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ASSOCIATION FOR WOMEN IN MATHEMATICS

NEWSLETTER

Volume 7, Number 6 November-December 1977

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DUES! DUES! DUES! DUES! DUES! DUES! DUES! DUES! DUES! DUES! DUES!

The AWM membership year is October 1 to October 1. If you have not yet joined or have not yet renewed, please send your dues to AWM. Dues schedule and application blank are on the last page of the Newsletter. Encourage your institution to join.

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PRESIDENT'S REPORT by Lenore Blum

AWM has several events scheduled at the Joint Mathematics Meetings in Atlanta, Georgia. All will be held Saturday, January 7, 1978 in the Hyatt Regency.

executive committee	12:00	meet for lunch at AWM table
open Council meeting	5:00 - 6:00	Grecian Room
panel discussion: Black Women Mathematicians	7:30 - 8:30	Regency Ballroom
party	9:00 - ?	Essex room

Dr. Patricia Kenshaft, Montclair State College, Upper Montclair, N.J., will moderate the panel discussion. The panelists are Dr. Geraldine Darden, Hampton Institute, Hampton, Va.; Dr. Etta Falconer, Spellman College, Atlanta, Ga.; Dr. Joella Gibson, Wayne State University, Detroit, Mich.; Dr. Eleanor G. Jones, Norfolk State College, Norfolk, Va.; Prof. Eleanor Roane, Northern Virginia Community College, Alexandria, Va.; and Dr. Dolores Spikes, Southern University, Baton Rouge, La.

As always, volunteers to staff the AWM table will be welcome.

Judy Green will be giving a talk on women in math in the early years of the AMS the morning of Thursday, Jan. 5 (check schedule for time and place). Joan Birman is giving an invited AMS address "The topology of the 3-sphere", Thursday, Jan.5, 9-10 a.m. Jeanne Agnew is moderating an MAA panel discussion, "A course in applied mathematics based on problems from regional industries", Saturday, Jan. 7, 9-10 a.m. Barbara Osofsky is giving an invited MAA address, "The Serre problem concerning polynomials over a field", Sunday, Jan. 8, 10-11 a.m.

Congratulations to the newly-elected AWM executive committee members-at-large. They are Bettye Ann Case, Martha K. Smith, and Marjorie L. Stein.

CORRECTION

Anna Pell-Wheeler, an AMS colloquium lecturer in the 1920's, became Annabelle Wheeler in Pat Kenschaft's article last issue. Sorry.

AMS ELECTIONS by Alice Schafer, past president

The following individuals were elected to AMS offices in the recent election. President: Peter Lax; Vice President: Julia Robinson, George W. Whitehead; Members-at Large of the Council: Joan Birman, Lenore Blum, James Donaldson, Murray Getstenhaber, and Ronald L. Graham; Nominating Committee: R. Creighton Buck, Wendell Fleming, Barbara Osofsky, and Calvin C. Moore.

Congratulations to them! We are pleased that so many of them are members of AWM: only Peter Lax and Ronald Graham are not. Particular congratulations to AWM's President: Lenore Blum!

AMS ELECTIONS: CANDIDATES' ANSWERS TO QUESTIONS

Ronald L. Graham

1.-2. It is my impression that in spite of increased efforts in some sectors for greater participation by women and minorities in the mathematics profession, surprisingly little change is apparent yet. I think it is important to find out if this is really the case, and, if so, why.

3. It is clear that there is some connection between the "needs of society" and the current employment situation in mathematics. However, there are so many interdependent factors here that it is naive to hope for a simple answer to the question.

4.-5. No comment at present.

GRANT FOR THE SPEAKERS' BUREAU by Alice Schafer

The Executive Committee is happy to announce that it has received a grant of $1000 from the Polaroid Foundation, Inc., for support of the Speakers' Bureau. Stephanie Troyer, of the University of Hartford, is in charge of the Bureau and has been updating the list of speakers, as many of you know. I have volunteered to work with her through the Wellesley office. Our first plan is to use a part of the grant to distribute AWM's list of speakers throughout the country. With the funds remaining we plan to pay travel expenses of as many of the speakers as possible, with particular emphasis on trying to send speakers to areas which normally see few speakers.

Stephanie and I urge each of you to join the Speakers' Bureau and to send to her a list of your topics, and audiences for which appropriate. We have had several requests for speakers for high school groups. So if you have topics for these groups, please let Stephanie know. It would be helpful if you would also let her know how far from home base you are willing to travel and if you would like your travel expenses paid from the grant. Her address: Stephanie Troyer, Department of Mathematics, University of Hartford, Hartford, CT 06117.

REGIONAL MEETINGS By Alice Schafer

Judith Wason, AWM's Treasurer, arranged a meeting of AWM at the time the AMS met at Wellesley College on October 22 for its fall meeting in the Northeast. Judy led a very successful discussion with members about the contribution that AWM can make to women in high schools and in industry. Several women from both groups were present at the meeting.

At the November 12 meeting of the Association of Teachers of Mathematics in New England, held in Portland, Maine, on November 12, AWM sponsored a panel on women and mathematics. The speakers were Mary A. Cullen (Mt. Wachusset Community College, Gardner, MA), Lucy Rakov (North Newton High School, Newton, MA), Stephanie Troyer (University of Hartford, Hartford, CT) with Alice Schafer (Wellesley College, Wellesley, MA) as moderator. The Wellesley office has received many requests for the Speakers' Bureau and several requests for speakers following the Portland meeting.

From Nov. 1977 AWM Newsletter

4TH ANNUAL REPORT ON EMPLOYMENT OF WOMEN IN MATHEMATICS DEPARTMENTS

By Judy Green, AWM co-vice president
(Assistant professor, Rutgers University,
Camden, N.J. 08102)

The first report of the 1977 American Mathematical Society survey of faculty salaries appears in the October 1977 Notices of the AMS. In this report the total numbers of faculty as well as of women faculty at various ranks and types of institutions are given for the years 1976-1977 and 1977-1978. As in past years (see AWM Newsletters April 1975, January 1976 and November-December 1976) we use this information to compute the percentages of women in these categories. For women with Ph.D.'s things are looking better in the untenured ranks although much of this increase is coming from having instructors with Ph.D.'s who are presumably not on tenure track lines. To see this we also include below the data on non-tenured doctorate holding assistant professors and instructors. In connection with these figures we note that in the last five years 10.7% of the U.S. doctorates were earned by women while for the last two years the figure is 12.0%.

The subdivisions of the doctorate granting institutions are:

I	the 27 most prestigious mathematics departments in the US
II	the 38 next most prestigious mathematics departments in the US
III	the rest of the mathematics departments in the US
IV	statistics, biostatistics and biometric departments in the US
V	departments of mathematical sciences in the US not included above.

		Percentage of women on faculty		Percentage of women on faculty	
		1976-77	1977-78	1976-77	1977-78
Doctorate granting					
I	without doctorate	50.0	66.7	0	0
	with doctorate	4.2	3.9	3.2	3.2
	total	4.4	4.2	3.2	3.2
II	without doctorate	37.0	36.0	25.0	18.2
	with doctorate	3.5	4.3	3.4	3.7
	total	4.3	4.9	3.7	3.9
III	without doctorate	26.9	28.2	26.1	26.3
	with doctorate	5.4	5.3	3.8	3.7
	total	7.6	7.6	5.9	5.8
combined I, II, III					
	without doctorate	28.6	29.6	26.0	25.7
	with doctorate	4.5	4.7	3.6	3.6
	total	5.9	6.0	4.7	4.7
IV	without doctorate	26.1	16.7	25.0	22.2
	with doctorate	7.5	8.0	5.4	4.6
	total	8.4	8.4	5.9	5.1
V	without doctorate	12.9	16.7	0	0
	with doctorate	3.4	4.7	2.6	3.5
	total	3.9	5.2	2.5	3.4
VI	without doctorate	20.0	17.2	22.2	22.2
	with doctorate	2.0	2.3	1.0	0.9
	total	3.8	3.8	3.0	2.9

Masters granting				
without doctorate	25.9	25.1	20.5	19.4
with doctorate	8.1	8.5	7.5	7.6
total	13.0	12.9	11.1	10.7
Bachelor granting				
without doctorate	19.7	20.2	14.2	13.3
with doctorate	11.0	11.0	10.0	9.1
total	14.1	14.3	11.6	10.6
Four-year colleges and universities				
without doctorate	23.2	23.1	18.5	17.7
with doctorate	6.3	6.6	5.2	5.2
total	9.3	9.6	7.5	7.2

Non-tenured doctorate holding instructors and assistant professors

		1976-77			1977-78		
		total number	number of women	percentage of women	total number	number of women	percentage of women
Doctorate granting							
I	instructors	47	2	4.3	44	3	6.8
	asst. profs.	150	13	8.7	145	10	6.9
	total	197	15	7.6	189	13	6.9
II	instructors	46	3	6.5	62	7	11.3
	asst. profs.	243	8	3.3	255	12	4.7
	total	289	11	3.8	317	19	6.0
III	instructors	22	3	13.6	23	5	21.7
	asst. profs.	322	35	10.9	310	33	10.6
	total	344	38	11.0	333	38	11.4
combined I, II, III							
	instructors	115	8	7.0	129	15	11.6
	asst. profs.	715	56	7.8	710	55	7.7
	total	830	64	7.7	839	70	8.3
IV	instructors	3	1	33.3	1	1	100.
	asst. profs.	127	15	11.8	134	19	14.2
	total	130	16	12.3	135	20	14.8
V	instructors	3	0	0	2	0	0
	asst. profs.	157	10	6.4	149	12	8.1
	total	160	10	6.3	151	12	7.9
VI	instructors	2	0	0	2	1	50.0
	asst. profs.	100	6	6.0	89	6	6.7
	total	102	6	5.9	91	7	7.7
Masters granting							
	instructors	20	7	35.0	15	4	26.7
	asst. profs.	439	43	9.8	404	52	12.9
	total	459	50	10.9	419	56	13.4
Bachelor granting							
	instructors	44	8	18.2	32	4	12.5
	asst. profs.	390	51	13.1	393	60	15.3
	total	434	59	13.6	425	64	15.1
Four-year colleges and universities							
	instructors	187	24	12.8	181	25	13.8
	asst. profs	1928	181	9.4	1879	204	10.9
	total	2115	205	9.7	2060	229	11.1

DO IT YOURSELF

by Judy Roitman (Fall-Institute for Advanced Study, Princeton, N.J.; Spring-assistant professor, Deparment of Mathematics, University of Kansas, Lawrence, KA)

This is a report on a meeting of women research scientists held in Washington, D.C. this October, sponsored by AAAS and NSF, organized by the OOS. Initials will keep cropping up in this report, so here are their meanings: AAAS = American Association for the Advancement of Science; OOS = Office of Opportunities in Science (part of the AAAS); NSF = National Science Foundation; NIH = National Institute of Health; NAS = National Academy of Sciences; AWIS = Association for Women in Science; FOPW = Federation of Organizations for Professional Women; WEAL = Women's Equity Action League; AWM = us.

Who participated and how. 60 women scientists attended the conference. 20 were chosen from nominations by heads of women's science groups; 20 from a random sample of graduates from ten universities; 20 from recommendations by department heads at other chosen universities. Other women who did not take part in the conference, and a control group of men, completed the same pre-conference material as the conference participants. All had received the PhD within the last six years. Before the conference we filled out detailed questionnaires, and each wrote an essay. From these a list of concerns was devised, and about 2/3 of the conference was spent listening to people talk at us. On the last day recommendations for policy were made. "Scientists" included social scientists. Of the sixty participants, four were mathematicians and at least one a statistician.

The main reason we were there. We were data. Hence the great concern with how we were chosen, reflected in the dull paragraph above.

Two years ago a similar conference on minority women in science was held under OOS auspices. The report from that conference indicates that we can expect an excellent, sensitive report coming out of this one. The concern, sympathy, and intelligence of the OOS staff is striking. In addition, the written material should lead to several good reports from the OOS staff and others. Perhaps the essays will be published. All of this material will start coming out in January, and will be available from AAAS.

A not entirely parenthetical comment: from the head (Janet Welsh Brown) on down, all the OOS staff working with us but one were women.

Other reasons for the conference. We were there to make suggestions to the government. It was hoped that an old-girls network would develop, just like the old-boys network. It was hoped that we would be encouraged to get involved in the politics of the scientific community, maybe even in government policy. And we would learn little tricks of grantsmanship, etc. to further our own careers.

Back to the main point. A few things stood out so strongly that they deserve mention. The first is the enormous obstacles many of us overcame. The woman who left Singapore with a dollar in her pocket, a Commonwealth scholarship in her hand, and a father who wouldn't speak to her for ten years is but one of many who fought stereotypes of sex or class, active intellectual repression from teachers or family, as well as the more subtle pressures we are all familiar with. The second point is the prevalence of sexual harrassment. Much to my surprise (I thought I was the only one!) almost all of the women in my discussion group had experienced it, and many were currently fending it off. This was the one topic that few could talk coolly about.

The third point was that in this group of talented and persevering women, few had expectations of job security, and substantial numbers were seriously considering other careers (in my discussion group, nearly half).

Peripheral matters. The most useful part of the conference for me was the contact with AWIS and FOPW. AWIS has a reputation, which they are trying to overcome, as an organization of biologists. This is an accident of the way in which they started. What AWIS has the resources to do, and is in fact doing, is act in legal suits and monitor science legislation. Anne Briscoe, the past president of AWIS, wants to hear from any woman scientist who has a complaint about her lack of promotion, lack of tenure, or lack of re-appointment. AWIS has lawyers; AWIS can give good advice. Anne's address is: Harlem Hospital Center, Columbia University, New York, N.Y. 10037. AWIS is also the only women's organization equipped to monitor science legislation and to try changing it. They need our money to do this and the best way to give them our money is to join. Their address is 1346 Connecticut Avenue N.W., Suite 1122, Washington, D.C. 20036.

FOPW is an umbrella organization, of which we are a member. To my mind, the most important member of FOPW is WEAL, which in general monitors legislation and government action in relation to women. WEAL needs our money and membership too. Its address: 733 15th Street N.W., Washington, D.C., 20005.

In addition, Mary Clutter, a biologist with the NSF, has asked that any woman having trouble with NSF grant proposals call her at 202-632-4314.

Which brings me to the main conclusion I drew from this conference:

If women are going to help women we're going to have to do it pretty much on our own. Things get muffled, things get swallowed, things get lost when you work through government. Government agency heads don't know their own policies. They move through society like well-meaning tourists through the beggars of Marrakesh - how can they do justice to all these beseeching hands? So to work with them you tone down, don't look like a beggar, pretend to be one of them; and you lose sight of what you need. Despite the dedication of the OOS staff, and perhaps because I did have some expectations before the conference, I am more cynical than ever. Clearly government has to be watched. I am not so certain that it is worth working with.

Keeping cool. About 1/3 of our time was spent listening to people talk at us. At least half of those speakers were overtly sexist (although all would have denied it). The worst one I heard (being a cynic I didn't hear them all) was Margaret Mead (who of course denied her sexism). It was an indignity to have to listen to that stuff. What was worse was that we had to listen politely. This is the discipline of politics, and I question its advisability for all. For one thing, a lot of the sexism was truly unconscious, e.g. Phil Handler of the NAS misinterpreting the request that qualified women not be overlooked for NAS membership as the request that less qualified women be admitted. He can't learn if we don't speak up. Furthermore, while hysterical anger does no-one any good, controlled anger is a good way to be taken seriously. Ask any parent. But it was very clear that we were expected to keep the lid on. And this seeped into our discussion groups as well.

Statistics. During the course of his speech, Handler mentioned that he was surprised to learn that between 1970 and 1976 there were no Oriental female PhD's in engineering, mathematics and the physical sciences. Many of the participants were also quite surprised, since the statement is false. This leads to a serious question: given the small population from which these facts are gathered, how accurate are they? We need accurate data and good statistical studies; clearly we can't assume that we'll get them. In this matter, the OOS staff are to be greatly commended for their caution and care.

Conference recommendations. Here the real problem of the conference became apparent. Women who had been successful in science were being asked to set policy which would ensure that more women could be successful. The problem is that by the fact that we have remained in science, we cannot speak of the problems faced by those who left. Thus most of the women, having done well in a predominantly male atmosphere, were unsympathetic about the need for single-sex programs; others spoke out about the problems faced by male scientists, claiming that these problems were really no different than what they had faced, and wanted to change most recommendations so that "women" would be dropped. Single-sex programs were not supported, and in the final press conference one speaker was very careful to point out that men had a hard time too and we didn't really want special programs, just equal treatment.

The conference nadir came for me when a woman in my small discussion group suggested that a high school girl truly interested in science should simply avoid the influences pushing her away from it. It thus becomes recommended behavior for the adolescent girl scientist to avoid much of her family, nearly all of her peers, and such recreational activities as television and movies. If we are going to be so unsympathetic, we deserve the professional isolation in which so many of us operate.

On this point, Judith Longyear has the excellent suggestion that the OOS sponsor a conference of women with scientific aptitude who are not in science. Then it can have a better idea of how to bring them in.

Two things that nobody lacked sympathy about were problems with tenure and the need for more grant money. So we enthusiastically passed recommendations saying, in effect, that we should all get tenure and more grant money. Good luck.

In the long list of recommendations running to several pages, quite a few are good, and one or two even creative. The recommendations will appear in the final conference report. I remain skeptical about their implementation.

Something we had better act on quickly. A recent tax ruling is that a graduate student whose NIH fellowship includes a tuition grant is to be taxed on the entire grant. Thus a graduate student taking home $4,000 from the NIH with a $5,000 tuition grant is taxed on $9000 and gets to live on zilch. Protests should be sent to Senator Edward Kennedy.* The ruling is based on a patent agreement peculiar to NIH, so holders of NSF grants shouldn't panic.

Perspective on the mathematical community. By being with chemists, physicists, and biologists, I learned that the mathematical community is tremendously naive politically. One chemist in her first year out of grad school found herself handling a $125,000 grant and heading up a lab. Most of the lab scientists did not find it strange to go down to NSF and personally fight for their grant monies. Mathematicians just don't have that kind of experience in our work, and we should be aware of how that handicaps us outside our own community.

Finally, I really got to appreciate the AWM. Our members are getting a tremendous amount done. And perhaps one reason for my disappointment at the NSF/AAAS-OOS meeting was comparing it to most AWM meetings. We are both more sympathetic to each other and more open about our differences. This is something that NSF/AAAS-OOS might try to encourage in future meetings.

* : see article which follows

LEGISLATION RELATED TO WOMEN IN SCIENCE

Senator Edward Kennedy's response to Judy Roitman reads in part: "Thank you for your letter regarding taxation of the tuition grants from the NIH....on October 27 the Congress cleared legislation to extend through 1978 the tax-exempt status for money received by participants in the Armed Forces Health Professionals Scholarships Program, the Public Health Service/National Health Service Corps scholarship program and similar programs."

On October 20, Kennedy announced that on the first day of the new session of Congress in January, he will introduce a legislative packet to implement as many as possible of the recommendations coming out of the meeting on which Roitman reported. He said: "For fifty years cultural, educational and institutional barriers have blocked all but a very few women from full participation in the nation's scientific and technical progess....I don't believe that women should have to wait another fifty years for a fair chance to compete equally for careers in the exciting and highly respected fields of science and engineering.

"The virtual exclusion of women from careers in science and engineering is contrary to our national commitment to equal employment opportunity and weakens our nation's scientific research effort, which needs all the talent the nation can master. To bring about the needed changes, we will need the full cooperation of the scientific community, our academic institutions, public and private employers, and the federal government."

SYMPOSIUM ON WOMEN IN SCIENTIFIC RESEARCH

On February 15, 1978, a symposium entitled "Participation of Women and Men in Scientific Research" will be held as part of the AAAS annual meeting (Feb. 12-17, 1978, Washington, D.C.).

AMERICAN MATHEMATICS ASSOCIATION OF TWO YEAR COLLEGES (AMATYC)

by Karen Rappaport, AWM Council
(Dept. of Math. Essex County College,
Newark, N.J. 07102

AMATYC is a national organization concerned with the needs and problems of the two year college mathematics teacher. Membership is $12.00 and includes a subscription to the AMATYC Journal. Membership information may be obtained from:

Brandon Wheeler, AMATYC Treasurer
Sacramento City College
Sacramento, California 95822

AMATYC held its third annual meeting in Atlanta, October, 1977. Included in the program was a presentation entitled: "Rediscovering Women Mathematicians", given by Karen Rappaport. The fourth annual convention will be held in Houston in October, 1978. Anyone interested in presenting a paper appropriate to the two year college teacher should contact:

Alice Hagood, Convention Chairperson
Alvin Community College
Alvin, Texas 77511

2 pages

AWM Newsletter Nov., Dec. 1977

CHARLOTTE ANGUS SCOTT 1858-1931

by Pat Kenschaft (professor of mathematics, Montclair State College, Upper Montclair, N.J. 07043)

In 1885 it was an act of daring for any mathematician, especially a woman, to leave the universities of Europe for the United States. Then primarily concerned with expansionistic activities such as taming the "Wild West", Americans had little interest in intellectual pursuits and practically none in creative mathematics. Yet Charlotte Scott, possibly spurred by the lack of job opportunities in Europe, left her native England at the age of 27 to become the first mathematics professor of a new college called Bryn Mawr.

For Bryn Mawr's first forty years, Charlotte Scott was the chairman of its "mathematical department". She helped it become a noted center of learning, not only as an organizer and as a teacher (many of her students became noted mathematicians), but also as a textbook author and as a researcher in analytical geometry. [Note: A partial list of her publications will appear at the end of the second installment of this article.] Soon after her arrival she became active in the fledgling New York Mathematical Society in an effort to find intellectual companionship. In 1892, she became one of the founding members of the American Mathematical Society. In 1906, she became its first female vice-president, almost 70 years before Mary Gray became the second. She kept up her European contacts by making frequent trips abroad.

Charlotte Scott came from a line of innovators. Both her father (the Rev. Caleb Scott) and her father's father (the Rev. Walter Scott) were Congregational ministers, called "non-comformist" because they did not belong to the established Church of England. Education for women was on active concern of the British Congregational Church in the later 19th century. When Caleb Scott's gifted daughter displayed a desire to study mathematics seriously, he did his best to provide her with competent home tutors since there were few secondary schools open to women. In 1876, Charlotte won a scholarship to Girton College, the first women's college in England and then only seven years old. Most of her classmates had had similar spotty tutoring and lonely individual study at home prior to their college admission.

Scott first received widespread public attention in 1880 when she obtained special permission to take the Tripos Exams, the final undergraduate exams at Cambridge University. She tied for eighth place in mathematics and thus, had she been a man, would have received the title of "Eighth Wrangler". As it was, she was not allowed to be present, or even officially mentioned, at the commencement ceremony. The young men were so incensed at this injustice that when the name of the official Eighth Wrangler was called, the hall rang with shouts of "Scott of Girton! Scott of Girton!".

This was a welcome change from former publicity for the College. A few years earlier Cambridge society had been horrified by a rumor that two Girton students had been riding unchaperoned in a dogcart with a clergyman. Actually their chaperone, dressed in mourning with a stiff black hat, had been mistaken for a clergyman. Nevertheless, the rumor did much damage to the status of Girton College women.

Thus the Girton community did its best to honor Scott. An eyewitness report reads, "At dinner we clapped and cheered her ... Then we told her that there would be College Songs in Hall at 9. She was led in by Miss Welsh up an avenue of students to the top of the Hall, while 'See the conquering hero comes' was played on the piano and sung by us all. At the top Miss Herschel was standing on a sort of dais, and when we had finished singing she recited an ode to Miss Scott, composed by Miss Welsh for the occasion, and then crowned her with laurels, while we clapped and applauded with all our might."

The general public responded too. The February 7, 1880 issue of Punch announced her achievement and pleaded:

> But when the Academy doors are reopened to the Ladies let them be opened to their full width. Let us not hear of any petty restrictions or exclusions from this or that function or privilege.....

A petition was circulated throughout England asking that women be admitted to the Cambridge examinations as a right, not a special privilege, and that they be permitted to receive Cambridge degrees corresponding to their performance on the exams. Over 8000 signatures were collected in three months.

As a result, the following year women were granted the right to be admitted to the Cambridge honors exams and to have their names announced along with those of their male competitors. Thus they would have public recognition of their intellectual achievements, an important asset in seeking employement.

Nonetheless, Cambridge University did not grant degrees to women until 1948. Meanwhile women could study at Cambridge and receive degrees from the University of London by taking "external examinations". In this fashion, Scott received her bachelors degree in 1882 and her doctorate in 1885 from the University of London for work done at Girton College in Cambridge. In 1882 she joined the Girton College faculty as a "resident lecturer in mathematics", teaching undergraduates as she pursued her graduate studies. Girton College was still very small; she was the third member of the staff.

In 1885, the first faculty of Bryn Mawr was not much larger. It had seven members, including another recent doctoral recipient - Woodrow Wilson. But Bryn Mawr had a graduate school and was the first womens' college in the U.S. to grant the Ph.D. degree.

-to be continued next issue-

COMMUNITY SERVICE: INCOME TAX ASSISTANCE

Thelma E. Bradford, assistant professor of mathematics, North Carolina Agricultural and Technical State University, Greensboro, NC 27411, 10 years ago began a community service program in response to a request from the I.R.S. Staffed by students in the class of "Mathematics of Business and Finance" (now also by students from Accounting and Personal Finance classes), the program provides free income tax assistance from January through April to the elderly and to those persons who fall in the "low income bracket", including students. Training is done through the Volunteer Income Tax Assistance (VITA) program of the IRS. As Bradford points out, instituting similar programs gives us the opportunity to "get involved and do something tangible with (our) students for humanitarian purposes".

CORRESPONDENCE ON WOMEN'S HISTORY

by Teri Perl, AWM Council coordinator of women's history project
(525 Lincoln Avenue, Palo Alto, CA 94301)

Ruth E. Channell (8121 Waverly, Kansas City, KS 11235) has written a master's thesis entitled A Compendium: The Women of Mathematics. It contains an extensive reference list (399 items).

Paul J. Campbell and Louise S. Grinstein (St. Olaf College, Northfield, Minn. 55057 and Kingsborough Community College of CUNY, Brooklyn, NY 11235) have published (in a recent issue of Philosophia Mathematica) "Women in Mathematics: A Preliminary Selected Bibliography". They welcome any additions to their list.

Some correspondents have material written on women mathematicians for which they seek publication sources. Nanda Hoppenwasser (1274 Northwood Lake, Northport, AL 35476) has written a very readable biography on Emmy Noether for "an adolescent or general audience" called "Emmy, the Life of a Mathematician." Karen Rappaport (Dept. of Math., Essex County College, 303 University Avenue, Newark, NJ 07102) has written "a biographical paper of about 15 pages plus footnotes, on Sonya Kovalesky. It is not mathematical and I am looking for a place to publish it." Since one of the primary goals of the AWM project is to disseminate more information about women who were significant mathematicians in the past, any ideas or leads which might facilitate publication of such materials would be welcome.

SEX-RELATED DIFFERENCES IN MATHEMATICS LEARNING: MYTHS, REALITIES, AND RELATED FACTORS

By Elizabeth Fennema and Julia Sherman, Dept. of Curriculum and Instruction, The University of Wisconsin-Madison
excerpts from a paper presented to the AAAS, Boston, 1976, in a symposium entitled "Women and Mathematics"

A study funded in 1974-75 by the NSF gives some new insight on the question of sex-related differences in mathematical achievement between high-school males and females [1]. During February and March of 1975, 589 females and 644 males selected from mathematics classes in the four Madison, Wisconsin, public high schools were given several tests, including a standardized achievement test. These students were enrolled in college-prep mathematics classes appropriate for their grade. Differences between male and female groups in mathematics achievement were very small. In two of the schools significant sex-related differences in math achievement were found; these differences in favor of males were about two test items at each grade level. The differences were not more pronounced with increasing grade level and more difficult material. These findings suggest that the existing opinion that females have less capacity for mathematics needs to be modified.

However, there continue to be fewer females than males who elect to study mathematics. A detailed study of participation in mathematics classes of the Madison, Wisconsin high schools was made concurrently with the study reported above [2]. The table shows the percentage of males and females enrolled in grade-typical mathematics courses. More males than females were enrolled in General Mathematics - a terminal math course. By 11th grade a higher percentage of males were enrolled at each school, and the difference was greater at the 12th grade. It is clear that many more males

than females studied math in the 11th and 12th grade, although substantial numbers of females did study math in the 11th grade. However, Madison is considered to be a liberal, intellectual city. It is likely that the discrepancy by sex in enrollment in mathematics courses is even greater in other locales.

Percentage of Boys and Girls in "On-grade" Math Classes[a]

	School							
	1		2		3		4	
Grade	F	M	F	M	F	M	F	M
9[b]	06	11	25	31	21	28	16	25
9[c]	81	82	71	69	76	74	88	77
10	53	69	51	50	62	65	40	36
11	36	43	24	32	30	34	22	23
12	12	20	04	15	11	23	03	05

[a]Percentage obtained by dividing number of each sex enrolled in an "on-grade" mathematics class by enrollment of that sex in that grade. The two sets of data were not obtained on the same day so percentages may be slightly inaccurate.

[b]General Mathematics

[c]Algebra

Does this trend continue in higher education? Data from the University of Wisconsin provide some insight. In the fall of 1975 there were 818 males and 257 females enrolled in the first semester of the more advanced calculus sequence - a ratio of about 3 males to 1 female. Enrolled in the third semester of the seuence were 431 males and 72 females - a ratio of 6 males to 1 female. Approximately 53% of the males who started this sequence studied math at least 3 semesters while only 28% of the females continued for 3 semesters. The number of females who started studying university math was lower than the number of males and the continuation rate was higher for males. In 1975 there were 45 female and 130 male undergraduate mathematics majors. There were 15 female and 164 male graduate students in mathematics. There were one female and 59 male tenured faculty members in the Mathematics Department. These data suggest that the gap in studying mathematics evident in 11th grade widens indefinitely.

Data such as the above are interesting and useful for consciousness raising. Of more importance, however, is information concerning why this differential studying of mathematics and sometimes differential achievement in mathematics exists. It has been suggested [3] that quantitative ability is transmitted as a recessive characteristic on the X chromosome. If one accepts this hypothesis, it follows that fewer females are inherently as capable as males to learn mathematics. Although other prominent authorities [4] say that the evidence in this area is inconclusive, the inheritance

of quantitative ability as an explanation of females' less adequate mathematical performance appears only to be of theoretical interest for at least two reasons. First, the best predictors of success in mathematics are previous mathematical learning and general intelligence. As there are no significant sex-related differences in general intelligence and until about adolescence no significant differences in mathematical achievement scores, the number of females who have equal capability with males for learning high school mathematics is much larger than the number of females who elect to study mathematics in late high school and college. Second, even considering the differences found in male-female average mathematical performance, the performance distributions are not nearly so different as are the distribution of the sexes in mathematics/science careers. Clearly, influences other than those associated with heredity must be affecting females' mathematics learning and usage.

Many cognitive and socio-cultural factors have been hypothesized to be related to achievement of women in general and to mathematics learning and studying in particular. Two cognitive variables and eight socio-cultural variables were investigated. The cognitive variables were verbal ability and spatial visualization ability. The affective variables were confidence in ability to learn mathematics; perception of mathematics as a male domain; perceived attitudes of mother, father, and teacher toward one as a learner of mathematics; attitude toward success in mathematics; effectance motivation in mathematics; and perception of usefulness of mathematics.

The pattern of significant sex-related difference found in the affective variables in the study is important. At the schools where significant differences in math achievement were found, significant differences on 5 or 6 of the affective factors were found. Certainly this pattern of sex-related learning differences in attitudes in conjunction with sex-related differences in mathematics suggest that a matrix of social/cultural factors influences strongly females' learning of mathematics.

In the 1975 NSF study, information was also gathered about the characteristics of students electing to continue the study of mathematics. Students in the 10th and 11th grades were asked to indicate whether or not they intended to study mathematics the next year. Since they responded about the same time they were officially selecting classes for the following year, the data were fairly reliable. As might be expected, those who intended to continue their study of mathematics scored significantly higher on math achievement. In general, more boys than girls intended to continue. However, this was particularly true of boys in the lower half of their class on math achievement. All other variables appeared to differentiate about equally between boys and girls who did and did not intend to continue their study of mathematics. Covarying out the effects of cognitive factors generally confirmed these results as did a comparison of students enrolled in mathematics.

It appears that while the variables associated with continuing to study mathematics were much the same for both sexes, the fact that males had more positive attitudes toward mathematics in some fairly specific ways helps to explain why the percent of males who continue to study mathematics is higher than any difference in achievement would predict.

Conclusions

(1) Sex-related differences in mathematics achievement are not universal or even nation-wide phenomena. When previous mathematics study was controlled, males significantly out-performed females in only two schools out of four.

(2) Many fewer females than males study math in 11th and 12th grades. Sex-related differences in the studying of mathematics are prevalent with the gap between the number of males and females who do study math formally, increasing throughout schooling.

(3) The relationship between cognitive factors and differentialy learning of mathematics by the sexes is unclear, and more research is clearly needed. Although the study reported here gave little indication that either verbal or spatial visualization ability affected boys' and girls' learning of math differently, more data is needed on the interaction effects of these abilities, on different types of mathematics problems, as well as on mathematics learning of different ages.

(4) Differential mathematics studying and mathematics achievement by the sexes, when it occurs, is at least partially caused by socio/cultural factors mediated through sex-role expectations. Lending support to the idea that perceived sex-role is a critical determiner in differential mathematics learning by the sexes is the increasing gap in achievement and studying which occurs during the adolescent years concurrently with the increasing priority given by both males and females for development of a personally workable sex role. When sex differences in mathematics achievement were found, many sex-related differences in attitudes toward math were also found.

References

1. Fennema, E., & Sherman, J. Sex-related differences in mathematics achievement, spatial visualization and affective factors. American Educational Research Journal, 1977, 14(1), 51-72.

2. Sherman, J., & Fennema, E. The study of mathematics by high school girls and boys: Related variables. American Educational Research Journal, 1977, 14(2), 159-168.

3. Stafford, R.E. Hereditary and evironmental components of quantitative reasoning. 1972. Review of Educational Research, 42:2, 183-201.

4. Maccoby, E.E. and C. N. Jacklin, 1974. The Psychology of Sex Differences. Stanford, California, Stanford University Press.

5. Fennema, E. Mathematics learning and the sexes: A review. Journal for Research in Mathematics Education, 1974, 5, 126-139.

6. Fennema, E. Influences of selected cognitive, affective and educational variables on sex-related differences in mathematics learning and studying.
Position paper available from: Ms. Judy Shoemaker
National Institute of Education
1200 19th Street, N.W.
Washington, D.C. 20208

OF POSSIBLE INTEREST

The Project of Equal Education Rights (PEER) has put together a comprehensive monitoring kit designed to help citizens check on progress made by local elementary and secondary schools to achieve educational equity for girls. Write: PEER, 1029 Vermont Avenue, N.W., Suite 800, Washington, D.C. 20005.

The Institute for Independent Study at Radcliffe College announces its Program for Research Associateships on Women in American Society for 1978-80. Radcliffe is especially interested in fostering research on women and the professions with respect to both career patterns and the integration of personal and professional commitments. Applications due January 16, 1978. Forms are available from Research Associateship Program, Institute for Independent Study, Radcliffe College, 3 James St., Cambridge, MA 02138.

The Organization of American Historians (OAH) Committee on the Status of Women in the Historical Profession was formed in April, 1970 to combat discrimination against women historians and to further research in women's history. Projects: sponsoring programs, social events and workshops at annual OAH meetings; lists of works in progress in women's history; guide to women's history source materials; survey of job candidates and of departments that were hiring.

Information on establishing a chapter of Pi Mu Epsilon, the national collegiate math honorary society, can be obtained from the Secretary-Treasurer, Dr. Richard A. Good, University of Maryland, College Park, MD 20742.

Career Opportunity Update, published bi-weekly by Career Research Systems, Inc. (PO Box 1878, Huntington Beach, CA 92647), lists job openings in many areas. Most positions are in computer sciences and data processing or in engineering and related areas.

Write to the Project on the Status and Education of Women, Association of American Colleges, 1818 R Street, NW, Washington, D.C. 20009 for information on federal regulations re discrimination and how to file discrimination cases, as well as newsletter called On Campus with Women.

The Seattle conference center of Battelle Memorial Institute can be made available to external organizations for scientific, technical, and educational activities. For specific information, write Conference Coordinator, Battelle Seminars and Studies Program, 4000 N.E. 41st St, PO Box C-5395, Seattle, WA 98105.

NONSEXIST LANGUAGE

The National Council of Teachers of English has available an excellent pamphlet, "Guidelines for Nonsexist Use of Language in NCTE Publications". Here is one of the recommendations:

"Using the masculine pronouns to refer to an indefinite pronoun (everybody, everyone, anybody, anyone)...has the effect of excluding women. In all but strictly formal usage, plural pronouns have become acceptable substitutes for the masculine singular.

Example: Anyone who wants to go to the game should bring his money tomorrow.

Alternative: Anyone who wants to go to the game should bring their money tomorrow."

You can get 1-15 copies of the pamphlet free from NCTE, 1111 Kenyon Road, Urbana, IL 61801.

LETTERS TO THE EDITOR

Dear colleagues,

I am currently preparing a book on Women in Science and Math which I expect will be published within a year. The book will be geared for high school and college women. Please send a brief description of any of the following types of articles you would be willing to submit for possible inclusion in the book.

1. A 3-5 page autobiography - written in the first person, including some of: your family history, educational background and experiences, what/who motivated you to pursue a career in science, what kind of work you do, any special experiences you have had as a result of being a woman scientist, etc.

2. A 3-5 page biography of a woman scientist.

3. Sociological and pyschological aspects of women in science - e.g., what causes most females to shy away from sciences, what characterizes women who select sciences, how do children of various ages form sex-specific attitudes toward science, what progress is being made in elementary school science and math tests toward equal treatment of the sexes, what factors make a woman a successful scientist and do these factors differ from those for men, etc.

4. The current status of women in Science and Math: in academia, government, industry.

Thank you.

Sincerely, Phyllis Chinn, Math. Dept.,
Humboldt State University, Arcata, CA 95521

Dear Ms. Leggett,

In the July Newsletter I read with great interest the transcripts of the panel discussion "Choosing our Lives" conducted at the St. Louis AWM meeting. The section which interested me most was Ms. Roitman's transcript, especially the part where she reported on a friend in a job-hunting situation similar to hers. He had said to her: "I do everything I'm supposed to do and there is no guarantee of a living ... and even though I do everything that's asked of me, I may have no job."

The problem here, my fellow human beings, is that we do not look to ourselves for the solutions to our problems....It is insane and self-defeating to do "everything asked" of you if society is the only self-righteous ingrate doing the asking. What would lend to a more peaceful frame of mind is doing whatever you ask of yourself. Then you can set your own standards, relinquish the dependence on society's modes. If you fail, you will find it easier to reset your goals without the paralyzing grip of "civilized" guilt.

My congratulations to Ms. Roitman and to all who challenge society for their own peace and mental well-being. I hope their confidence in themselves never wanes and that they eventually find the personal satisfaction which they seek. With stubborness like this their goals will be all the more obtainable.

Yours truly, Catherine Folio

JOBS

The vacancies listed below appear in alphabetical order in an alphabetical listing of states. EO/AA means Equal Opportunity, Affirmative Action Employer. There is a $5.00 charge per ad unless you are a member of AWM when you receive two ads free per year.

University of California, Davis, Dept of Math., Openings: i) Prof of Statistics, salary and rank depend upon qualifications, and ii) Asst. Prof of Statistics. Beg. Fall 1978. Requirements: competence in research, teaching, and statistical consultation. Applications and four letters of recommendation to be sent to John Van Ryzin, Chair, Search Committee, Statistics, Dept of Math., University of California, Davis, CA 95616 by Feb. 15, 1978. EO/AA

Pomona College, Math Dept., Visiting positions, Fall 1978 (temporary for sabattical replacements). 1) a 2 or 1 yr appointment at the asst. prof level (PhD required). 2) A 1 yr appointment full or part time (PhD preferred). Dept. actively engaged in research, hence research ability is an important consideration. Candidates must be able to teach a variety of under grad subjects, three courses each semester. Send vita to Elmer Tolsted, Chairman, Dept of Math, Pomona College, Claremont, CA 91711. EO/AA

San Jose State University, Dept of Math, three openings. 1) computer science or strong emphasis in computer science, 2) math modeling and/or computer science, 3) statistics and applied math. These possible tenure-track positions require an ability and interest in teaching and demonstrated research. PhD required. Teaching load 12/hrs/sem. Current salary scale $14,256 - $17, 136. Deadline for applications March 1, 1978. Send vita to Prof John Mitchem, Chairman, Dept of Math, San Jose State University, San Jose, CA 95192. EO/AA

University of Connecticut, Storrs, Dept of Math, Head of Dept., 35 full-time faculty members at main campus at Storrs, 13 full-time faculty members at branch campuses. Qualifications include strong administrative and leadership ability, established record of distinguished research and a commitment to excellent teaching. Position available Sept. 1, 1978. Send resume and names and addresses of three references to Frank D. Vasington, Search Committee Chairman, Box U-98, University of Connecticut, Storrs, CT 06268. EO/AA

Yale University, Dept of Statistics, Asst. or Asso. level position may be available effective Sept, 1978. This position is without tenure but it would have a 3 or 5 yr. contract. The most important qualification is high quality. Because the dept. is small we will favor candidates who promise to be successful in teaching undergrad. and grad students, and in research. We are interested in both theoretical and practical aspects of statistics. Creative statistical computing is emphasized. Please contact I. Richard Savage, Chairman, Dept of Statistics, Yale University, Box 2179, Yale Station, New Haven, CT 06520. EO/AA

Yale University, Dept of Math, three Gibbs Instructorships for PhDs with outstanding promise in research. Two-year appointment starting 7-1-78. Teaching load light. Deadline for applications 2-1-78. Salary for 1977-78 is $14,500; increase expected for 1978-79. Contact: Gibbs Committee, Dept of Math, Yale University, New Haven, CT 06520. EO/AA

Yale University, Dept of Math, One tenured appointment, Prof or Asso Prof, in analysis in 1978 or 1979. In addition to distinquishing themselves by achievements in research, candidates should be recognized as successful teachers of graduate and undergraduate students. Preference will be given to candidates whose research supports and supplements the interests of colleagues at Yale in several complex variables, differential geometry, and partial differential equations. Submit vita, copies of publications, and names of three references to Prof. Walter Feit, Chairman, Dept of Math, Yale University, New Haven, CT 06520. EO/AA

University of Delaware, Dept of Statistics & Computer Science. Regular position available Sept 1978. Rank and salary commensurate with experience. Applicants should have demonstrated potential and commitment to research and graduate ed. All areas of computer science are invited, but preference will be given to information systems and mathematical software. Applications are requested by March 1, 1978 to Dr. James F. Leathrum, Dept of Statistics and Computer Science, University of Delaware, Newark, DE 19711. EO/AA

Jacksonville University, Mathematics position start August 29, 1978. PhD preferred. Teaching mathematical statistics and analysis or applied math in addition to the usual undergraduate courses. Background in computing desirable. Rank and salary negotiable. Application deadline Feb. 1, 1978. Write to Marilyn L. Repsher, Head, Math Dept., Jacksonville University, Jacksonville, FL 32211. EO/AA

Project SEED, Inc., Math specialists to participate in nationwide program. Project SEED mathematicians teach abstract, conceptual math to "disadvantaged" elem. school children. Currently recruiting for part time and/or full time in Atlanta, Chicago, Browning Montana, Plainfield NJ., Los Angeles and Berkeley. Contact Toni Carroll, 10724 S. Drew St., Chicago, Ill. 60643 (312)881-3664.

University of Illinois at Chicago Circle, Math Dept. possible junior or senior openings in pure math, applied math, statistics, computer science, and math ed. PhD and strong record in teaching and research required. First consideration will be given to applications received by January 15, 1978. Send vita, publications list, and description of current research plus 3 letters of recommendation to Philip Dwinger, Head, Dept of Math., University of Illinois at Chicago Circle, Box 4348, Chicago, Ill. 60680. EO/AA

Northern Illinois University, Dept of Math, Asst. Professor for the Spring Semester 1978 only. PhD required plus commitment to teaching and research. A research background in Math Ed preferred, but strong candidates in other fields will be considered. Applications should be received by Dec. 2, 1977. Send to Dept of Mathematical Sciences, Northern Illinois University, DeKalb, Ill 60115. EO/AA

Indiana University, Math Dept. At least 2 asst. professorships in statistics. Expertise in analysis of variance and statistical inference desirable although all outstanding candidates will be considered. Applications from new PhDs welcomed as well as those who have already demonstrated distinction in research and teaching. At least 4 asst. professorships for 1978-79 whose fields are algebra, topology, numerical analysis and several complex variables are available. Will also consider outstanding candidates in any field of math. At least 1 senior position in the dept is expected. Although we are particularly interested in candidates whose fields are probability and/or statistics, we will consider outstanding candidates in any field. Candidates should have demonstrated excellence in research and teaching. Send resume to Morton Lowengrub, Chairman, Dept of Math., Swain Hall-East, Bloomington, Indiana 47405. EO/AA

Kansas State University, Dept of Statistics, two positions beginning Sept. 1, 1978. 1) Asst/Assoc Prof (depending on experience). Teaching/Research in Theory-Multivariate Design, Sampling or Probability. Tenure Track. 2) Asst Prof Teaching/Research in Applied or Theory - Bioassary, Multivariate Sampling, Stochastic or Design. Tenure subject to legislative action. Send Vitae and names of 3 references to: Dr. Arthur D. Dayton, Head and Director, Dept of Statistics and Statistical Laboratory, Kansas State University, Manhattan, Kansas 66506. EO/AA

University of Maryland, positions beg. Aug. 1978. Several tenure track asst. profs. in Math and Statistics (one in ordinary differential equations) for people with strong research potential. Tenure level position in statistics (applied stat preferred); possibility of tenure level position in Math. Latter positions require strong research record. Send vita and three letters of reference to Prof. W.E. Kirwan, Chairman, Dept of Math, University of Maryland, College Park, MD 20742. Applications accepted until positions filled. Offers will begin to be made in January 1978. EO/AA

University of Maryland, Dept of Math, two "chair" professorships. One for a person in number theory or algebra or algebraic geometry (with collateral interests in number theory): one for a person in harmonic analysis or topological dynamics or in the interactions of functional analysis with other fields. Send inquiries to Prof. W.E. Kirwan, Chairman, Dept of Math, University of Maryland, College Park, MD 20742. EO.AA

University of Maryland, Computer Science Dept., has several positions available for an assistant professor. Candidates interested in operating systems, programming languages, and computational statistics are preferred, but computer scientists who have strong research potential in any area of computer science will be considered. PhD required. Send resume to Mr. Jack Minker, Professor and Chairman, Dept of Computer Science, University of Maryland, College Park, Maryland, 20742.

University of Michigan-Dearborn, Computer Science, UM-D plans to make an appointment at the Asst. Prof level of a person with capability in teaching and research in computer science. Preferred specialities are systems programming, language processing and info. systems, but other field will be considered. PhD in computer science is required for the asst. professorship, but an interim instructorship is possible for a PhD candidate in computer science whose work is substantially complete. This tenure-track position starts Sept. 1978. Applicants send resume, including names of references to Prof. John Riordan, Faculty Search Committee, 4901 Evergreen Road, Dearborn, MI 48128. A non-discriminatory, affirmative action, Title 9 employer.

Wayne State University, Dept of Math, One tenure-track position available Sept. 1978. PhD required. Excellence in research and teaching expected. Rank and salary to be negotiated. Applications should be accompanied by vita and names and addresses of 3 professional references. Consideration expedited if letters of reference are initiated by applicant. Send to Prof. B.J. Eisenstadt, Chairman, Dept of Math, Wayne State University, Detroit, MI 48202. EO/AA

Dartmouth College, Dept of Math, two John Wesley Young Instructorships. 2-yr, non-renewable, postdoctoral appointments for PhDs with strong interests in research and teaching. Teaching duties average 6 hrs/wk and include introductory, advanced undergrad, and grad courses. Nine-month salary $13,500 first year plus $2,000 two-month summer research stipend for instructors in residence during the summer. Write to Prof. Richard H. Crowell, Chairman, Math Dept., Dartmouth College, Hanover, NH 03755. EO/AA

Dartmouth College, Computer Science, Asst. Prof. Initial 3-yr appointment. Possibility of reappointment and eventual tenure. Qualifications include demonstrated research in theoretical computer science and ability and interest in teaching undergrad courses in computer science and mathematics. PhD required. Write to Prof. Richard H. Crowell, Chairman, Math Dept. Dartmouth College, Hanover, NH 03755. EO/AA

M.I.T., Math Dept. A limited number of postdoctoral instructorships are available in the field of Applied Math. Appointments will be made on the basis of superior research potential, for a period not exceeding two years. Applications are considered and final decisions announced on or before March 15, 1978. For further info write to Committee on Applied Math, Room 2-345, Mass. Institute of Technology, Cambridge, MA 02139. EO/AA

M.I.T., Math Dept. One or two assist professors in pure mathematics will be appointed if sufficiently strong candidates can be found. The criteria are (1) superior ability as a research mathematician, (11) demonstrated effectiveness as a teacher, (111) two years or more of postdoctoral experience. Write to Math Dept., Mass Institute of Technology, Cambridge, MA 02139. EO/AA

M.I.T., Math Dept., C.L.E. Moore Instructorships in Math are open to postdoctoral mathematicians who show definite promise in research. Teaching loads are 6 hrs. p.w. one semester, 3 hrs. p.w. the other. Appointments are for one year, renewable for one additional year. The academic year salary will be at least $15,500. Applications should be filed not later than Dec. 30, 1977. Referees should return reference forms direct to M.I.T., Cambridge, Mass. 02139 by Jan. 13, 1978. For further into. write to Pure Mathematics Committee, Room 2-263, Mass. Institute of Technology, Cambridge, MA. 02139. EO/AA

Rutgers University, Dept of Math, Asst. Prof of Math: possible opening for 1978-79. Renewal and/or tenure possible. Ph.D and demonstrated teaching effectiveness necessary. Specialty in some area of applied math desirable. Send inquiries to Prof. E. Boylan, Chairman, Dept. of Math, 101 Warren St., Room 219, Smith Hall, Rutgers, NCAS University, Newark, NJ. 07102. EO/AA

State University of New York at Buffalo, Dept of Math, George William Hill and Emmy Noether Research Instructorships for 1978-80. Pending budget restrictions, at least 1 and possible 2 awards will be made, one each in the areas of Applied Math and Pure Math, with each appointment being for two years. Ample opportunity to carry forward research program. Stipend for 12 months beg. Sept. 1978 - $16,200. Generous staff benefits. Teaching load will total 2 One-semester courses during 12-month period. At expiration of 2-yr appointment, a Research Instructor will receive priority consideration for re-appointment as Asst. Professor. PhD required. Prepare a summary of post high school educational background as well as a sketch of past and projected research activity and request at least 3 mathematicians to send letters of recommendation to Dr. A. Dean MacGillivary, Chairman, Dept of Math, 106 Diefendorf Hall, Buffalo, NY 14214. Deadline for applications Jan. 20, 1978. EO/AA

Union College, Dept of Math, Asst. Prof starting Sept. 1978. Preferred fields: numerical analysis and applied math. Applicants in other areas will be considered. Appointment for two years and terminal except if candidate has particularly strong credentials. Salary competitive, full range of fringe benefits, 9-hr teaching load. Send resume to Arnold Seiken, Chairman, Dept of Math, Union College, Schenectary, N.Y. 12308. EO/AA

State University of New York, Stony Brook, Dept. of Math, Asst or Asso Prof in area of operations research and statistics. Applications invited from recent Ph.D's with strong academic training and interest in applications. Send inquiries to Dr. Edward Beltrami, Chairman, Dept of Applied Math and Statistics, State University of New York at Stony Brook, Stony Brook, New York 11794. EO/AA

Syracuse University, Dept of Math, 2 regular renewable faculty positions available. One statistician or applied probabilist working in statistics at the asst. or asso. prof. level; the other for a numerical analysist at the asst. prof. level. Also, a visiting position and possibly other 1-yr terminal positions in any field. For all positions research potential is of primary importance. PhD required (may be obtained in '78). All positions have 2-course teaching load. Include detailed vita, 3 letters of reference and send by Feb. 28, 1978 (Jan 15 for visiting position) to Prof. J.E. Graver, Dept of Math, Syracuse University, Syracuse, NY 13210. EO/AA

Rensselaer Polytechnic Institute, Computer Center, IBM 3033 is being installed to support lg. network of terminals and distributed micro and minicomputers. Individuals are sought for the following positions: Training and User Support, computer language specialist, timesharing support specialist, hardward and communications engineer, systems design specialist, systems support specialist, systems programmer. Send resumes to Carol R. Tuttle, Manager of Recruitment, Rensselaer Polytechnic Institute, Troy, N.Y. 12181.

Rensselaer Polytechnic Institute, Mathematical Sciences, Two openings, starting Sept. 1978, for candidates showing considerable promise in research. One at asst. or asso. prof. level, in applied math with research interests in continuum mechanics and differential equations. The other, asst. prof. level in computer science with research interests in programming languages, especially language design and program verification. Other strong candidates considered. Teaching 6-7 hr/wk per semester. Send resume to Prof. R. C. DiPrima, Dept of Mathematical Sciences, Rensselaer Polytechnic Institute, Troy, N.Y. 12181. EO/AA

North Carolina State University, Raleigh, Dept of Statistics, Asst. Prof. Prime requirement - energetic person with high academic potential in statistics; duties include teaching, research, and statistical consulting with campus researchers. Preference given to applicants with interest in applied statistics over theoretical math statistics. PhD required. Either a 9 or 12 month appointment. Send resume, graduate transcript, reprints, dissertation abstract, and three reference letters to F.E. McVay, Chairman, Statistics Search Committee, Box 5457, Raleigh, NC 27607. EO/AA

North Carolina State University, Raleigh, Dept of Statistics, Asst or Asso Prof. level. Applicant to take lead in developing strong departmental program in statistical computing. PhD required, special expertise in numerical analysis, background in statistics, and experience in statistical computing. Position also involves research, consulting with faculty and some teaching. appointment on a 12-month basis. Submit resume, graduate transcript, reprints, dissertation abstract and three reference letters to F.E.McVay, Chairman, Statistics Search Committee, Box 5457, Raleigh, NC 27607. EO/AA

North Carolina State University, Raleigh, Dept of Statistics, Asst. Prof., coordinator of programming and service computing by Statistics Dept faculty and students in their own work and in the Dept of Agricultural Experiment Station work. PhD required but experienced person with Master's would be considered for non-tenure track appointment on 12 month basis. Submit resume, graduate transcript, reprints, dissertation abstract and three reference letters to F.E. McVay, Chairman, Statistics Search Committee, Box 5457, Raleigh NC 27607. EO/AA

North Carolina State University at Raleigh, Dept of Statistics, 3 positions. 1) Asst. or Asso. Professor to take lead in developing strong depart. program in statistical computing. PhD required. Position involves research, consulting with faculty and some teaching. 12-mo appointment. 2) Asst. Prof. coordinator of programming and service computing. PhD required, but experienced person with Master's would be considered for a non-tenure-track appointment. 12-months. 3) Asst. Prof. energetic person with high academic potential in statistics; duties include teaching, research, statistical consulting with campus researchers. Preference given to applicants in applied statistics. PhD required. 9 or 12-mo appointment. Submit resume, graduate transcript, reprints, dissertation abstract, and 3 reference letters to F.E. McVay, Chairman, Statistics Search Committee, Box 5457, Raleigh, NC 27607. EO/AA

Ohio State University, Dept of Math anticipates a position to be filled by a distinguished mathematician. Recognized leadership, outstanding research accomplishment and ability to enhance our instructional program would be expected of serious candidates. Inquiries from Algebraic Topologists are especially invited. Send resumes to Prof. Joseph Landin, Dept. of Math., 231 W. 18th Ave., Columbus, Ohio 43210. EO/AA

Ohio State University, Dept of Math invites applications for several anticipated positions on its regional campuses. These campuses located at Lima, Mansfield, Marion and Newark provide instruction in math at the freshman and sophomore levels. Rank of Asst. Prof., Ph.D. required. Since these are tenure track positions, continuing research as well as excellent teaching is expected of those appointed. Send resume and letters of recommendation to John Riner, Vice Chairman, Dept of Math, The Ohio State University, 231 W. 18th Ave., Columbus, Ohio 43210. EO/AA

Wright State University, Math Dept., Chairman at rank of professor beg. fall of 1978. Candidates should have leadership ability, demonstrated scholarly ability, administrative potential, appreciation of rule of pure and applied math. Salary open. Send vita and 3 letters of recommendation to Dr. Carl C. Maneri, Chairman, Search Committee, Dept of Math., Wright State University, Dayton, OH 45435. Deadline is Jan. 31, 1978. EO/AA

Temple University, Dept of Math, two lectureships for Fall 1978 for recent PhD's regardless of age. Appointments for a period not exceeding two years. Three course teaching load per semester at the undergraduate level. Salary $13,000. Send resume and three letters of recommendation to Albert Schild, Chairman, Dept of Math, Temple University Philadelphia, PA 19122. EO/AA

Clemson University Math Dept., Department Head. 12-mo. position starting July 1, 1978. Requirements: PhD, teaching experience, proven research ability, leadership capacity. Administrative experience highly desirable but not required.. Deadline for applications Jan. 15, 1978. Send applications to Dr. Paul T. Holmes, Chairman, Search Committee, Dept of Mathematical Sciences, Clemson University, Clemson, SC 29631. EO/AA

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