobs as nurses and hospital aides, salesclerks, office workers, or cleaning personnel. The jobs that women hold (which also rank low on the wage scale) constitute only about 10% of all the available job categories, as determined by a recent inventory. [1]

The Swedes believe in "equal pay for equal work," but this is of little relevance in a sex-segregated market. To counteract this segregation, the government sets up regional employment quotas and runs pilot projects. It also subsidizes employers who train women in non-traditional fields.

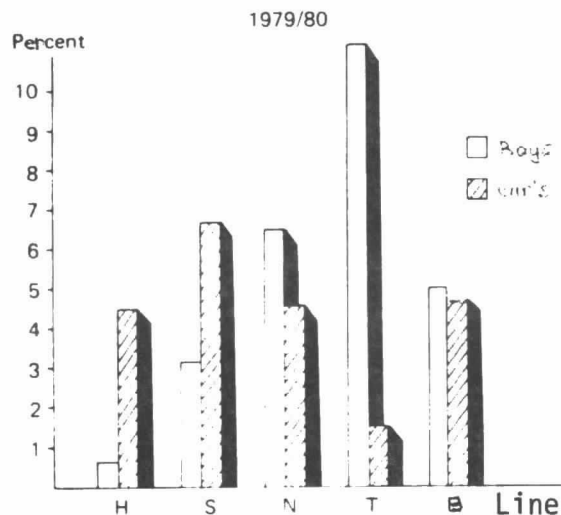
With respect to mathematics, career opportunities for women are limited. Although female math majors often become secondary school teachers, they are a small fraction (about 1/5) of the total number of math teachers. The chance that a woman will become a professor of mathematics is practically zero.

The teaching profession (especially at the elementary school level) and the rest of the public sector are more hospitable to women than the private sector, which has a reputation for sex discrimination. The government's answer to discrimination includes the Equal Opportunities Ombudsman and Commission, and the Labor Court. It should be noted, however, that if the ombudsman rules that a woman

has been refused a job because of her sex, it does not imply that she will then get the job - the guilty employer may be permitted to pay a fine instead.

Unemployment figures show that a greater percent of women are out of work than men. For instance, a 1981 survey of senior high school graduates showed that 67% of the men and 58% of the women workers had been employed continuously during the 3-year period after graduation. [2] To some extent, this is because "girls are more likely than boys to educate themselves for unemployment." [3] Although girls are just as likely as boys to enroll in senior high school, they are more likely to elect shorter courses of study and/or those that lead to the "female" jobs previously mentioned.

Why is it that the girls have such a narrow view of their career choices? One of the reasons has to do with their expectations of where they will be welcome. Another involves the traditional tracking system of the secondary school. Courses of study for each track are rigidly prescribed. Required to choose a "line" (major) by grade 10, senior high school students have less chance than Americans for experimentation and mature considerations of their talents and opportunities. It is not surprising, then, that many young women follow the old traditions. The graph below shows the main divisions of the educational system (humanities, social sciences, natural sciences, technology, and business) from which majors are chosen, with the percent of 18 year old boys and girls in each division. [4]



Although no contemplated changes in the system of tracking have been announced, an attempt has been made at the lower levels of education to acquaint students with that which is traditional for the opposite sex. Since 1980, both technology and home economics are required for all. Also, at the junior high school level, students may choose between a general math course and a special math course of greater depth. There is no special math education for unusually talented students at any level (it would be considered too elitist); there are national contests, however.

Statistics from 7th - 9th grade math courses show no significant sex differences in achievement scores or enrollment figures. About 75% of all students elect to take the more challenging of the math sequences offered. By grade 10, while achievement scores remain comparable, the number of females studying math drops to 25% of the total enrollment. [4] Young women who would like to continue their math studies in senior high school, but elect non-technical majors, as is the tradition, have no opportunity to take the math; there may be none prescribed for their major, and electives are not permitted.

To major in math, one applies for the Natural Sciences or Technical divisions; acceptance is not guaranteed. About 3 times as many men as women complete a senior high school math major. At the university level, male math majors outnumber the women by about 4 to 1. [2]

Sweden is worth watching. A modern country with high ideals, its schools are mandated to teach equality between men and women, in the family, on the labor market, and in social life in general. Innovations in child care, labor legislation, and school curricula are responsible for some progress towards the goal of equality, despite the power of old Swedish traditions. The creativity of the Swedes in meeting the challenges will provide us with new ideas for meeting our own.

References

1. "Equality Between Men and Women in Sweden." Fact Sheet 82, Swedish Institute, Stockholm, December, 1983.
2. Statistiska Centralbyrån. Statistiska meddelanden. Serie U, 1984:12.
3. "Facts and Figures about Youth in Sweden." Fact Sheet 88, Swedish Institute, Stockholm, December, 1983.
4. Åsa Murray och Robert Liljefors, Matematik i svensk skola. Skolöverstyrelsen, Stockholm, 1983.

STUDY EXPLORES WHY WOMEN DROP OUT OF SCIENCE AND MATH

by Thomas Miller '83

Reprinted from the Radcliffe Quarterly, April 1984,

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Thanks to Julia Robinson for bringing this article to our attention.

In 1981, women received only 27 percent of the nation's bachelor degrees awarded in science and mathematics, and only 17 percent of the doctorates.

In the Harvard and Radcliffe Class of '87, only half as many women as men came to college planning to major in science or math. Radcliffe Assistant Dean Norma Ware is conducting the Concentration Choice Study to find out why women who enter college intending to major in these fields often change their major to a nonscientific field by the end of freshman year.

Selected for the Concentration Choice Study were 150 men and 150 women members of the Class of 1983 who expressed interest in a science major on their applications to Harvard and Radcliffe and whose aptitude and training were similar. At the end of the freshman year, however, when these students had to declare a major, 69 percent of the men compared to only 50 percent of the women chose to major in science or math.

Dean Ware and her co-researchers Nicole Steckler '83 and Jane Leserman found that the factors that predict whether students remained with their choice of science or math as majors were different for men and women.

What seemed to be significant for men was that they had received good grades in their freshman year science courses and/or had been particularly certain of their intention to major in science early in their freshman year. For women, on the other hand, the determining factors seemed to be highly educated parents and/or outstanding scores on the math section of the Scholastic Aptitude Test. For both men and women, a significant predictor was that a science course was the course most enjoyed during the freshman year.

The researchers suggest that having highly educated parents is especially important to women science majors because such parents provide the example and the encouragement to pursue academic excellence, a factor that may be necessary for women trying to succeed in a traditionally male-dominated field. Furthermore, some highly educated parents may have less conventional ideas about the roles that women play in society, and they may be more likely to encourage their daughters to pursue

nontraditional careers. Doing well on the math section of the SAT, the researchers suggest, is a positive predictor for science concentration for women because it gives women a strong, early assurance that they can succeed in a field in which traditionally they are not expected to do well.

Dean Ware believes that the enjoyment of one's freshman science courses is a particularly significant factor. She found that 31 percent of the women, compared to 49 percent of the men, reported that a science course was the most enjoyable one in their freshman year.

The study further suggests that the men and women had similar classroom experiences in their freshman year, but that they responded to these experiences in somewhat different ways. While both men and women described their science courses as difficult, the men were more likely to blame factors outside themselves, such as the professor or the course material, while the women were more likely to blame themselves.

"The significance of high mathematics SAT scores as a predictor of choice of a science major for women and the women's relative lack of confidence, suggest that the women may have felt a need to 'prove themselves' capable of success in an area where women are still relatively scarce. They may have felt they had to be especially good to confirm that they should be taken seriously as students of science, developing extremely, perhaps even excessively, high standards for themselves as a result," said Dean Ware.

"The combination of the rigorous standards they set for themselves, self-doubt, and then their tendency to view science courses as particularly difficult and not very enjoyable, together constitute one explanation for their negative reaction to their freshman year science courses. It is not surprising that students who come into a difficult course with expectations of high performance and doubts about their ability should find that course unpleasant, and that they should feel consequently less inclined to pursue further studies in that area."

Dean Ware offers several suggestions on how educators can encourage women to stay in science: teachers and counselors can offer extra attention and reassurance to women science students; informal networks of women science students and women scientists can provide support and instill students with the feeling that, as one woman student said, they are "not strange but unique"; and teachers and counselors can help women students develop more realistic perceptions about what doing well in science means. "We hope that educators will take into consideration the 'negative socialization' that has been associated with wanting to be scientists," said Dean Ware, "so that talented students won't be discouraged from pursuing careers in science and math for the wrong reasons."

Dean Ware is presently working on a follow-up study that places more emphasis on students' specific academic experiences, particularly in science classes, and explores in more detail women's tendency to blame themselves for their perceived difficulties in the classroom.

NOT JUST FOR THE BOYS

by Joan Blackburn, member of the Women and Physics organising committee at Manchester University

Reprinted from Youth in Society, February 1984, pp. 14-15, by permission of the publication and the author. Article obtained by Bhama Srinivasan, Foreign Editor.

Two comments said it all: "It has helped me to see that physics is not a boring subject just for boys."

"The course wasn't long enough. I would have liked a week here--at least."

The speakers were both 16 year old girls, two of the 71 who had attended a 3 1/2 day residential school in the Physics Department at the University of

Manchester last summer. Their comments came on the last day, when the girls were tempted into making criticisms for the benefit of those coming after.

First held in the summer of 1982, the school was an experimental attempt to break the stereotyped view that so many girls have of themselves as not being able to cope with maths and the hard sciences. Professor John Willmott, head of the Physics Department, was worried by the small number of girls pursuing science subjects even as far as A-level. After consultation with Dr. Alison Kelly of the Department of Sociology, who has made an extensive study of the reasons why girls drop science subjects at school, he decided to aim specifically at girls who had sat their O-levels in the weeks immediately preceding the course.

Awareness

Ideally the concept of studying science should be introduced at a much earlier age, but realistically a university department would have difficulty in adapting relevant subject matter to minds less mature than those of O-level students.

It was decided that the prime aim of the course would not be to teach physics, but to open the eyes of the students to the great range of physical knowledge, enquiry and application of the subject. In particular, a deliberate attempt was made to attract girls who were genuinely undecided about the A-levels they would take.

A basic format was evolved of six lectures on two themes relevant to life in the modern world, with accompanying tutorials and laboratory sessions.

The girls were placed in tutorial groups of five, and since in most cases there was only one girl from any one school, new friendships quickly developed. For some it was the first time they had been in a group of girls who all had scientific interests.

Role models were considered a vitally important point of the scheme, and undergraduate, postgraduate and visiting women scientists were pressed into service to help the two women research associates from the Department, to leaven the otherwise totally male staff.

Every day there were two tutorial sessions and the afternoons were devoted to work in the labs, where the emphasis was on the girls handling the equipment and doing experiments for themselves. Thermometers were made from liquid crystals (something to take home and amaze), electronic circuits were put together, and in the third laboratory the girls were given a chance to work with complicated apparatus.

After dinner at the hall of residence where the girls stayed, the excitement continued. On the first evening there was a talk by Sir Bernard Lovell, on the second a visit to Jodrell Bank; the third evening was occupied by a 'Career Panel'. Here women in different scientific occupations talked briefly about themselves and answered questions, before the deafening sounds of a disco drove staff from the doors.

The enthusiasm of the girls was totally disarming and infectious; for three days the Department rocked under their impact.

As a result of this pilot scheme the Equal Opportunities Commission became interested. After some discussion it agreed to fund the course for two years, provided two other universities would arrange similar courses. Glasgow and Sussex agreed to do so, and last year there were three highly successful courses in the country, courses which could have been filled five times over.

Enthusiasm

The girls were selected on the basis of references supplied by their teachers. Indeed, we insisted that all the applications were sent in by the teachers, since there were many excellent applicants in both years who had to be rejected because of the large response. The number and high quality of the applicants, as well as the enthusiasm of those who attended, show clearly that there is a need for courses of this kind, to lift the subject onto a different plane from mere exam material and relate it to the real world as the girls experience it.

The reactions and comments of the girls we have met during the two courses at Manchester suggest there is a great reservoir of enthusiasm and ability to be tapped, if only the girls' initial diffidence can be overcome.

The question is how best to tap this reservoir. Schools are hampered by a shortage of equipment and teachers, and courses like ours can only reach a tiny fraction of the girls.

We are trying to ease this situation by making a video tape which will be available for distribution to secondary schools through the Equal Opportunities Commission, probably early this year. This will contain interviews with some of the girls at last year's course, and scenes of women scientists at work, filmed in the research labs of GEC.

However, all this effort is largely aimed at 15-16 year olds, and there is a great need for schemes to encourage younger girls to continue with science at least to O-level. Fortunately, there is increasing effort in this area too.

We hope to continue our residential course for a few years after we reach the end of our grant. This will depend partly on whether we can obtain funding, partly on the stamina of our staff, for whom it means an enormous expenditure of time and effort--enthusiastically and willingly given, but nevertheless exhausting.

FUTURES UNLIMITED

press release

BACKGROUND

Inspired by the success of the Expanding Your Horizons in Science and Mathematics conferences in California, six Futures Unlimited conferences were conducted by the Consortium for Educational Equity, Kilmer Campus of the State University of New Jersey, Rutgers, New Brunswick, NJ, in 1981-83. Recent reports indicate that the education of American students in science and mathematics has reached a deplorable state, and that the decline in scientific literacy may ultimately compromise our nation's ability to compete in the international arena.

Although all students are dropping out of math and science early in high school, and achievement scores have been declining for more than a decade, female students are less likely to take advanced mathematics courses than males. In fact, in New Jersey one-third more males than females take four years of high school mathematics. Attempts to correct this imbalance must be made early.

As Sue E. Berryman stated in her report to the Rockefeller Foundation in November 1983, the scientific/mathematical pool from which quantitative Ph.D. graduates ultimately derive first appears in elementary school. It emerges strongly prior to grade nine and is complete by grade twelve.

Although the talent pool seems to reach its maximum size prior to senior high school, some migration into the pool continues to occur during grades nine through twelve. However, after high school, migration is almost entirely out of, not into, the pool. As a consequence, those who obtain quantitative doctorates or have mathematically-oriented careers a decade after high school come overwhelmingly from the group who, in grade twelve, had scientific and mathematical career interests and high mathematical achievement scores.

Before grade nine, differences in scientific orientation and career expectation have little relation to the level of mathematical and science achievement. By grade twelve, however, these achievements clearly differentiate those who plan college from those who do not and those who plan quantitative college majors from those who plan non-quantitative ones.

CONFERENCE DESIGN

The Futures Unlimited program was designed to address this problem. These full-day conferences brought together 50 to 150 middle and secondary school

educators, post-secondary personnel and representatives from New Jersey industry and labor to prepare students to aspire to, and to qualify for, math-based business, technological, scientific, and professional careers; an immediate objective is to encourage students to take four years of high school mathematics, or as much mathematics as they are capable of.

Each conference was designed to provide role models and hands-on lab experiences in math/science, skilled trades, technologies, and computers to 200 to 500 students to stimulate interest in a wide range of career choices. The problem that many students avoid math and/or science because of anxiety or because of preconceived notions of traditional sex roles was also explored. The educator sessions for guidance counselors and teachers who accompanied the students introduced a needed component for in-service teacher education to provide pedagogic approaches to increase proficiency in math, science, and the technologies.

In 1981-83, 2700 female students in grades seven through twelve, and more than 600 teachers and guidance counselors attended these conferences funded by the New Jersey State Department of Education and by the U.S. Department of Education at six New Jersey colleges.

Many who requested admission, however, could not be served. Interest was so great that hundreds of students representing scores of school districts had their applications returned, due to limited capacity, weeks before the registration deadline. As many as 8000 students were told they could not attend, after enrollment was already full. Clearly, these conferences are responding to an important but unmet need.

FUTURES UNLIMITED VIDEOTAPES

To meet this unprecedented demand, a thirty-minute videotape was produced focusing on six New Jersey women in math- and science-based careers who had participated as role models in the Futures Unlimited conference at Douglass College in March 1983. [See press release in Sept.-Oct. Newsletter.]

The Rutgers Office of Radio and Television taped portions of the Douglass conference and then focused on six individuals at their places of work: AT&T Bell Laboratories, Ortho Pharmaceuticals, New Jersey Bell, People Express Airlines, Public Service Electric and Gas, and University of Medicine and Dentistry of New Jersey/Rutgers Medical School. The content and technical quality of this first videotape are outstanding, and a parallel production is planned to focus on women working in the technologies and skilled trades. The result will be two powerful career education productions demonstrating the critical connection between mathematics and future careers in the sciences, technologies, business, and the professions.

AWARDS

These conferences have received awards for excellence by the Northeast Network for Curriculum Coordination in 1982 and have been cited as a successful equity intervention program by the National Council of Teachers of Mathematics in 1983.

For further information contact: Arlene S. Chasek, Futures Unlimited Project Director, (201) 932-2071/2072.

CALL FOR PAPERS

The Women's Research Institute of Hartford College for Women is an interdisciplinary center for feminist research. It will sponsor a one-day interdisciplinary research forum in April, 1985. The Call for Papers became available October 1, with the abstract deadline in early February. For a copy write to Sharon Toffey Shepela, Ph.D., Director, Women's Research Institute, Hartford College for Women, 50 Elizabeth St., Hartford, CT 06105. (203)236-5838.

ON CAMPUS WITH WOMEN

reprinted from the spring and summer 1984 issues of the publication of the same name published by the Project on the Status and Education of Women, Association of American Colleges, 1818 R St., NW, Washington, DC 20009

Shoptalk: Men and Women Speak A Different Language

Clashes between men and women in the workplace could be reduced if each sex understood how the other is taught to communicate, says a University of Minnesota speech-communication professor.

"Male and female differences are often intercultural differences--they are taught to value different things," said professor Jerie McArthur. "Women are socialized to believe that relationships are the most important things in the world, whereas men are socialized to believe that power and ability are the most important things," said McArthur, who explained that this basic difference has a great impact on communication differences between the sexes.

Speaking up at a meeting or in class is one area where men and women traditionally differ, said McArthur. Men engage in what McArthur calls "competitive turntaking"--that is, they get their chance to speak by interrupting. Women, on the other hand, are usually trained at an early age that to interrupt is impolite. They may sit through hours of meetings or classes waiting for their chance to talk, while their male colleagues wonder if they'll ever have anything to say.

Wording of statements is another area in which the styles of men and women differ, said McArthur. Women make indirect statements, men make direct statements, and it's the latter that people tend to remember, the speech professor noted. "A woman might say at a meeting, 'Don't you think it would be better to send them that report first?' and a man could agree, saying, 'Yes, it would be better to send that report first.' The group will remember the idea as the man's because the woman never really claimed it," McArthur explained.

Men's tendency to use military and sports metaphors in their work language is another communication difference between the sexes, one that can cause women to feel uncomfortable or confused, said McArthur. When men use expressions like, "The ball's in your court" or launch into long war stories to illustrate a point, women may not always understand the function these stories and metaphors fill and can become impatient and disapproving, which, in turn, makes the men feel uncomfortable with them, McArthur explained.

"It is critical for women in the workplace to at least understand the male culture, because that is the dominant culture," said McArthur, adding that learning a language is only the first step toward understanding a culture. "For the non-dominant culture, knowing and understanding the dominant one is sometimes a matter of survival."

Despite her insistence that women in the workplace must understand the male culture, McArthur said that the ideal would be a blend of male and female values and styles. "I would like people to be more flexible and situational," said McArthur. "It's important to cooperate as well as to compete--a good leader will use what works in a given situation with a given person and not be rigid about adhering to a certain style."

Just as men and women should recognize their cultural differences, said McArthur, so too should they recognize that these differences do not exist in each member of that sex. "When I talk about these communication differences, I'm talking about males and females in society as a whole," McArthur cautioned. "Obviously there are many individuals who were not socialized in these ways."

\$230,000 Settlement in New Jersey Harassment Suit

Midway through the trial of a suit charging the school with sexual harassment and a systematic pattern of discrimination against women in hiring, salaries and tenure, Ramapo College (NJ) offered a \$230,000 out-of-court settlement; the plaintiff, Judith Zola, a biology professor, accepted. The agreement included the

placing of a letter of recommendation in Zola's file, but also stipulated that the defendants admit no liability or wrongdoing. Named in the suit was Jack Waldman, Assistant Vice-President for Academic Affairs, who, Zola reports, propositioned her when she went to him to press a claim for the reinstatement of her seniority rights which were jeopardized by a maternity leave. When she declined, Waldman requested that she arrange dates for him with other women, preferably well-to-do friends. Rather than respond to the charges against him, Waldman resigned. Zola, who did not receive tenure, now works outside of academe as a medical writer.

Women Get Less Financial Aid Than Men

While women college students tend to need more student aid than their male counterparts, they typically do not get it, according to a draft study done at the National Commission on Student Financial Assistance on problems faced by women in financing a college education. During the 1981-82 academic year, women obtained only 72 cents in grant money for every dollar in grants to men, and earned only 68 cents for every dollar earned by their male peers; they also borrowed 84 cents for every dollar borrowed by men. The report, based on data from the National Center for Education Statistics, found women are more likely to enroll part-time than men, which keeps them from being eligible for some federal student aid programs available only to full-time students. Only ten percent of an institution's campus-based student aid monies can be channeled to students attending part-time, and this is at the school's discretion. One of the report's recommendations is that at least half of the campus-based funds be allocated to students enrolled less than half-time.

"Women are twice as likely as men to be classified as independent students (66 percent compared with 34 percent) and have greater unmet need, and therefore are more likely to drop out," according to researcher Mary Moran. While women participate at a higher rate in the Pell Grant program, (25.5 percent compared with 22.8 percent for men), they receive awards averaging \$880 in comparison to a \$913 average award for men.

For information on ordering copies of the report, write to the American Council on Education, Division of Policy Analysis and Research, One Dupont Circle, Suite 800, Washington, DC 20036.

Pay Differential Between Men and Women: Even Wider Now

The earnings of white women entering the job market lagged further behind the earnings of comparable white men in 1980 than they did in 1970. A new study of census data suggests that raising women to wage equality will be more difficult than expected. In 1980, the average wage for white women was \$4.20/hour, or 83 percent of the average wage (of \$5.04/hour) paid to white men, while in 1970, white women earned 86 percent of the average wages paid white men.

In contrast, the status of black entrants to the labor force of both sexes was better in relation to that of whites in 1980 than a decade earlier, indicating progress in bringing blacks to wage equality. Black women who entered the labor force in 1980 earned \$3.99/hour, in comparison to \$4.45/hour for black men. Black women's earnings marked 79 percent of the white male wage, up slightly from 77 percent in 1970. (All dollar figures were adjusted to account for inflation.)

"The wage gap is much narrower when people enter the labor force," said the census bureau official responsible for the study, but after they have worked for ten years, it approaches what the wage gap is for the entire labor force. The same was true for the wage disparity between white men and black women. While the white women entering the labor force in 1970 averaged 86 percent of the earnings paid to their male counterparts, in 1980, this same group of women, with up to ten years of work experience, was earning \$5.79/hour, or only 68 percent of the \$8.54/hour earned by white men.

Another group of researchers reported that as much as 17 percent of the wage disparity between white men and women entering the labor force in 1980 could be accounted for by discrimination--almost twice the amount of the wage gap attributable to discrimination in 1970.

Trailing in the Top Ranks: Women's Salaries in Academe

In the top three professorial ranks combined, women earned an average of 19 percent less than their male colleagues in academic 1982-83, according to salary data collected from over 2,700 colleges and universities by the National Center for Education Statistics. The data showed that the higher the rank, the greater was the gap between the earnings of male and female faculty members.

More Women are College Presidents Than Ever Before

The number of women college presidents has increased more than 70 percent in the past eight years, according to a recent study done by the Office for Women in Higher Education of the American Council on Education. Today, women hold 254 (9%) of the top executive positions on campuses, up from 148 in 1975. The findings are based on data collected from 2,800 institutions.

The typical female chief executive officer heads a small, private, co-educational, four-year institution. Three-fourths of the women head colleges with enrollments under 3,000 students.

Only 22 women college presidents are from minority groups. Thirteen are Black, eight are Hispanic and one is of Asian Pacific descent. (Seven of the eight Hispanics head branch campuses in Puerto Rico.)

According to the study, a popular misconception has been that most women's colleges were headed by women. Until recently, however, this was not the case. In 1975, women were in charge of less than half of all women's colleges; today, women head 77 percent of these schools. For more information, contact the Office of Women in Higher Education, ACE, One Dupont Circle, Washington, DC 20036.

Update: Civil Rights Act of 1984

The U.S. House of Representatives has overwhelmingly approved the Civil Rights Act of 1984, a measure designed to reverse the U.S. Supreme Court's decision in Grove City v. Bell. (For an in-depth analysis of the effect the Grove City decision will have on women and girls in education, see On Campus With Women, Spring 1984, pp. 1-4.) The measure, passed by a vote of 375 to 32, would allow Title IX of the 1972 Education Amendments, Title VI of the 1964 Civil Rights Act, Section 504 of the 1973 Rehabilitation Act, and the Age Discrimination Act of 1975 to be enforced throughout an education institution, rather than only in the specific program or activity that receives federal funds. The Civil Rights Act of 1984 replaces the program or activity language in the four statutes with "recipient" to ensure broad, institutionwide coverage.

A similar bill now in committee in the Senate faces stiffer opposition. Opponents, both in the Senate and in the Reagan Administration, claim the legislation is too vague and could be interpreted to expand the reach of civil rights statutes beyond the pre-Grove City coverage. Sponsors point out that the bill would do nothing more than to restore the law to what it was before the Supreme Court decision. A group of conservative senators are expected to try to dilute the measure or hold up its consideration.

Organizations dealing with discrimination based on sex, race, ethnic origin, handicap and age are urging people to contact their Senators.

Cornell: Four Women Faculty Members Lose Sex-Bias Suit

Broadly defending the complex process used by colleges and universities in making tenure decisions, an appellate court ruled against four former professors who filed suit against Cornell University (NY) for sex discrimination in tenure and promotion issues. Irregularities in the procedures used in their tenure decisions, as well as statistical evidence, claimed the plaintiffs, showed that they had been discriminated against and that women were not as likely as men to be granted tenure at Cornell. Statistics presented by the women showed that between 1975 and 1979, 42 percent of the female candidates (8 of 19 women) were given tenure, as compared to 65 percent of the male candidates (47 of 72 men). Judge Ralph K. Winter (a former tenured member of the law faculty at Yale University) stated that even if the data showed that some women were discriminated against, "such data would not be

sufficient to prove that the particular plaintiffs were among the women who were not treated neutrally." The case was decided by the U.S. Court of Appeals for the Second Circuit in February 1984.

Women in Science and Math

Who Will Do Science? is a special report to the Rockefeller Foundation on women and minorities in science and mathematics. Researcher Sue E. Berryman of the Rand Corporation found the increases in the number of science degrees earned by women are due entirely to higher numbers of women participating in higher education rather than a higher percentage choosing to study science. Additionally, the greatest attrition rate from science occurs for women at the Ph.D. level.

Noting that high school mathematics preparation is a prerequisite for subsequent science study, Berryman found little difference between the sexes in mathematics achievement in the ninth grade. However, girls' choice of fewer mathematics electives, she points out, translates into lower twelfth-grade mathematics achievement, fewer women choosing college science majors, and fewer women science Ph.D.'s.

Copies of the 124-page report are available without charge from the Rockefeller Foundation, 1133 Avenue of the Americas, New York, NY 10036.

Less Than Equal: Women in Electrical and Electronics Engineering

A recently released survey of women in the Institute of Electrical and Electronics Engineers (IEEE) shows that a woman in the field of electrical engineering with qualifications and experience equal to those of her male counterpart earns about \$2,600 less per year than he does. Male engineers younger than 30 earn close to \$3,700 more than women, revealed the report; over half of the 1,816 women who are members of IEEE are less than 30 years old. In the 30-39 year old age group, the salary gap widens to \$5,025, and in the 40-49 year old group, to \$8,300. With adjustment of data for such factors as years of experience, educational level and degree of professional responsibility, the average salary difference per year comes to about \$2,600.

With respect to formal recognition of accomplishments, a majority of the women surveyed maintained that they were treated equally with male colleagues. But over half of the respondents reported unequal treatment in inclusion in informal work-related social activities, and acceptance by colleagues of professional decisions. While 61 percent of the women saw no sex bias in terms of assignment to interesting projects, 55 percent felt they were not receiving equivalent preparation for top-level careers.

Copies of the report, Profile of IEEE Women Members: Their Salaries, Demographics, Attitudes Toward the Work Place, and Professional Status, are available at \$20 for members and \$45 for non-members from the IEEE Service Center, Publications Sales Dept. 445, Hoes Lane, Piscataway, NJ 08854. Order No. UH01-60-2.

Report on Women and Minorities in Science and Engineering

The January 1984 edition of Women and Minorities in Science and Engineering provides a comprehensive statistical overview of the participation of women and minorities in science and engineering employment and training. Mandated by Congress, this second biennial report notes:

- * women holding science and engineering degrees have higher rates of unemployment and lower average salaries than their male counterparts;
- * the unemployment rate for women was 4.3 percent as compared to two percent for men;
- * tenure or tenure-track positions were less often held by women than by men;
- * salaries for women averaged close to 80 percent of men's--about the same differential as in 1972;

- * the salary gap is narrower between younger scientists and engineers than among older ones.

Women also had higher unemployment rates in every major field. The report suggests greater under-utilization of women (nine percent) than men (three percent) in science and engineering. Copies of the report are available free from the National Science Foundation, (NSF 84-300), Division of Science Resources Studies, Washington, DC 20550.

OF POSSIBLE INTEREST

The Annotated Guide to Women's Periodicals in the US & Canada lists over 250 publications from across the United States and Canada. Each publication is briefly reviewed by category and indexed by title and geographically. The Annotated Guide is a 52 page, perfect bound booklet. Subscriptions are \$12/ind. (2 issues), \$20/inst., & Libr., \$6.50/ind. (single copy), \$10/inst. Advertising rates available on request. Order from: Annotated Guide, c/o N.S.I.W.S., Bx. E-94, Earlham College, Richmond, IN 47374.

The Seventh Annual Convention of the National Women's Studies Association, Creating Choices Through Feminist Education, coincides with the fifteenth anniversary of the University of Washington Women Studies Program. The Convention will include interdisciplinary, cross-cultural and practical sessions on all phases of feminist education and research. The emphasis at the Convention will be on the choices created through feminist education in both the classroom and community. As in the past, the program will continue to recognize shared values and differences of race, class, age, sexual orientation and religion within NWSA's constituencies. Send inquiries to: Sydney Kaplan, Director, Women Studies Program, GN-45, University of Washington, Seattle, WA 98195.

Women's Studies. Humanities Press, 171 First Ave., Atlantic Highlands, NJ 07716.

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

REPORT OF THE TREASURER:

August, 1984

Accounting for the period June 1, 1983 to May 31, 1984

Balance, June 1, 1983 \$41,272.86

Total Assets, June 1, 1983 \$41,359.11

Note: The figure \$41,359.11 represents \$41,272.86 cash-on-hand plus 5 shares of Washington Water Power, valued at \$86.25 as of 8/27/84.

Receipts

Dues - Individuals	\$12,962.68	
Families	1,040.00	
Institutional	4,465.00	
Advertising Fees	844.00	
Contributions	1,997.00	
Interest	2,279.93	
Raytheon Grant	5,000.00	
Miscellaneous	543.93	\$29,132.54

Expenses

Wages & FICA (1)	\$8,085.36	
Newsletter (2)	5,341.70	
Dues & Fees (3)	152.00	
AWM meetings	169.26	
Operating Expenses (4)	2,125.76	
Speakers' Bureau (5)	3,955.74	
Raytheon Grants (6)	4,933.21	
Bulk Mailing Deposits (7)	520.00	
AMS meetings (8)	876.69	
Women in Math Booklet (9)	870.00	
Miscellaneous	37.54	\$27,067.26

Balance, May 31, 1984 \$43,338.14

- (1) Part-time Administrative Assistant.
- (2) Typing, postage and printing.
- (3) Conference Board of the Mathematical Sciences, Massachusetts Incorporation Fee, AMS Combined Membership List, AMS Directory.
- (4) Postage, phone, supplies & duplicating.
- (5) Wages for the Director of the Speakers' Bureau plus phone, postage and duplicating expenses.
- (6) Grants to women high school teachers to learn Pascal and/or Data Structures.
- (7) Deposits placed with the Boston Post Office against which bulk mailings of Newsletters and Dues Notices are charged.
- (8) Travel expenses & honorarium for Emmy Noether Lecturers plus AWM social events.
- (9) Printing charges.

Membership Statistics: Our mailing list totals 1460 including institutions and members in Canada and abroad.

Respectfully submitted,

Lynnell E. Stern

Lynnell E. Stern, Treasurer

Job Ads

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

University of Alabama, Birmingham. Dept of Math, University Station, Birmingham, AL 35294. Roger T. Lewis, Chmn. Tenure track positions open. Prefer applicants with research interests in dynamical systems, mathematical physics, nonlinear analysis on Riemannian manifolds, differential topology-geometry & nonlinear differential equations. Required: promising research, good teaching record & ability to interact with members of dept. Rank & salary open. Teaching load for research faculty: 2 courses per term. Fringe benefits excellent. By 1/1/85 send resume & 3 letters of recommendation to Chmn., but applications will be considered until positions are filled.

University of Alabama, University. Dept of Math, P.O.Box 1416, University, AL 35486. (1) Two assoc. professorships (to be approved). Required: excellent research & teaching. These appointees will help develop our research group & our graduate programs in applied math. Apply to Alan Hopenwasser at above address. (2) Four tenure track positions 8/16/85. Rank & salary depend on qualifications. Required: Ph.D. or equivalent. Areas of particular interest are algebra, applied math, differential equations, topology & analysis. Send 3 letters of recommendation (which address teaching & research), curriculum vitae & reprints/preprints to Alan Hopenwasser at above address.

University of Alaska, Anchorage. (1) Fall 1985 - tenure track - full-time, permanent. Ph.D in math required. Candidates finishing dissertations by 8/1985 will also be considered. Duties: teach 3 courses (9 credits) in math at undergraduate level, with service & research components also. (2) Fall 1985 - tenure track, full-time, permanent. Ph.D. in statistics or math with emphasis in Stat. required. Candidates finishing dissertations by 8/1985 will also be considered. Duties: teach 3 courses (9 credits) in applied stat. at undergraduate level, with service & research components also. By 1/31/85 send resume, transcripts & 3 letters of recommendation to Personnel Services Office, attn: Dr. Art Bukowski, Chair, Dept of Math Sciences, Univ of Alaska, Anchorage, 3211 Providence Dr, Anchorage, AK 99508.

Arizona State University. Dept of Math, Tempe, AZ 85287. J. Bustoz, Chair. Anticipated asst & assoc professorships. Possibility of professorship. Visiting Positions also expected. Send vita & 3 letters of recommendation to Chair.

California Polytechnic State University. San Luis Obispo, CA 93407. Applications and nominations are invited through 1/15/85 for position of Dean of the School of Science & Mathematics. Qualifications: doctorate in Biological Sciences, Chemistry, Mathematics, Physics, or Statistics; strong concern for academic excellence; demonstrated evidence of academic leadership; professional achievement; administrative experience; and excellence in teaching. Appt date: 8/1/85. Contact Dr. Tomlinson Fort, Jr., Provost.

San Diego State University. Dept of Math Sciences, San Diego, CA 92182. Positions in math, applied math, computer education & computer science (2). Rank open. Required: Ph.D by 9/1985, strong research background & good teaching references. Position in applied math requires experience & strong interest in mathematical modeling & expertise in some area of appl. math. Duties: teaching undergraduates & graduates, curriculum development, directing mather's research & doing one's own research. Closing date: 1/15/85. Applications received after that date will be considered if position is still open. Send vita & have 3 letters of recommendation sent to the appropriate one of Math, Appl. Math, Comp. Educ & Comp. Sci. Search Committees, Math Sciences Dept.

University of CA, Berkeley. Dept of Math, Berkeley, CA 94720. Alan Weinstein, Vice Chair for Faculty Appts. (1) Assoc or full professorship tenure track (may be available 7/1/85) in areas of algebra, analysis, applied math, foundations or geometry. Required: demonstrated substantial achievements in research & teaching. (2) Asst. professorship tenure track (may be available 7/1/85) in areas of algebra, analysis, applied math, foundations or geometry. Required: demonstrated substantial potential in research & teaching. (3) Several temporary positions (Fall, 1985) for new & recent Ph.D's of any age in fields of algebra, analysis, applied math, foundations or geometry. Term of these positions may range from 1 to 3 years. Applicants for NSF or other postdoctoral fellowships are urged to apply for these positions; combined teaching/research appts may be made for up to 3 years. For positions listed under 1 & 2 send by 1/15/85 curriculum vitae, list of publications, a few selected reprints or preprints & names of 3 references to Vice Chair. For positions listed under 3 send by 1/15/85 resume, reprints, preprints and/or thesis abstract & have 3 people send letters of recommendation to Vice Chair.

University of CA, Los Angeles. Dept of Math, Los Angeles, CA 90024. Yiannis N. Moschovakis, Chair. (1) A few Asst Professorships especially for candidates in applied math, algebraic number theory/modular forms, several complex variables & topology. Strong research & teaching background required. Will also consider outstanding candidates in other fields and/or at higher levels. Salary \$26,600 for academic year. Teaching load: 5 quarter courses per year. Also several positions for visitors & lecturers. Write to Chair. (2) Subject to administrative approval, a few adjunct Asst Professorships; 2-year appt only; strong research & teaching background, no restriction as to field. Salary \$26,600 for academic year. Teaching load: 5 quarter courses per year. Write to Chair. (3) 3 or 4 E. R. Hedrick Asst Professors. Applicants must show strong promise in research & have received the Ph.D after 1/1/84 (but may be of any age); no restrictions as to field; salary \$30,800. 3 year appt; research supplement of \$3400 first summer. Teaching load: 4 quarter courses per year, including one advanced course in candidate's field. By 1/15/85 contact Chair.

University of Delaware. Dept of Comp. & Information Services, 103 Smith Hall, Newark, DE 19716. Prof. B. F. Caviness, Chairperson. Searching for strong applicants, especially those with research expertise in artificial intelligence, languages & architectures for parallel processing, symbolic computation, graphics, data base systems, theoretical computer science, & software engineering. Required: Ph.D or its equivalent & excellence in research & teaching. Salary & rank commensurate with qualifications & experience. Send curriculum vitae & names of 3 references to Prof. Caviness. Applications will be accepted until positions are filled.

University of Colorado, Boulder. Dept of Math, Campus Box 426, Boulder, CO 80309. Asst professorships & assoc professorships (for strong candidates) fall, 1985. Prefer candidates whose research would complement those of current faculty. Salary range: \$24,000 - \$35,000. Applications due by 1/1/85 or by 3/1/85 for any positions not filled from initial group of applicants. Write to New Appointments, Dept of Math.

Florida International University. Math Science Dept, Miami, FL 33199. Dr. David Barton, Math Recruitment. Tenure track positions at all levels Jan or Aug 1985. Required: Ph.D. in math, research potential & demonstrated teaching ability. Preferred areas include harmonic analysis, algebra & mathematical logic. Send resume & 3 letters of reference to Dr. Barton.

University of Florida. Dept of Math, Gainesville, FL 32611. David A. Drake, Chair of Search & Screen Committee. Two new tenure track asst professorships 8/1985. Required: demonstrated research potential. Desirable: postdoctoral experience & research interests compatible with those of current dept members. Priority areas include algebra/combinatorics, analysis/approximation theory. Salary highly competitive. By 1/21/85 send resume, list of publications & have 3 letters of reference sent to David Drake.

University of Florida. Dept of Statistics, Gainesville, FL 32611. Two tenure track asst professorships Fall, 1985. Required: demonstrated excellence in teaching & promising research potential. Send curriculum vitae & 3 letters of reference to John G. Saw at above address.

Georgia State University. Dept of Math & Comp Sci, Univ. Plaza, Atlanta, GA 30303. Anticipated tenure track positions for mathematician, statistician & computer scientists with Ph.D's beginning 9/1985. Required: strong research potential & commitment to teaching. In math prefer fields of numerical analysis, numerical linear algebra, discrete math, linear & matrix algebra. In statistics prefer applied statistics, linear models & statistical computing. In Comp. Sci. prefer theoretical comp. sci., artificial intelligence, operating systems, software engineering, data communicators, networking & analysis of algorithms. Send application by 1/31/85, vita without birthdate, but including citizenship status, 3 letters of reference & transcripts of all graduate & undergraduate work to Chairman.

University of Hawaii. Dept of Math, Honolulu, Hawaii 96822. Prof William A. Lampe, Chmn. One tenure track Asst. or possibly Assoc. Prof. (pending position clearance), 08/15/85. Salary range: \$17,724 - \$26,568 for Asst. Prof.; \$22,380 - \$34,044 for Assoc. Prof. per year. Duties: teach 2 courses per semester & do research. Required: Ph.D. in mathematics or equivalent; commitment to good teaching; research promise. (For Assoc. Prof. - demonstrated excellence in research with a record of substantial publication.) Desirable: research interest matching or complementing UH's. To be guaranteed full consideration, application should be completed by 1/15/85. Apply to Chairman. Have 3 letters of reference sent directly to Chairman.

University of Idaho. Dept of Math & Appl Statistics, Moscow, ID 83843. James Calvert, Chmn. Two tenure track asst professorships in math. Ph.D in math required. One position requires specialization in combinatorics, graph theory, and finite group theory with interest in Turan & Ramsey theorems, & nilpotent injectors in solvable & nonsolvable groups. Demonstrated achievement in research & teaching necessary. Duties: research & teaching undergraduates & graduates through the PhD level. Send vitae, list of publications & 3 letters of reference. Recent graduates should include transcripts. Closing date: 2/1/85, then monthly until search is ended.

Southern Illinois University at Carbondale. Dept of Math, Carbondale, IL 62901. Starting 8/16/85. (1) Tenure-track, rank and area open. Preference given to candidates in Numerical Analysis; will consider all qualified applicants. Ph.D in math; demonstrated evidence of excellence in research in an area of math. Prefer evidence of teaching effectiveness. Substantial res. record required for appt at senior level. Closing date: 12/15/84. (2) Tenure track asst professor, Statistics. Required: Ph.D with strong background in mathematical statistics & broad interests in applied stat. Closing date 12/15/84. (3) Tenure track asst professor, area open. Required: Ph.D in math; demonstrated evidence of excellence in research in an area of math. Prefer evidence of teaching excellence. Closing date 12/15/84. (4) Visiting positions. Appt at the Lecturer, Visiting Asst or Visiting Assoc level depending on qualifications. Significant scholarly record required for appt at senior rank. Admission to candidacy required; Ph.D preferred. Applicant should have recommendation in teaching. Res. interests compatible with research interests of our faculty preferred. Duties: up to 12 hrs. of undergrad. math. instruction each semester & active participation in departmental res. seminars. Closing date: 2/15/85. Send application, resume & 3 letters of recommendation to Alphonse Baartmans, Chmn.

University of Illinois, Chicago. Dept of Math, Stat & Comp Sci, Box 4348, Chicago, IL 60680. Louise Hay, Head. Anticipated positions in pure math; applied math & numerical analysis; probability & statistics; computer related math & theoretical comp sci; mathematics & computer education. Required: excellent research record & ability to direct graduate students. Salary & rank commensurate with qualifications; prefer applicants with postdoctoral experience seeking a tenure track position. Send resume & have 3 letters of reference sent to Head. Possible visiting positions for one or more quarters. Send resume, letter indicating desired time period, & arrange for two letters of reference & a letter of support from a Dept member at UIC.

University of IL, Urbana-Champaign. Div. of Statistics, 1409 West Green St., Urbana, IL 61801. Prof. J. Sacks, Tel: (217) 333-2167. Two tenure track or tenured positions in statistics for 1985-86. Outstanding research accomplishments or potential required. Salary & rank commensurate with qualifications, but salary at Asst. Prof. rank will be at least \$25,000. Candidates from minority groups & women are especially encouraged to apply. By 1/15/85 send application, curriculum vitae & references to Prof. Sacks.

IN University, Purdue University, Indianapolis. Dept of Math Sciences. One or more tenure track asst professorships 8/1985. Required: Ph.D & strong research credentials. We encourage all areas of math sciences. Salaries are competitive; fringe benefits excellent. Send resumes & 3 letters of reference to Neal Rothman, Chmn, Dept of Math Sciences, IUPUI, P.O.Box 647, Indianapolis, IN 46223.

Purdue University Dept of Math. West Lafayette, IN 47907. Joseph Lipman, Acting Head. (1) Several tenure track or research asst. professorships 8/1985. Exceptional research promise & excellence in teaching required. (2) Possibly one position at assoc prof/professor level 8/1985. Excellent research credentials required. For all positions send resume & 3 letters of recommendation.

Wabash College. Math Dept., Crawfordsville, IN 47933. Prof Bonnie Gold, Acting Chmn. Seek a recent or June 1985 Ph.D in math beginning 8/1985. First 2 years will be as a Byron K. Trippet Asst Prof. Appt includes 9 mo salary & summer research stipend. Duties: 9 hrs. teaching per week. Background in applied math, statistics or comp. sci. is desirable, but more important is strong commitment to teaching & continued research. By 2/15/85 send resume & 3 letters of recommendation to Acting Chmn.

University of Iowa. Dept of Math, Iowa City, IA 52242. Robert H. Oehmke, Chmn. Tenure track, tenured positions & visiting positions at all levels for academic year 1985-86. Send application, vita & 3 letters of recommendation to Chmn. Selections begin 12/18/84 & will be based on evidence of applicants' effective teaching & research achievements & potential; instructional needs of dept; and potential for interaction with faculty at research level. Special attention will be given to applicants in differential equations.

University of Kansas. Dept of Mathematics, Lawrence, KS 66045. Charles J. Himmelberg, Chmn. (1) Several instructorships Fall, 1985. These positions are normally renewable for second & third years. Salary to be determined. Research interests should be compatible with those of Dept. Ph.D or dissertation accepted with only formalities to be completed. Send resume & dissertation abstract & have 3 letters of reference sent to Chmn. (2) Tenure track & temporary positions at all levels starting 8/16/85. Prefer fields of numerical analysis, probability, statistics, algebra & those meshing well with Dept's needs. Ph.D or dissertation accepted with only formalities to be completed. Send resume with description of research & have 3 letters of recommendation sent to Chmn. Deadline date for all jobs: 12/1/84 for first consideration, then monthly until 8/20/85.

Hood College. Dept of Math & Computer Science, Frederick, MD 21701. E. B. Chang, Chmn. One or two tenure track positions in Computer & Information Sciences. Position may begin Jan. or Aug., 1985. Rank & salary dependent on qualifications. Required: terminal degree in comp sci or math or other allied field with substantial graduate study or professional experience in comp sci. Excellence in teaching essential. Duties: teaching graduate & undergraduate comp sci courses & ability to lead existing Master's program. Send resume, application & have 3 letters of recommendation sent to Chmn.

University of Maryland. Dept of Math, College Park, MD 20742. John Osborn, Chmn. Tenure or tenure track positions 8/1985; rank & salary dependent on qualifications. Joint appts with other units are possible. Exceptionally strong research program necessary. By 2/1/85 send vita, description of current research & 3 letters of recommendation to Chmn.

Brandeis University. Dept of Math, Waltham, MA 02254. Several asst professorships in Pure Math 9/1985. Teaching load 6 hours per week. Required: Ph.D & demonstrated excellence in teaching & research. By 1/15/85 send curriculum vitae & letters of recommendation to Harold Levine, Hiring Committee Chmn.

Clark University. Dept of Math/Comp Sci, 950 Main St., Worcester, MA 01610. John F. Kennison, Chmn. Tenure track asst or assoc professorship 9/1985. Prefer Ph.D in comp sci or equivalent of a master's degree. Duties: teach advanced undergraduate courses in comp sci & research activity in artificial intelligence, computer architecture, database systems, computer graphics, parallel processes or similar area. Salary competitive, depending on qualifications. Deadline for applications is 12/10/84 and may be extended.

Williams College. Dept of Math Sciences, Williamstown, MA 01267. Anticipated opening for regular 3-yr appts starting Fall '85, plus a one term visiting appt starting Spring '85. Regular appts require Math or C.S. Ph.D. or equivalent; visiting appt must be able to teach freshman and sophomore level C.S. courses. Long term possibilities for regular appts. Closing dates: Vis. 1 Jan. '85, Reg. 1 Mar. '85. Send vita, list of publications, letters of reference to Robert M. Kozelka, Chaircreature.

Michigan State University. Dept of Math, East Lansing, MI 48824. Prof Kyung Whan Kwun, Chmn. Two postdoctoral fellowships in math. 2 year appt. Duties: teach one course each term & devote remaining time to research. These fellowships are normally offered to persons (regardless of age) who have had their doctorate less than 2 years. By 1/18/85 send resume & have 3 letters of recommendation sent to Chmn.

Michigan Technological University. Dept of Math & Comp Sciences, Houghton, MI 49931. Dr. Deborah Frank Lockhart, Acting Head. Tenure track & visiting positions in math, statistics & comp sci available 9/1985. Required: excellent teaching & commitment to research. Some 3 year instructorships may be open. Apply to Acting Head.

Michigan Technological University. Dept of Math & Comp Sciences, Houghton, MI 49931. Position of Department Head. Required: well-established reputation in research & special interest in applied math, statistics or computer science. Commitment to active teaching. Send resume & have 3 letters of recommendation sent to MACS Search Committee at above address.

University of Michigan. Dept of Math, Ann Arbor, MI 48109. (1) At least one T.H. Hildebrandt Res. Asst. Professorship. 3 year appt. Reduced teaching load. Prefer persons of any age having Ph.D. less than 2 years & those with applications completed by 1/2/85. Salary determined later; possibility for add'l income in summer. Starting date: 9/1985. (2) Four or more tenure track assoc professorships or senior asst

University of Michigan (contd)

professorships. Following areas receiving special consideration: nonlinear math, scientific computation, combinatorics, differential geometry, Lie presentation theory, harmonic analysis, probability, topology. Starting date: 9/1985. Applications considered on continuing basis.

University of Michigan-Dearborn. Dept of Math & Stat, Dearborn, MI 48128. Search Chmn, Michael Lachance. Tenure track position(s). Teaching & research in Comp. Sci. Prefer Ph.D in mathematics or other related areas with substantial background in Comp. Sci. Rank & salary depend on qualifications. Remote batch & terminal connections to the Ann Arbor campus, Amdahl 470, & on campus prime 400, & microcomputer facilities available. To apply, send resume & have 3 letters of recommendation & graduate transcripts sent. Starting dates: Jan. 7, 1985 or Sept. 1, 1985. Closing dates: Dec. 7, 1984 or until position is filled.

College of St. Catherine. Dept of Math Sciences, St. Paul, MN 55105. Three tenure track positions Fall, 1985. One position requires Ph.D. (or candidacy) in math; the second requires Ph.D (or candidacy) in math with interest in comp sci desirable; the third requires M.S. (Ph.D preferable) in comp sci. Commitment to undergraduate teaching. Rank & salary for each position dependent upon qualifications & experience. By 1/15/85 send resume, transcripts & 3 letters of recommendation to P. M. Tomsich.

Moorhead St. University. Accounting Dept., Moorhead, MN 56560. Prof George Sanderson, Search Committee Chair. Dept Chair (Assoc/Full Prof.), Fall, 1985. Rank & salary commensurate with qualifications & experience. Duties: Teaching & advising (50%) & administration (50%). Required: Earned doctorate & full time teaching experience. By 11/15/84 apply to Search Committee Chair.

University of Minnesota, Duluth. Dept of Math Sciences, Duluth, MN 55812. Two professorships 9/1/85. Rank dependent on qualifications. Competitive salary. Teach 6-8 hrs/wk in undergraduate comp sci. Conduct research in comp sci or related math. Help develop master's program in comp. sci. Required: Ph.D in comp sci (or in closely related field), documented teaching & research record in comparable position for advanced ranks. By 1/31/85 send application, resume & 3 letters of recommendation to Dr. Mark Luker.

University of Minnesota, Minneapolis. School of Mathematics, Minneapolis, MN 55455. Willard Miller, Jr., Head. (1) Several visiting positions from Lecturer to Full Professor available for 1/4 to 2 years. Required: strong research & teaching abilities. Research interests must be compatible with those of Dept. Salary competitive. Appl.date: 1/2/85. (2) One tenure track or senior position in core mathematics. Required: strong research & teaching abilities. Prefer persons able to interact with mathematicians of other fields. Salary competitive. Teaching load: 5 1/4 courses per academic year. Usual benefits. Appl. date: 1/31/85. (3) Several senior positions in large scale scientific computation as part of a University-wide interdisciplinary supercomputer institute. Outstanding research & teaching abilities required. Rank & salary negotiable. Usual benefits. Appl. date: 1/31/85.

University of Nebraska, Lincoln. Dept of Math & Stat, Lincoln, NE 68588. Several tenure track asst professorships 8/1985. Required: Ph.D with outstanding research potential & excellence in teaching. Salary competitive. Areas of interest applied math, statistics, optimization/control, algebra, analysis, differential equations, or numerical analysis. Apply to Search Committee by 3/1/85 & send vita & 3 letters of recommendation.

Bard College. Dept of Math, Annandale-on-Hudson, NY 12504. Tenure track position spring or fall of 1985. Desirable: strong commitment to undergraduate teaching coupled with expectation of continued research. Ph.D required although attractive candidates about to receive their Ph.D's in math will be considered. Although opening is for spring or fall of 1985, candidates available for only the spring semester should apply. Write to Peter Renz.

Plattsburgh St. Univ. College. Math Dept., Plattsburgh, NY 12901. Two tenure track positions 9/1985. Appts possible at all levels. Primary duty: undergraduate teaching. Ph.D in math or statistics required. Apply to Mayerlyn G. Miller, Director of Personnel/Affirmative Action, Box 181, St. Univ. College, Plattsburgh, NY 12901.

SUNY - Albany. Dept of Math & Stat, Albany, NY 12222. J. W. Jenkins, Chmn. One Malcolm F. Smiley Asst Professorship, 3 year, non renewable, postdoctoral appt, reduced teaching load. Prefer candidates whose research will interact closely with current faculty. Send resume & have 3 letters of recommendation sent to Chmn.

SUNY - Stony Brook. Dept of Applied Math & Stat, Stony Brook, NY 11794. Prof. Alan Tucker, Chmn. Expected openings at senior & junior level in operations research & statistics. Distinguished research record needed for senior positions; evidence of research potential needed for junior positions. Apply to Chmn.

Syracuse University. Dept of Math, Syracuse, NY 13210. L. J. Lardy, Chmn. Tenure track position with rank & salary to be determined by qualifications of appointee. Will consider outstanding candidates having potential for strengthening any existing research area, but prefer candidates in broad area of analysis. Required: excellence in teaching & research, especially for senior level appts. Send vita & have 3 reference letters (also a transcript if a recent Ph.D) sent to Chmn.

Union College. Dept of Math, Schenectady, NY 12308. Theodore A. Bick, Chmn. Two temporary asst professorships & one visiting one-year position. Teaching load: 2 courses per term for each of three terms. Salary is negotiable & depends on qualifications. All usual (and some unusual) benefits. Required: excellence in teaching & strong interest in scholarship. Send vita & 3 letters of reference, at least one of which discusses teaching qualifications to Chmn.

University of North Carolina, Chapel Hill. Math Dept, Chapel Hill, NC 27514. John A. Pfaltzgraff, Chmn. (1) Tenure track appts Fall, 1985 for applicants with Ph.D's and strong research programs in P.D.E; applied & computational aspects of analysis or algebra. Strong candidates in other fields may be considered. Rank & salary according to qualifications & budget conditions. By 1/10/85 send vitae, abstract of current research & 4 letters of reference to Chmn. (2) Two year, fixed term lectureship 8/1985 for applicants with Ph.D's and research programs in algebraic geometry or singularities. Dept will conduct special research year in algebraic geometry & singularities with distinguished visitors during 1985-86. By 1/31/85 send vitae, abstract of current research & 4 letters of reference to Chmn.

University of North Carolina, Greensboro. Dept of Math, Greensboro, NC 27412 Two or more positions fall, 1985: asst/assoc prof, tenure track & full prof. tenured, in Comp. Sci; teaching (mostly undergraduate), program development, & research. Qualifications: Ph.D in CS, or Ph.D in math with equivalent of MS in CS; for senior position strong research record & potential for leadership. UNC-G has a VAX 11/780 running VMS, on-campus connection to USENET through the Triangle Univ Computation Center. Send resume & 3 letters of recommendation to CS Committee, Dept of Math; inquiries to mcnc!ecsvax!bsmith.

University of Cincinnati. Dept of Math Sciences, Mail #25, Cincinnati, OH 45221. Tenure track positions in pure & applied math 9/1985. Most appts as asst prof, but more senior appts may be possible. Required: Ph.D with rigorous commitment to research & teaching. All fields complementing work being done in Dept will be considered. Send inquiries including vitae to Prof. H. P. Halpern.

Ohio State University. Dept of Math 231 W 18th Ave, Columbus, OH 43210. (1) Several positions at all ranks, both visiting & permanent effective Autumn Quarter 1985. Especially interested in candidates in areas of applied & pure math. Required: significant research accomplishments or exceptional research promise & evidence of good teaching. (2) Research instructorships in math for 1985/86. Required: Ph.D & evidence of strong research promise. For all jobs send credentials & have 3 letters of recommendation sent to Prof. Alan Woods.

Bucknell University. Dept of Math, Lewisburg, PA 17837. David S. Ray, Head. At least one position for 9/1985 in any area of math or statistics. Required: Ph.D (or nearly so), strong commitment to teaching & research. Some experience desired but not vital. Potentially tenurable. Will women & members of minority groups please apply? Send curriculum vitae, graduate transcript, 3 letters of recommendation, at least one of which must comment on teaching. Deadline: 1/31/85. Late applications may be reviewed.

Carnegie-Mellon University. Dept of Math, Schenley Park, Pittsburgh, PA 15213. George J. Fix, Head. (1) Numerical Analysis. Asst Professorship. Areas must complement those of Dept, which include numerical methods for partial differential equations with applications to fluid mechanics. Will also consider outstanding applicants in other areas. (2) Operations Research. One tenure track Asst Professorship Fall, 1985. Required: strong mathematical background & research interests in one or more of following areas: mathematical programming, applied probability, convex analysis; ability to take active part in Dept's undergraduate & graduate teaching efforts in Oper. Res. In exceptional cases appt at a higher level will be considered. (3) Logic & Discrete Math. One tenure track Asst Professorship Fall, 1985. Applicants should be able to teach courses in logic, combinatorics & graph theory which support dept's undergraduate track in computer science. In exceptional cases appt at a higher level will be considered. For all positions send resume, transcript & 3 reference letters to Head.

Haverford College. Dept of Math, Haverford, PA 19041. Yung-sheng Tai, Acting Chmn. Tenure track asst or assoc professorship for 1985/86. Research interests may be in any field of math. Required: strong commitment to teaching & research. Duties: teaching nine class hrs/wk in probability, statistics & computer science as well as courses in standard undergraduate curriculum. By 11/30/84 send curriculum vitae, statement of research interests & 3 letters of recommendation to Acting Chmn.

Indiana University of PA. Dept of Math, Indiana, PA 15705. James C. Reber, Chairperson. (1) At least one tenure track asst professorship 9/1985. Doctorate (or degree nearing completion) required. Prefer some background in applied math. (2) One tenure track asst professorship beginning 9/85 for person with doctorate (or degree nearing completion) in area of math education with an emphasis or experience in teaching math at some K-8 grade level(s). Teaching duties for all positions: 12 semester hours per semester. Send applications, transcripts & 3 letters of reference to Search Committee.

Vanderbilt University. Dept of Math, Nashville, TN 37235. R. R. Goldberg, Chmn. (1) Asst Professorship in field of topology. Initial 3 year appt, Fall, 1985 (renewable, tenure track). Required: outstanding research potential & evidence of effective teaching. Have vita & 4 letters of recommendation sent to Chmn. (2) Asst Professorship. Initial 3 year appt (renewable tenure track). Required: outstanding research potential & evidence of effective teaching. Should have specialization in some area of logic & interest in computer-related math. Have vita & 3 letters of recommendation sent to Chmn.

University of Utah. Dept of Math, Salt Lake City, UT 84112. (1) 3 or 4 non-renewable 3 year instructorships. Persons of any age receiving Ph.D's in 1984 or 1985 are eligible. Selections will be on basis of ability & potential in teaching & research. Starting salary: \$22,500. Duties: teaching 2 courses through academic year. (2) One visiting position of one year or less. Selection criteria are teaching ability & potential contribution to our research environment. (3) Two tenure track appts available. Selection based on research expertise & teaching ability. Send curriculum vitae, bibliography & 3 references to Committee on Staffing. (Instructorship applications must also include an abstract of thesis and a list of graduate courses completed or transcripts.)

Norwich University. Dept of Math/Comp Sci., Northfield, VT 05663. Ernest D. True, Chmn. Tenure track Asst Professorship 9/1985. Duties: teaching wide range of undergraduate courses to majors in math, comp. sci., engineering & business. Ph.D in math or comp. sci. preferred with interest in graph theory, geometry or numerical analysis. Emphasis is on excellent teaching. By 2/1/85 send application, vitae & 3 letters of reference to Chmn.

Marshall University. Dept of Math, Huntington, WV 25701. Charles V. Peele, Chmn. Tenure track assoc/asst professorship Fall, 1985. Required: Ph.D in math or related area. (Degrees in process should be complete by summer of 1985.) Salary negotiable. Duties: teach 11-13 credit hours per semester & other normal departmental duties. For first consideration write for application information to Dr. Steve Hatfield, Search Committee Chmn, before 12/1/84.

Late Arrivals

Stanford University. Dept of Math, Stanford, CA 94305. G. Brumfiel, Chairperson. Two or more asst professorships, Fall, 1985. Required: strong interests & ability in teaching & research. Send resume & have 3 letters of recommendation sent to above address. An evaluation of your teaching should be sent as an additional letter.

University of the Pacific. Dept of Math, Stockton, CA 95211. Tenure track mathematics-education position. Rank/salary negotiable. Required: earned doctorate. Experience with the K-12 school programs preferred though interest in pre-service teacher training sufficient. Must be committed to undergraduate mathematics in a growing program which includes mathematical and computer sciences. Research opportunities are available in the Math Resource Center. Send resume to David T. Hughes.

Kansas State University. Dept of Statistics, Dickens Hall, Manhattan, KS 66506. Dr. Arthur D. Dayton, Head. Three tenure track positions. Position #1 & #2 asst & assoc professor, 9 mos. Start 9/1985. Duties: teach undergraduate & graduate courses, publishable research & normal departmental duties. Ph.D in statistics required. Position #3 is 12 mo. asst professor. Duties are teaching, research & substantial consultation with faculty & students; publishable research & normal departmental duties. Require Ph.D in statistics received before 9/1985. By 1/31/85 send vita & have 3 letters of recommendation sent to Head.

University of Louisville. Dept of Math, Louisville, KY 40292. Dr. Michael S. Jacobson, Vice Chair. Asst or Assoc Professorship. Candidates should have active research program & interest in undergraduate & graduate (Master's & Ph.D) program development. Required: Ph.D in math. By 12/1/84 send application with vita, official transcripts & at least 3 letters of recommendation to Vice Chair.

University of New Orleans. Dept of Math, New Orleans, LA 70148. Terry Watkins, Chmn. Several tenure track asst professorships 8/1985. Commitment to teaching & research required. Also several nontenure track Instructor positions to teach remedial through soph. level. By 2/1/85 send vita & 3 letters of recommendation to Hiring Committee.

Washington University, St. Louis. Dept of Math, Box 1146, St. Louis, MO 63130. R. H. McDowell, Chmn. One or more positions Fall, 1985 subject to administrative approval. Rank & salary depend on qualifications. Required: outstanding research ability in a field represented in Dept & evidence of excellence in teaching. By 1/15/85 send application, vita & have 3 letters of reference sent to Chmn.

SUNY - Buffalo. Dept of Computer Science, 226 Bell Hall, Buffalo, NY 14260. Prof. Stuart Shapiro, Chmn. Asst professorships 9/1985. Outstanding applicants may be considered for more senior positions. Required: Ph.D in Comp Sci (or in related field with Comp. Sci. experience) & superior research ability. Specialists in following areas are especially welcome: programming languages, operating systems, computer architecture & software engineering. Potential colleagues in artificial intelligence, theory of computation & program semantics are also welcome. Send applications & names & addresses of 4 references to Chmn.

Rutgers University. Dept of Statistics, Hill Center, New Brunswick, NJ 08903. Joseph I. Naus, Chmn. (1) Senior Professorship, Fall, 1985. Required: national reputation in Statistics and a distinguished research record. Research & interest in applied stat a plus. (2) Asst Professorship for 3 year term on tenure track. Required: Ph.D prior to 12/31/85. Duties will be teaching undergraduate & graduate statistics; research leading to publications in refereed journals. At least one position will include statistical consulting with faculty & students. Send vita & 3 letters of recommendation to Chmn.

College of Charleston, Math Dept., Charleston, SC 29424. W. L. Golightly, Chmn. Three tenure track junior or senior level positions Fall, 1985. Required: Ph.D in one of math sciences, commitment to undergraduate teaching & potential for continuing research. Teaching: 12 hrs/wk; course reductions for those engaged in research. Minimum salary \$25,000. Send resume & have 3 letters of recommendation sent to Chmn.

University of Texas, San Antonio. Division of Math, Comp Sci & Systems Design, San Antonio, TX 78285. Prof. Stanley G. Wayment, Director. Several tenure track asst & assoc professorships 9/1985. Required: Ph.D for appt at rank of asst prof or above. Consideration for appt at rank of instructor will be given candidates finishing the Ph.D, with subsequent promotion to rank of asst prof upon completion of the degree. Applicants in math, comp sci, systems design or math education will be considered. Send vita to Director.

University of Vermont. Dept of Math & Stat, 16 Colchester Ave., Burlington, VT 05405. Roger L. Cooke, Chmn. One tenure track asst or assoc professorship 9/1985. Three year initial appt, two course teaching load. Ph.D & teaching experience required. Prefer candidate whose research is compatible with Dept interest: approximation theory, numerical analysis, biomath, applied D.E., control theory, operations research, number theory, group theory & combinatorics. Send resume, names of 3 references, and description of research plans to Chmn.

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