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REPORT FROM THE PRESIDENT

Those of you who were at the annual meeting of AWM held on January 24 in Washington know what a capacity crowd the meeting drew. When the plans for the meeting were made, there had been a choice between a room holding 125 or one holding 500. We chose the 125, which turned out to have been a mistake. All seats and standing room were taken and all aisles were filled with people sitting on the floor. Many people were unable to get in the room. There were four talks on current programs concerned with women in mathematics: two on the general topic of why there are not more women in mathematics and two designed to encourage women college students to study mathematics and thereby to increase their career options. Three of these programs (Rensselaer Polytechnic Institute, University of Cincinnati, University of Missouri at Kansas City) are being funded by NSF grants administered by the Educational Directorate and the fourth, the one at Mills College is financed by the San Francisco Foundation under a grant to Mills College for women in science. The speeches are printed in this Newsletter so that those of you who were not in Washington may read them. I want to thank each speaker both for her talk at the January meeting and also for submitting it for publication here.

The AWM session in Washington was a two-hour one so that time was available for a question and answer period with the speakers as well as for a business meeting. At the latter there were reports from members who have arranged sectional meetings of AWM in the last year: Evelyn Boorman who, with Louise Hay, planned the meeting at DeKalb last spring; Stephanie Troyer who, with Dorothy Shaffer, planned last fall's meeting in Middletown, Connecticut; Lida Barrett who, with Elizabeth Papousek, planned the November meeting in Knoxville. (See the report on this meeting at another point in the Newsletter.) It is gratifying to see the number of sectional meetings increasing. A convenient time to hold a sectional meeting is at the time that the AMS and/or MAA are meeting in your particular section. So please plan a meeting for your area. At the Washington meetings Linda Keen volunteered to arrange a meeting at the time of the AMS meeting in New York this month. Result: There will be an AWM informal sherry hour on Tuesday, March 25, at 4 p.m. in the Park Lounge, 18th floor, Biltmore Hotel. As of this writing I have just heard from Lida Barrett that she and Bettye Case have arranged for an AWM luncheon in Mobile at the time of the AMS and MAA meetings being held there on March 20, 21. However, it is not necessary that AWM meet only in conjunction with the AMS and MAA. For example, the Boston area AWM is holding its spring meeting on March 19 at MIT at which time Bhama Srinivasan will give a talk entitled, Have a simple group for tea. Her talk will be followed by a business meeting.

The Executive Committee met in Washington on January 23. Minutes of that meeting appear elsewhere in this Newsletter. However, I would like to report on one aspect of that meeting here which was also reported at the Business Meeting. The Executive Committee has set up a procedure for the election of future officers of the Association. No objection to the procedure arose at the Business Meeting so that unless we hear of serious objections, it will be put into effect this spring. It was decided that the President should serve a two-year term in that office, the term to start on July 1 of the year following the election, and being preceded by a year as President-Elect. In this capacity s/he will also serve on the Executive Committee. The two-year term as President will be followed by a year as Past-President during which time s/he will also serve on the Executive Committee. This will give a President a four-year membership on the Executive Committee. It was also agreed that serving on the Executive Committee will be regional representatives, one from each of the four regions: West, Midwest, South and East. Each will serve for a period of four years with election of one new Sectional Representative being held each year. All newly elected officers will assume their duties on July 1 of the year elected. Nominations will be by self-nomination or nomination by another member. Once the nominations have been received, the Executive Committee will ask the nominees if they are willing to be candidates for the appropriate offices. Those willing to be nominated will form the final slate of officers. It was decided that this spring a President and Representative from the South will be nominated. The list of nominees and a ballot will appear in the April Newsletter. If a runoff election is necessary that will be done at the time of the

May Newsletter. (See last page of this Newsletter for a blank to be used to make nominations.)

We are also much in need of a Treasurer-Editor of the Newsletter. Mary Gray, who has been the Editor for four years, is on sabbatical and is in London this semester. So, please nominate candidates for the offices of President, Representative from the South, and Treasurer-Editor of the Newsletter.

As reported in previous Newsletters, AWM applied last summer for affiliate membership in the Conference Board of the Mathematical Sciences. In order for an applicant organization to be elected, it is necessary that each of the six constituent members of CBMS vote in favor of membership for the group. At the time of the Washington meeting four of the six (AMS, ASL, SIAM, NCTM) had voted for membership for AWM. One, IMS, it seems, had never received a copy of our application, and last, MAA, was to vote on the application at the Washington meetings. Since the application, the Midwest Category Seminar has also applied for affiliate membership. It would seem that this has muddied the waters. The MAA Board of Governors voted to ask CBMS to name a committee to write guidelines for membership before the MAA would be willing to vote on the applications. It is true that the present guidelines are vague, but does one vote guidelines to be applied retroactively? In the Board of Governors meeting an AWM member moved that the two applications be voted on separately. Unfortunately, the vote was 20 to 18 against the motion for membership for AWM. The next meeting of CBMS is scheduled for August which will be after the next meeting of the Board of Governors of the MAA. This means at best a vote on membership for AWM in CBMS cannot occur until the January, 1976 meetings. Why should the Board of Governors of the MAA be so hesitant about voting affiliate membership in CBMS for AWM? Why should mathematicians object to or question the sharing of information on the activities of the mathematical community to another group of mathematicians?

The AMS-MAA Joint Committee on Women in Mathematics, under the chairmanship of Shirley Hill, University of Missouri, Kansas City, met on January 25 in Washington. A short report on that meeting appears later in the Newsletter. Also, the Council of the AMS met in Washington. Mary Gray will submit a report on that meeting for the April Newsletter. The Council voted that "blind refereeing" be tried by the Proceedings as a two year experiment. The experiment is to be started as soon as possible and will be reviewed two years after it is begun. Because there have been cases in the past of discrimination in refereeing, it would seem that it could only help not hinder to have names deleted from papers submitted for publication in professional journals.

The Boston Area AWM is publishing the Newsletter this spring. Suggestions, articles, etc. are welcome. Please send to me at Mathematics Department, Wellesley College, Wellesley, Massachusetts 02181.

Alice T. Schafer

WHY ARE THERE NOT MORE WOMEN MATHEMATICIANS?
by Edith H. Luchins, Rensselaer Polytechnic Institute
AWM Meeting, January 24, 1975

The overflow crowd at the talks testifies to the interest in action programs for women in mathematics. Also attesting to it is the interviewing of some of the panelists for the National Public Radio Program, "All Things Considered." There has been considerable newspaper publicity, including favorable editorial comment, on a project dealing with the underrepresentation of women in mathematics that is being done at Rensselaer Polytechnic Institute under a National Science Foundation grant, administered by the Educational Directorate. I want to thank the AWM for allowing me to report on the project. My thanks are also due to those who are participating in the study. A questionnaire will go out soon to all members of the AWM and your cooperation in answering it will be deeply appreciated.

Why are there relatively few women mathematicians? What has attracted contemporary women to mathematics? What can be done to encourage more women to seek careers in the mathematical sciences? To answer such questions an interdisciplinary, multifaceted approach is being utilized. Comparisons are being made with psychology.¹ Questionnaires and interviews are

¹ While the AWM was meeting, women in art were also meeting in Washington, D.C. It would be of interest to compare their career patterns and problems with those of women mathematicians and women psychologists. A point raised in the discussion period was whether it was not too

specialized to focus on women in mathematics instead of being involved with women's actions programs that have broader scope. Both kinds of programs would be needed to cope with problems particular to women in a given discipline and with others shared by women of several disciplines or encountered by all women.

being used with undergraduate and graduate women majoring in mathematics and psychology and with professional women in both disciplines, as well as with male control groups. This report focuses on answers given by mathematicians.

Female mathematicians have been interviewed to study their career patterns, to determine what factors encouraged or discouraged them in their mathematical studies and careers, what branches of mathematics interest them and why, and to get their ideas on what can be done to attract more women to the mathematical sciences. Male mathematicians also have been interviewed. Most of these interviews have been scheduled at mathematical conventions. Scores of interviews with American and foreign mathematicians were held at the International Congress of Mathematicians (ICM) which met at the University of British Columbia in Vancouver, Canada from August 21 to August 29, 1974. Women mathematicians, about 250 in number and from 27 countries, represented approximately 7% of the 3500 mathematicians who attended the congress. About one-quarter of the female mathematicians were with mathematician husbands who were also attending the Congress and some brought along their children. The largest female delegation to the ICM, consisting of over 100 women, came from the U.S.; the second largest, 35 women, was from France. When asked why there were relatively many female mathematicians in France, one Frenchman said that it was because women have had equality there for over a century. Another factor mentioned was the availability of household help and child-care facilities.² But it

² At the AWM panel discussion a visiting French mathematician said that while academic facilities were better here than in France, she was troubled by the lack of adequate child-care facilities for her young children and by the opinions expressed in the U.S. that she was neglecting or even "killing" her children by not staying home with them.

was also claimed that most female mathematicians there have low ranking, insecure positions, and encounter discrimination similar to that faced by women elsewhere. An analysis was undertaken to study the number and proportion of women delegates to the Congress from various countries and various demographic and cultural factors have been suggested to account for the differences.

When the mathematicians who were surveyed were asked what could be done to attract more talented women to mathematics, some expressed the idea that if more women were encouraged to enter the discipline, then sheerly on a statistical basis there would be more first-rate research mathematicians among them. Some claimed that women were being encouraged to study mathematics and that more younger women were being attracted to the mathematical sciences. Some women said that they did not want to be encouraged, but simply not discouraged. A large number believed that with the job situation what it is, no one, female or male, should be encouraged to become mathematicians unless they dream of mathematics and think of mathematics between dreams -- and in that case they need little encouragement.

One blunt answer given to why there are not more women mathematicians is that they do not think as well mathematically as men. Some insist that it is not that women are not intelligent but that they have a different kind of intelligence (or that they are too smart to go into mathematics). There is a thesis that males are more efficient in the hemispheric cortical functions dealing with abstract thinking and visual space while women have cerebral superiority in language and verbal ability.³ If this difference is genetically determined, it cannot

³ C.J.A. Gray, 3rd Banoff, Conference for Advanced Study of Theoretical Psychology, University of Alberta, London: Academy Press, 1973.

account for cultural differences that have been found. But it may help to explain the differential in performance of females and males on, for example, the Polish language Olympics and the mathematical Olympics, both highly competitive tests. Such results seem to be counter to the argument that women do not do as well in mathematics because of its competitive nature. Another reason given (usually by male mathematicians) was that mathematical research calls for concentration, for absolute devotion, for a single-mindedness that women are not able or are not willing to give. Related to this is the notion that mathematical research is essentially a solitary, a lonely activity, that it requires social isolation, whereas women tend to be more socially oriented, more people oriented. Family responsibility and child care were relatively more often cited by male than by female mathematicians as reasons for the small number of women in mathematics. Some thought that family life is incompatible with good mathematical research but there are living examples to the contrary.

There was considerable agreement that an important factor was our society's conception of mathematics as a male domain, a conception fostered even by educators. Some male mathematicians admit feeling uneasy at the thought of female colleagues or patronizing or protective toward them. Some admit that because of the close relationship between doctoral advisee and advisor, they and/or their wives feel uncomfortable about their having female advisees. Students tell us that college and high school teachers of mathematics expect more of the male than of the female students and that some high school guidance counselors have discouraged girls from studying mathematics -- perhaps because of misapplication of social norms and of averages on vocational tests to the individual case. Clearly there is need for attitude changes.

What can be done to attract more women to mathematics? Fellowships for women, research grants that allow for child care, grants to those who are not affiliated with an institution, have all been mentioned, as have part-time jobs and shared teaching. [One mathematician at the meeting described the sharing of a job by herself and her husband]. Many departments frown on hiring both a wife and husband but it has worked out very well in other departments. While women are encouraged to remain in mathematics by marrying mathematicians or other academic people, job problems are compounded.

Many students said that they did not know what one could do with mathematics as a career except to teach it. Some, especially women, complained about doing mathematics by rote rather than by understanding. Such comments suggest a need to reevaluate what we teach about mathematics and how we teach it. It is hoped that the study will yield suggestions for curriculum changes on the collegiate and pre-collegiate level. It is planned to utilize a historical-cultural approach to mathematics and to apply Gestalt psychological principles to foster the discovery and understanding of structure.

The present interest in women in mathematics can be channeled to encourage more of them to study mathematics. This should result in more students and could provide more teaching jobs and possibly some new teaching methods. Such changes might not necessarily yield more Emmy Noethers or women Fields Medal winners. But they might yield more people, both male and female, with a better understanding of mathematics and its roles.

REASONS QUALIFIED WOMEN AVOID MATHEMATICS: THE ROLE OF THE EDUCATOR IN DEVELOPING MATHEMATICAL CONFIDENCE AND INTEREST

by Maita Levine, University of Cincinnati

AWM Meeting, January 24, 1975

According to the chapter devoted to women mathematicians in Great Currents of Mathematical Thought, women who have left behind a name in mathematics are very few in number -- no more than five. Yet Poincaré described the true character of mathematics as "the feeling of mathematical beauty, of the harmony of numbers and of forms, of geometric elegance. It is a genuinely esthetic feeling, which all mathematicians know. And this is sensitivity." Yet, sensitivity is a quality usually attributed to women. What is it, then, that discourages women from careers in mathematics?

The barriers against women mathematicians have, in fact, even affected such geniuses as Emmy Noether. During the First World War, Hilbert tried to obtain a position for her at the University of Göttingen. He was unsuccessful primarily because of the hostility of the philologists and historians. There was an anecdote often told at Göttingen that to defend Emmy Noether, Hilbert thought it clever to say to the council of the university, "I do not see why the sex of the candidate should be an argument against her appointment as Privat-docent; after all we are not a bathhouse." She was eventually given an algebra course with modest pay.

The study on which I'm working, under a grant from the National Science Foundation, is designed to aid in the identification of reasons why many qualified women do not pursue careers in mathematics.

Unlike areas of endeavor in which different physical or emotional characteristics may account for a lack or overabundance of women, mathematics seems to involve no inherent differences between men and women. Hence, the reasons why relatively few women have chosen careers in mathematics are apparently due entirely to the differing roles which society assigns to men and women. The study is attempting to contribute toward our knowledge of societal patterns by providing data to answer the following questions:

1. Do girls avoid mathematical studies throughout their lives? Do girls avoid mathematics at a continuously increasing rate as they mature? Are there sudden changes, at particular ages, from interest to disinterest in mathematics?
2. What factors discourage girls from studying mathematics? To what extent do educators impose barriers against women or attempt to remove barriers imposed by other segments of society?
3. What factors discourage girls from choosing careers involving mathematics? What role do educators play in shaping these decisions?

The study is confined to mathematics because it is believed that there may be differences in attitudes toward women among the various sciences. In the laboratory sciences, it may be the prevailing opinion that women are not as capable as men in working with heavy or complex laboratory equipment. The tools of mathematics, on the other hand, involve only pencil and paper or computers. It is also believed that the ages at which girls are discouraged from careers in the various sciences may differ. High school graduation requirements may contribute to these differences.

It is hoped that the results of the study will identify the age level at which girls are discouraged from mathematical studies and the major sources of the barriers confronting them. It is conjectured that there is a sharp increase in societal pressure against women in mathematics during the student's high school and college years and that mathematics teachers and guidance counselors contribute toward building barriers against women rather than removing society's barriers.

Four age levels are being used in the study: fourth grade, ninth grade, twelfth grade, and college sophomores. These levels were chosen because they represent significant stages in maturation and because mathematical aptitude and achievement scores on standardized tests are available at these levels.

Four instruments are being developed at each level:

1. An instrument to measure confidence in doing mathematics.
2. An instrument to measure interest in mathematics.
3. A questionnaire to determine future plans to study mathematics and reasons for the decisions.
4. A questionnaire to determine career plans and reasons for the choices.

In addition to the written instruments, interviews will be conducted with a small random sample of girls at each level to probe deeper into the various issues involved. Similar questions will be presented to a sample of women mathematicians -- several of you constitute part of the sample -- to compare their retrospective responses with the responses of the present students. And, further information will be provided by interviewing a random sample of mathematics teachers and guidance counselors or academic advisors at each grade level.

There will then be an attempt to analyze teachers' treatment of their students, their attitude toward women in mathematics, the extent to which educators discourage women's participation in mathematics, and the extent to which attitudes differ among educators of various grade levels.

The first stage of the project, carried out during autumn quarter, involved interviewing six students at each grade level and administering open-ended questionnaires to 20 students at each grade level to assist in generating a set of items to be used in the final versions of the questionnaires.

Among the interesting, enlightening, and sometimes entertaining responses were the following:

- "Confidence more than interest influences one's choice of a career."
- "Girls aren't as talented in mathematics as boys. They're conscientious but not talented. They have no 'spark'."
- "Top grades in mathematics imply intelligence. Top grades in English literature do not imply intelligence. My parents worry about whether a husband out there somewhere won't like me if I'm intelligent."
- "College instructors of mathematics regard girls with humor. If they're there, the instructors will try to get them to pass the course. If they're bright, the instructors are surprised."
- "College instructors of mathematics or physics regard girls with amused tolerance."
- "Girls tend to give up more easily if they cannot work the problems. But, the top girls in a class set the standard for the entire group. The better girls stick out more than

the better boys."

"I went to a coeducational parochial elementary school. I remember an incident that happened when I was in the fifth grade. A boy in the class was caught cheating on a test. He was copying from the paper of the girl sitting next to him. In reprimanding him the nun said, 'Imagine you copying from a girl's paper'."

The collection and analysis of the data, both qualitative and quantitative, are expected to be completed by the end of August. The final report will include a detailed statistical and anecdotal report on the mathematical confidence and interest variables as well as an analysis, based on cross tabulation techniques, of the effects on educational and career decisions of mathematical aptitude, parents' advice, parents' occupations, teachers' advice, guidance counselors' advice, ethnic background, economic level, and concerns about masculinity and femininity.

Finally, it is hoped that an examination of the results of the study will aid in designing programs to encourage qualified girls to pursue careers in mathematics. Special attention might be given to implementing such programs at the age level at which the greatest drop-out of mathematically qualified girls occurs. Attention might also be given to designing in-service education programs for teachers and guidance counselors at the levels at which they exert a negative influence toward girls as mathematicians.

Previous studies dealing with prejudice have indicated that instruments and interviews used to measure attitudes frequently themselves effect changes in attitudes. Although there will be no attempt to measure such changes resulting from this study, it is hoped that the use of the instruments and interviews will, in fact, encourage a greater number of qualified girls to pursue careers in mathematics.

I began with a quotation from Great Currents in Mathematical Thought. I should like to close with a quotation from the same source: "The growth of female education, the overthrow of prejudices, the profound changes in the kind of life and in the role assigned to woman during the last few years will doubtless bring about a revision of her position in science. Then we shall see in what measure she can, as the equal of man, emerge from the role of the excellent pupil or the perfect collaborator, and join those of our scientists whose work has opened new paths and bears the mark of genius."

METAMORPHASIS OF WOMEN IN MATHEMATICS

by Carolyn T. MacDonald, University of Missouri, Kansas City
AWM Meeting, January 24, 1975

I have been working on a mathematics project for women that I feel has been very successful thus far. A year ago the National Science Foundation made available funds for experimental projects designed to study and to overcome barriers to women in science. The University of Missouri-Kansas City received a grant for the project, "Increasing Women in the Sciences through an Experimental Mathematics Project."

Because mathematics is basic to all sciences and because women have not customarily been encouraged in mathematics, the central part of the project has been a two-semester introductory mathematics course for women students.

UMKC is an urban commuter school. Like many metropolitan areas, we have generally poor inner city schools. There is no longer a mathematics requirement for high school graduation, and the Kansas City School District scores on the 11th grade Iowa Basic Skills mathematics test are in the bottom quartile nationally. The University has many older students, many of them women who are returning to school.

Our project has three major goals. The first is to encourage women to plan academic programs in science areas. I have interpreted this more generally as opening career options, including many fields requiring mathematics, such as business, that are not very often selected by women. The second goal has been to assist the women in overcoming academic, cultural, social and personal factors that may serve as barriers to success. And finally, we want to determine whether our program is effective, and to try and develop methods that might be used with women students elsewhere.

At our school, there is only one first semester introductory mathematics course, Fundamentals of Mathematics I, Math 110. There are several options for the second semester, with most students selecting Fundamentals of Mathematics II, Math 120. The sequence is five credits each semester. Math 110 is roughly the equivalent of college algebra, with an emphasis on theory, and Math 120 is trigonometry and analytic geometry. The first semester

enrollment includes students with backgrounds ranging from 0 - 4 years of high school mathematics. About 90% have had first year algebra, 3/4 have had geometry, and about 1/2 have had a third year of high school mathematics. The course is taught in large coordinated sections, containing up to 80 students, with different sections taught by graduate assistants, non-regular instructors, and some regular faculty.

My section consisted of 32 specially-selected students, all women. In the selection of students, I was looking for students who were generally able, but who did not have strong math backgrounds. Their backgrounds were generally lower than the averages I have just cited. About 60% of the students were selected on the basis of freshman files. A student assistant, who had previously taken Math 110 from me, spoke to each student individually during the freshman advising period, presenting the project as being designed to help each student acquire basic skills in mathematics and to open her career options.

About 20% were advanced standing students. These students were referred to me by academic advisers as students who would benefit from special attention. I spoke to these students individually. Generally, this group of students was characterized as being absolutely petrified of mathematics and desperate for assistance. The remaining 20% of the students enrolled accidentally, due to an error at registration, and were permitted to remain in the course.

The women were a heterogeneous group. About half were entering UMKC directly from high school. They came from inner city, suburban, and small town high schools. The remainder were divided between sophomores, juniors, and seniors and included transfer students, women returning to school after an absence from school of up to 20 years. The age range was 17 - 39 years, with half being 19 or under and a fifth being 30 or older. Approximately half had expressed an interest in a science major, broadly interpreted.

I am team teaching the course with Barbara Currier, an advanced doctoral student in mathematics. We both attend class each day, alternating primary instruction in three week blocks. The regular class sessions are supplemented by occasional guest lectures, counselling sessions, and tutoring sessions.

I was somewhat apprehensive at the start. To add to this there was massive confusion the first day, due to an error at registration. More than twice as many students as expected showed up, including a number of men students. This took quite a bit of straightening out. I was concerned that I had stacked the course with too many potentially marginal mathematics students, too many that were scared of math. I had had students like this before who had been very successful, but I was concerned whether a class could absorb more than a few such students without real problems. Would the class have almost no good students and be a class dominated by very average students? To add to my concerns, we discovered that the backgrounds of many of the students were worse than we had anticipated. There was much more diversity than we had expected in the levels of the various students.

I would like to comment here about my choice of a title for this talk, "Metamorphosis of Women in Mathematics." After outlining my concerns above, let me point out that these women turned out to be the best group of students that I have ever had. I was almost embarrassed by the high grades I ended up giving.

As a text we used Keedy and Bittinger, Essential Mathematics, with a number of supplementary materials. It was necessary to spend the first month on arithmetic. This was integrated with the use of the slide-rule and many practical exercises. I got a number of ideas from a friend at a neighboring college, Betsy Berman. We figured out what size air-conditioner to get for a particular size room, how many hours it would take to get to different locations traveling 55 miles per hour, etc. Instead of impeding class progress, the arithmetic review enabled us to ultimately cover more material and in a more thorough manner than the other sections. It built a good basic background and gave many members of the class the strength and encouragement to proceed. As an example, at the end of the first month one of the women informed me proudly that she had been able to help her eighth grade son with his mathematics homework, and at the beginning of the semester she would never have thought she would ever be able to do that.

There was a very special atmosphere in the class. Barbara and I encouraged the students to come to us for help. Friendships developed as students worked together. Each day the class was preceded by a voluntary noon hour tutoring session staffed by an undergraduate student, held in a lab with tables seating 4 - 6 persons. This helped develop further rapport. As one student described the class and her classmates on a questionnaire at the end of the

semester, "We were like a big family."

After a great deal of prior thought on the matter, I had decided to have the class consist of all women. I did this because I had found in previous classes that some women, especially the older ones, were more hesitant about asking questions and appearing stupid when male students were present. My own first reaction to having all women students was to discover that it was harder to learn the names of the students. It took me a little over a week instead of a couple of days. Overall, there was a very good feeling present in the class. One woman who audited the class after having taken a regular Math 110 course from me the previous year remarked to me that this year's class certainly was different. One common comment that I and some of the students received from others was that an all-women mathematics class must be remedial. I find that to be rather interesting, for I think that if the class had been all male, that the assumption would have been instead that it must be an advanced class. The only negative reaction I received about the class was from students who were angry that they could not take a similar course the next semester.

As I mentioned before, we began the course with an arithmetic review. This was followed by elementary algebra, with an emphasis on applications. We then covered the normal college algebra topics, including three weeks on counting problems, elementary probability, and statistics. There were weekly 15-minute open-book quizzes, regular one-hour exams every three weeks, and a comprehensive final. Before each exam, there was a review exam that was handed in and graded. Students who studied and mastered material that they had previously done poorly on were permitted to repeat exams. If they did better, only the later score counted; if they did worse, the two scores were averaged.

Grades were assigned on a percent scale, 90% - 100%, A; 80% - 89%, B; etc. The normal grade distribution in standard sections, including my own classes during the previous two years, runs about one-fifth each of A, B, C, combined D and F, and Withdraw. In our experimental section, the grade distribution was 53%, A; 25%, B; 6%, C; 9%, D; and 6%, F and W. In addition, I am convinced that the students in the experimental section learned more and had a better understanding of mathematics than their lettergrade counterparts in other sections, including ones I had taught before. At the end of the semester, a questionnaire was given to all students in all sections, with five choices for each question, ranging, for example, from "much better" to "much worse." Twice as many students in the experimental section as compared to the other sections expected their course grade to be much better than previous mathematics grades, reported their understanding of mathematics to be much better, and their interest in mathematics to be much higher than at the beginning of the course. Three times as many said they would recommend to friends that they "really ought to take Math 110."

We found that it is possible to set up an encouraging and supportive environment where women students, no matter what their backgrounds, can succeed. There are a number of different factors that may have contributed to success. An important difference is the instructor. In our class, the overall instructor rating by the students was 84% excellent and 12% good, as compared with 48% excellent and 40% good in the other sections. But there is also a great difference in the content and format. We used a different book, which 72% of the students rated as one of the best math books they had ever had, as compared to 9% for the book used in the other sections. There is a real problem in trying to analyze the different variables - there is the fact that the students knew they were selected for a special section, there were different instructors, a different book, a different format, extra assistance available, etc. We will be doing some additional study as we continue with the second semester of the course.

I would like to close with a story about one of the students in the class. She had stated on her application for admission to UMKC that she was interested in the field of dentistry. She did not want to be a dentist, but rather a dental hygienist or dental lab-technologist. That statement intrigued me and caused me to select her as a possible participant. This young woman turned out to be one of our best students. At the end of the semester she indicated to me that she had begun considering dentistry rather than dental hygiene. If she enrolled in the second semester of the math course, that meant that she was aiming for later admission to dental school; but if she did not enroll, that meant she was proceeding with her original plans to be a dental hygienist. On the first day of the second semester, I walked in to class and saw her sitting in the front row. I exclaimed, "You are going to be a dentist!" To me, that is what this project is all about.

Report of Lenore Blum's talk on January 24 will appear in the April Newsletter.

WOMEN - AND MATHEMATICS, PHYSICS AND TECHNOLOGY?

WOMEN - AND RESEARCH?

by Else Hoyrup, Mathematics Institute,
Copenhagen University

Part IV - Sex differences regarding spatial concepts.

Many psychological studies have revealed sex differences in regard to spatial concepts. As small children, boys and girls perform equally well on tests of spatial relations, but from the start of school and thereafter boys gain a larger and larger advantage.

Sex differences concerning spatial perceptions (and mechanical intuition) are obviously connected with the kinds of games and toys and sorts of play in which boys and girls are encouraged.

To be sure, playing with dolls involves spatial configurations just as does building with blocks or erector sets. Still, the play possibilities with dolls are very limited from a spatial point of view, because of the dolls' relationship to the human pattern. Girls normally do not experiment with rearranging the parts of the body into new configurations.

In playing with blocks and with some mechanical toys there are more possibilities for varied, constructive and experimental spatial experience. Many girls today also play with blocks, but not so much with, for example, electric trains and the accompanying construction of lay-outs. But even more important than the sort of toys children use is that girls are not supported as strongly as boys in experimenting with varied forms and shapes. Apart from the early years of childhood, when both girls and boys create fantasy figures, girls for the most part build houses and the like, and not, for example, machines. (The Lego company, incidentally, in order to increase sales has now come out with a new type of blocks designed for making doll houses for girls.)

Not many girls are given any training in the use of tools, even though they are now allowed to take woodworking in place of needlework in school. It is part of the "woman's role", especially in the middle class, to be so helpless that one must ask a man for help with anything that has to be done with tools. (The working class cannot afford this sort of luxury role-playing, and in the upper class it is not expected that women should do any sort of work in the home--all that is normally left to servants.)

Finally, another factor is that boys are allowed to be more violent with their toys (and in their play in general), and that they are more expected to investigate and manipulate many sorts of things. Girls, on the other hand, must take more care to be well-behaved, and perhaps to look pretty in their impractical clothes. (This does still apply today for many girls--mothers are often tempted to use their little daughters as dressing-up dolls.)

ANOTHER SOLUTION TO THE TWO-CAREER FAMILY

After reading, in the Association Newsletter, about the manner in which several of our colleagues have solved their work-family problems by a "two city" solution, it occurred to me that some of our members might be interested in a very different solution to the problems of combining career and family, which has worked particularly well for me. Perhaps, by sharing some of my experiences, I will encourage others to try a similar approach.

After obtaining BA and MA degrees, I spent some 5 or 6 years actively pursuing a career in Industrial Mathematics. My work was challenging and enjoyable, and as the birth of my first child approached I was determined to continue--indeed, I could not visualize any other kind of life. My husband was encouraging, my employers were agreeable to a part-time arrangement, and it seemed as if all would go well. However, by the time our third child arrived 5 years later, my interests and energies had changed radically, and had gradually become focussed almost entirely on my growing family. In spite of an extremely cooperative employer, the work had just lost its meaning; putting in a day or two a week, with interruptions for children's illnesses, a professional husband's sabbatical, the baby sitters' vagaries, the second grade book fair, etc. etc. took its toll, and my work was no longer a serious commitment. I know this experience was not unique to me or to my generation--I see it being repeated today. At that particular moment in my life, mathematics was just not what was really important to me.

By the time my youngest child began nursery school, the pendulum began to swing back

again--I was less needed at home, but also really rusty--a potentially disastrous combination! That was when I decided to take a beginning graduate course in mathematics, one night a week--not a very big decision, but clearly one I could handle. Even so, the first exam was a hurdle (the very idea of a "grade" was offensive). I had forgotten most of what I once knew, but to my surprise it was really still there, waiting to be recalled. Maybe I was lucky not to have had an earlier Ph.D. (One really peculiar experience occurred when I was stuck on a delicate point in real analysis, and then found a marginal note in my old copy of Courant's Calculus on that very same question, pencilled in 15 years earlier!) One course was soon upped to two, and my involvement deepened. I applied for a fellowship, and got a tremendous lift when I was awarded one if I would return to school as a full-time student--that was a real vote of confidence, also a push, and finally a genuine help because it paid the much-needed housekeeper. By the time I received my Ph.D. (at age 41) I was thoroughly committed to Mathematics, and happily there was no longer any need to choose between career and family because (with a little luck and juggling) I could handle both.

On the negative side: it is surely harder for a middle-aged woman to find a decent job than it is for a young man. In that I was lucky to have had teachers and colleagues who took an interest, to have been able to do publishable research, and also (no small part of it) simply to have been at the right place at the right moment. Thus, while I am now fortunate in having found a permanent position in a school where I have respect and love for my students, colleagues and institution, and where conditions are such that it is possible to work productively, I know that this need not have been the case. I feel a genuine concern for my own graduate students, because it is not clear whether they will be equally fortunate in this very weak job market, irrespective of talent, or of whether they are male or female. But, given that situation, it surely helps if you really like what you are doing, and in that the older woman who has elected a career can have a hidden strength because she is free of some of the external pressures which can be disastrous to a young person.

While I could not live in this world without being aware of certain characteristic attitudes of our society toward women, and toward old vs. young people, and of women toward their work, and of older people toward active younger ones, and visa versa, all this seems to me to matter little when two people focus their energies on a mathematical question of mutual interest. I honestly feel that age and sex (and you can add race, color, nationality, culture, language or what have you) become total non-issues when I have something to say to another mathematician, and am genuinely interested in the response. In this, I am equally certain that I judge correctly that they are non-issues to others. That brings me to the second and really most rewarding aspect of this late-blooming career, and that is: my best friends are surely mathematicians. There is simply no better way to share in another person's essential humanity than to share in a common piece of creative work.

If that sounds too pat and easy, let me assure you that it was not and is not. However, in my mind the real difficulty with a career in mathematics is that mathematics is hard, and to be a mathematician (and in particular a teacher and a research mathematician) one must be able to face one's continuing, frustrating ignorance and stupidity, day after day after day. The extent to which one can accept that ignorance and work at it has little to do with either sex or age, and is a daily battle. The only reason to continue to fight it is if you feel that, underneath, it is really more fun and more richly satisfying than anything else in the world.

Author of this letter wishes to remain anonymous

REPORT ON THE AWM MEETING HELD AT VANDERBILT UNIVERSITY, NOVEMBER 9, 1974

A meeting of the AWM in connection with the Southeastern Section of the AMS meeting at Vanderbilt University on November 9, 1974: Elizabeth Papoušek of Fisk University and Lida K. Barrett, of the University of Tennessee, Knoxville, made arrangements for the informal meeting of the AWM at the time of the AMS meeting in Nashville. An item concerning this meeting was included in the AMS NOTICES announcing the meeting. Arrangements were made to have a classroom adjacent to the general meeting area at 10:00 a.m. on Saturday morning. A group of approximately 15 people gathered and discussed in an informal manner the role of women in mathematics in the Southeast. Information was shared concerning affirmative action programs, actions at various schools, and legal recourses for women who felt they had been discriminated against. Plans were made for an additional informal gathering at the Spring meeting.

Lida K. Barrett

MINUTES OF EXECUTIVE COMMITTEE MEETING, JANUARY, 1975

The Executive Committee of ANM met for lunch in Washington, D.C., on January 23. The following is a brief account of the meeting.

Proposals to foundations for grants to ANM were briefly discussed.

It was agreed that ANM is now established enough to elect its own officers, and that any member could nominate any other member, including him- or herself. All nominations should come with the address of the nominee. [Editor's Note: See Report of the President in this Newsletter.]

Alice Schafer reminded us that she is running a Speakers Bureau. She needs the names of those who wish speakers. Alice would very much like to list the names of volunteer speakers, together with their proposed topics, in the Newsletter.

Possible subjects and members for an ANM panel discussion in connection with the AMS summer meeting in Kalamazoo were mentioned. The consensus was that a panel of older, more established (not recent Ph.D.) women mathematicians would be the most interesting.

Evelyn Boorman

OF POSSIBLE INTEREST, by Judith Roitman

The U.S. Center for International Women's Year publishes a newsletter which includes a calendar of IWY-related events; they have a speaker's bank (which needs speakers). Address: 1630 Crescent Pl. NW, Washington, D.C. 20009.

Many universities regularly publish job openings. Two that have come to our attention are the University of Minnesota and the University of Miami.

Today Publications and News Service, Inc. publishes a newsletter WOMEN TODAY which summarizes activity from eclectic sources (did you know that Clairol Inc. has prepared a pamphlet entitled "Educational Financial Aid Sources for Women?") and tells you where to find out more. They also publish the WEAL Washington Report, a legislatively-oriented newsletter, and the Women's Organizations and Leaders Directory. The address is National Press Building, Washington, D.C. 20045.

The Massachusetts Governor's Commission on the Status of Women (100 Cambridge St., Boston, Mass. 02202) publishes a newsletter that not only publicizes their own activities but also tries to act as a clearinghouse for information on women's events from conferences to women-owned craft stores. Does your state have such a commission? What's it doing?

The Women Law Reporter will cost you or your library \$275 a year, but this includes full texts of the major judicial, legislative, and administrative documents that affect women.

The Spokeswoman is another newsletter, based in Chicago. The issue we've got ranges from Dalkon shields to earnings statistics and includes book reviews and high-level job advertisements (dean, department head, etc.). \$9 for individual, \$16 for institutional subscription. Address: 5464 South Shore Drive, Chicago, Illinois 60615.

The Modern Language Association has many publications on women in academia. You can get their list by writing to the MLA Commission on the Status of Women in the Professions, T21, Staten Island Community College, CUNY, Staten Island, New York 10301.

Two books: Woman in the Year 2000, ed. Maggie Trip. Available from Arbor House, 641 Lexington Avenue, New York, N.Y. 10022, for \$8.95.

Second Careers for Women, Vol. II, available from Stanford University, P.O. Box 9660, Stanford, Calif. 94305, for \$3.95. (Make checks out to Second Careers for Women, Stanford University.)

You can get both the official summary and the December 12, 1974 HEW memorandum on the subject of affirmative action from Commerce Clearing House, Inc. (items #5238 and #1647). I think they're in Washington, D.C. - does anybody know their exact address?

The University of Pittsburgh had a conference on Child Care last month. How did it turn out? Do you know of other institutions which had similar conferences?

The second national convention of two-year college mathematics educators will be held in Chicago on October 29 - November 1 at Oakton Community College, 7900 North Nagle, Morton Grove, Ill. 60053.

Back in April, 1974, Le Monde had an article called "Can women do mathematics?" which was a sympathetic report on the situation as presented at a seminar at Orsay.

Finally, the National Civil Service League (whose motto is "efficiency-quality-economy in government management") is sponsoring a series of workshops on Management Strategies in Affirmative Action. Their covering letter suggests that if you participate you will "confront

some interesting feelings you have quietly had about women. Or men. Or others." Is your institution sending people to things like this? If so, what are the results?

LETTER TO THE EDITOR

I am sending you reprints of decisions by the Equal Employment Opportunity Commission. Your readers can get information on the EEOC and laws on sex discrimination without charge by writing or calling the closest branch of the EEOC. If a woman believes she has been discriminated against, she can appeal to the AAUP or the American Mathematical Society Committee on Academic Freedom, Tenure, and Employment Security. But she might well consider also talking immediately to an EEOC official. The EEOC has power to subpoena documents and testimony. They can order reinstatement with back pay if there is reasonable evidence of discrimination. They keep their decisions confidential--that is, they do not reveal names. If their order is not obeyed, they sue the respondent with Justice Department attorneys. A woman does not need a lawyer to deal with EEOC. The main drawback is that EEOC has a backlog of cases and may take two years to get to a case. If a woman is in a hurry, she might consider a lawyer.

You may wish to check the above information by consulting with an EEOC official. It might be of interest to your readers to print some of the case reports, which illustrate the law better than generalities. The EEOC decisions are published in the journal Commerce Clearing House. I wish these reprints could also appear in AMS Notices.

Name withheld at request of contributor

JOBS

University of Alabama in Birmingham. Assistant or Associate Professor of Mathematics. Ph.D. and promise in research plus interest in undergraduate and graduate teaching required. Preference for Applied Math or Logic, but all applications considered. Contact R. J. Crittenden, Chairman, U. of Alabama in Birmingham, Birmingham, Ala. 35294.

California State College, San Bernardino. One-year lecturer position in the School of Natural Sciences. Ph.D. in mathematics required. Applicants should have a specialty in area of analysis, algebra, topology, probability or geometry. Some undergraduate teaching experience desirable. Salary (\$11,880-\$14,448) commensurate with experience. Send application to: Dr. James D. Crum, Dean, School of Natural Sciences, California State College, San Bernardino, 5500 State College Parkway, San Bernardino, CA 92407.

California State University, Chico. Assistant Professor of Business Administration. Equivalent of possession of masters degree; commitment to complete doctoral studies in business or related fields, demonstrate teaching effectiveness, ability to relate to and work with minority groups. Also, work experience at managerial level is desired but not essential. Contact: Chairman, Faculty Recruiting Committee, School of Business, Calif. State U., Chico, West First and Normal, Chico, CA 95926.

California State University, Fresno. Full-time twelve-month position. Dean of the School of Education. Salary Range \$25,656-\$31,188. Ph.D. required with experience qualifying s/he for rank of associate or full professor. Should have demonstrated exemplary scholarship and teaching excellence, including experience with publish schools and at college or university level. Should have recent administrative experience (within last five years). Applications must be received by April 15, 1975. Send letter of application, complete resume and confidential papers to: M. Marty Santigian, Chairman, School of Education Dean Nomination Committee, Office of the President, Calif. State U., Fresno, Fresno, CA 93740.

California State University, Long Beach. One year full-time and temporary part-time positions in Department of Mathematics. Ph.D. required for full-time appointments, research encouraged but primary emphasis on teaching. Ph.D. or equivalent in mathematics or computer science given first priority for part-time appointments. Send application to: Dr. Thomas A. McCullough, Chairman, Dept. of Math., Calif. State U., Long Beach, 6101 E. Seventh St., Long Beach, CA 90840, by April 1.

University of California at Berkeley. Assistant Professor in EECS Dept. with interest in teaching and research in the area of physical electronics. One possible area of interest to them is development of subsystems for peripherals for new modes of communication e.g. graphical. Possibility of tenure. Ph.D. or academic or industrial experience providing comparable stature required. Contact: Prof. D. J. Dakrison, Dept of Electrical Eng. and Computer Sciences, Univ. of California, Berkeley, CA 94720.

University of California at Berkeley. Assistant Professor in EECS dept. with interest in teaching and research in the area of Computer Software, specifically: Software Engineering, Programming, Language Design and Implementation, Operating Systems. Possibility of promotion to tenure. Ph.D. required. Send resume to: Professor R. M. Karp, Computer Science Division, Dept. of Electrical Engineering and Computer Sciences, University of California, Berkeley, CA 94720.

University of Calif at Berkeley. Assistant Professor in EECS Department with interest in teaching and research in area of Digital Hardware, specifically, primary area of interest in Architecture of Microprocessors and/or memory systems, some knowledge of L.S.I. and Integrated Circuits is desirable. Applicants should have Ph.D. or academic or industrial experience which provides comparable stature. Contact Professor R. M. Karp at address above.

University of Connecticut. Director of the Women's Studies Program. Qualification: Ph.D. or equivalent and evidence of prior involvement in activities related to Women's Studies (e.g. teaching, publication, administrative experience, leadership in public or professional assoc., participation in feminist groups). Send resume to Dr. Mara Mayor, Univ. of Conn., Trout Brook Drive, West Hartford, CT 06117. Tenure track appointment possible.

University of Delaware. Chairperson, Mathematics. Requirements: Ph.D. with research interest, sound teaching experience and aptitude for administrative duties. The department with research interests in applicable mathematics and classical analysis has 25 members. Contact: Dr. R.N.Hill, Dept of Physics, Univ. of Delaware, Newark, Delaware 19711, Tel 738-2651.

University of Delaware. Faculty position in Digital Systems and Electrical Engineering. Ph.D. with emphasis in computer architecture and systems, and in switching theory. Send resume to Chairperson, Dept of EE, Univ. of Delaware, Newark, Dela. 19711.

University of Delaware. Assistant Mgr., Gen'l accounting. Requirements: B.S. in accounting (or equivalent) with 1 - 3 years of accounting experience including familiarity with computer based systems. Contact (immediately) Ramona Adams. Tel: 738-2174.

University of Illinois at Chicago Circle. Department Head, Mathematics. Applicants for this position must have a distinguished record of scholarship and teaching, and preferably, a demonstrated administrative capacity. Send curriculum vitae and list of publications by March 21 to: Dr. J.C. Johnson, Associate Dean, Chairman, Mathematics Search Committee, College of Liberal Arts and Sciences, Univ. of Ill., Chicago Circle, Box 4348, Chicago, ILL 60680.

University of Illinois at Urbana-Champaign. Assistant Professor of Mathematics. Qualifications: Ph.D. in mathematics and substantial research accomplishments. Contact: Professor Paul T. Bateman, Head, Dept. of Math., Univ of Illinois, Urbana, ILL 61801 by March 15. Phone 217/333-3352.

Knox College. Instructor/Assistant Professor in Dept of Math. and Computer Science. Two year appointment, extendible but tenure unlikely. Recent Ph.D. in statistics or mathematics with strong minor in statistics. Ability in computer science desirable. Contact: Robert F. Bryan, Chmn, Dept. of Math. and Computer Science, Knox College, Galesburg, ILL 61401.

Western Illinois University. Provost and Academic Vice President. Candidate should have earned doctorate and evidence of scholarly achievement as well as successful experience in teaching and administration. Contact: Spencer H. Brown, Chairman, PAUP Selection Committee, Western Illinois University, Macomb, ILL 61455.

Indiana University. Senior position in applied mathematics, differential equations or probability. Candidate must have exceptionally strong research background and experience in working with grad. students. Send credentials to: Maynard Thompson, Chairman, Dept of Math, Indiana Univ. Bloomington, Indiana 47401.

Iowa State University. Assistant Professor in Department of Statistics. Ph.D. in statistics, economics or business administration required. Clear indication of interest in teaching economic statistics effectively at undergraduate and graduate level essential. Send a curriculum vitae, including names of three references and a transcript to: Wayne A. Fuller, Chairman Search Committee, Department of Statistics, Snedecor Hall, Iowa State University, Ames, Iowa 50010.

Digital Equipment Corporation. Sales Representative. College degree or equivalent; Electrical Engineering, Computer Science, etc. A minimum of one year of professional level tasks in one or more of following: design of computers or electronic or electrical equipment or mechanical instruments or control systems, computer software, writing and debugging programs in assembly or high level languages, laboratory research or teaching. An advanced degree may substitute for this. Also two or more years successful experience in sale of above. Salary 13 - 20k + car and expenses. Contact: David F. Hall, Jr. Senior Personnel Rep., Digital Equipment Corp., Lanham 30 Office Bldg., 5900 Princess Garden Pkwy, Lanham, MD 20801.

Northeastern University. Three full time positions in Math. Dept. Ph.D. required. Contact: Chairman, Math. Dept., Northeastern University, 360 Huntington Ave., Boston, MA 02115.

University of Maryland, College Park. Appointment starting September 1975 to possible tenure rank. Send application to: J.F. Goldhaber, Chairman, Dept of Math, Univ. of Maryland, Div. of Mathematical and Physical Sciences and Engineering, College Park, MD 20742.

University of Massachusetts (Boston). Assistant or Associate Professor. Primary interest is for Applied Statistics and/or computing, but particularly strong candidates in other fields will also be considered. Strong mathematical and teaching ability is required. Send resume and letters of recommendation to: Robt. Seeley, Math. Dept (College 1) University of Massachusetts, Boston, MA 02125.

University of Massachusetts (Boston) College of Professional Studies. New undergraduate program in management being set up. Candidates should have significant experience either as teachers or practitioners in the fields of business and mgmt. An advanced degree in either a professional or academic field would also be important. Women with mixture of academic and practical experience would be very attractive candidates for positions here. Contact: Dean Richard M. Freeland, College of Professional Studies, University of Massachusetts/Boston Harbor Campus, Boston, MA 02125

Wellesley College. Assistant Professor, two-year appointment, Ph.D. required. Do not apply if already taught more than 2 years without Ph.D. or taught 3 or more years after Ph.D. Salary: approximately \$12,700. Contact Torsten Norvig, Chairman, Department of Mathematics, Wellesley College, Wellesley, MA 02181.

Milton Academy. Mathematics Teacher Grades 9 to 12, Milton Academy, Milton, MA 02186. Graduate degree required, teaching experience preferred. Write Margaret A. Johnson.

St. Cloud State College. Administrative Assistant to the Vice President for Administrative Affairs. Must have strong background of major administrative experience in institutions of higher education. Minimum of Master's Degree required with two years of practical administrative experience. Applications should include vita and transcripts and several letters of recommendation should also be sent to: Mr. William Radovich, Vice President for Administrative Affairs, St. Cloud State College, St. Cloud, MN 56301. Phone: (612)255-2286. Deadline: March 7.

Anheuser-Busch, Inc. Marketing Staff Analyst with MBA in technical discipline. Should have 1-2 yrs. experience, strong management science/statistics background, knowledge of financial analysis techniques and enthusiastic interest in solving marketing problems. Send resume including salary history to: Anheuser-Busch, Inc., 721 Pestalozzi St., St. Louis MO 63118.

University of Missouri-Kansas City. Assistant/Associate Professor of Physical Science. Ph.D. in one of the sciences or mathematics with active interest in history and philosophy of science or Ph.D. in such. Teaching experience highly desirable. Joint appointment with department of specialty. Contact: Dr. Carolyn MacDonald, Physical Science Program, Univ. of Missouri-Kansas City, Kansas City, MO 64110.

University of Montana. Director of Management Information Services. Masters degree or doctoral degree preferred. Must have had experience with and will be responsible for administrative data processing, institutional research, budget planning, the computer center and mgmt info servs. development. Also, must have experience with a third generation, time sharing computer facility. Contact: Ralph J. Fessenden, Dept of Chemistry, Univ. of Montana, Missoula, Montana 59801.

Dartmouth College. Assistant Professor of Mathematics. Ph.D. with strong interest in both teaching and research. Contact: Richard H. Crowell, Chairman, Dartmouth College, Hanover, NH 03755. Tel (603)646-2415.

Los Alamos Scientific Laboratory. The Computer Science research group seeks scientists (Ph.D.) for positions as either staff member or group leader. Current research interests of group include: programming languages and methodology, optimizing compilers, interactive graphics, algebraic manipulation, combinatorics and algorithms. They would like to add to current capabilities in such areas as operating systems, computer networks, performance measurements. U.S. Citizenship required. Send complete resume or request application from: R. Lynn Wilson, Recruiting Supervisor, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, New Mexico 87544.

Colgate University. Faculty position in newly developing academic program in computer information systems. Primarily interested in a young person with a degree in mathematics and some background in automata theory and/or operating systems who is interested in creation of academically strong program and undergraduate teaching. Contact: Thomas E. Brackett, Director, Colgate Computer Center, Colgate University, Hamilton, NY 13346.

employment INFORMATION for mathematicians

is published six times each academic year: October, December, February, April, June and July. Each issue contains listings of departments in the mathematical sciences in the United States and Canada grouped under one of three headings: Those with positions to be filled, those with no open positions, and those not responding to requests for information. A fourth section includes information on governmental, industrial, and foreign positions.

Department heads provide information (by a specified deadline) on available openings, or state that no openings are available on preprinted return postcards that are mailed to them every other month. A statement that no positions are available may relieve the department of the obligation to answer letters from applicants, thus decreasing the burden of correspondence.

"The Council of the AMS adopts the principles that all positions in the mathematical sciences shall insofar as practicable be advertised, and that the standard place for the advertisements to appear is the publication *Employment Information for Mathematicians*." This resolution was passed at the October 25, 1974, meeting of the Council of the American Mathematical Society.

The price for individual subscribers to the EMPLOYMENT INFORMATION FOR MATHEMATICIANS is \$20. Subscription prices for departments are based on the number of doctorates granted; details may be obtained by writing to the Mathematical Sciences Employment Register. EIM is mailed via Second Class mail (normal delivery time to most points in the United States and Canada is two weeks) unless a subscriber indicates in advance a willingness to pay a service charge for First Class or Airmail delivery. Further information about special mailing may be obtained from the Register office.

Checks should be made payable to the American Mathematical Society and sent to

Mathematical Sciences Employment Register
Post Office Box 1571, Annex Station
Providence, Rhode Island 02901

Columbia University. Assistant Professor of Operations Research in the School of Engineering & Applied Science. Responsibilities: teach courses in Applied Probability Dynamic Programming and general Operations Research. Doctorate in Operations Research, Mathematics or Mathematical Statistics required. Send resumé & reference to: Professor Cyrus Derman, 312 S.W. Mudd Bldg., Columbia Univ., NY, NY 10025. Deadline: March 15.

New York University. President. Contact: Presidential Search Committee, New York University, P.O. Box 761, Cooper Station, New York, NY 10003.

SUNY at Buffalo. Possibility for positions at the Associate Professor and Assistant Professor level as regular or visiting appointments for Fall, 1975. Submit application to Dr. John R. Isbell, Acting Chairman, Department of Mathematics, SUNY at Buffalo, 4246 Ridge Lea Rd., Amherst, NY 14226.

Syracuse University. Vice Chancellor for Student Programs. Required qualifications include demonstrated skills in working with young people and in management within an academic environment. Contact: Bradley J. Strait, Chairman, Search Committee, Electrical and Computer Engineering Dept., 113 Link Hall, Syracuse University, Syracuse, NY 13210.

Union College. Assistant Professor of Computer Science. Applicants should possess (or be close to) a Ph.D. in Computer Science, Engineering or Mathematics. Teaching experience desirable but not essential. Must be able to teach one or more of the following: information storage and retrieval, operating systems, computer languages, translations & automata theory. Send application and resumé to: Professor C. F. Goodheart, Chairman, Dept. of EE and Computer Science, Union College, Schenectady, NY 12308.

Sherwin Williams Co., Cleveland, Ohio. Several positions. Requirements: B.S. in Computer Science, mathematics or business administration and 4 or more years experience in design of computer manufacturing, marketing distribution or financial systems. Experience with IBM 370-145 and Mark IV and/or COBOL preferred. Direct resúmes to: Mr. D. Roger Waller, Corporate Recruitment and Placement, The Sherwin Williams Company, 101 Prospect Avenue, N.W., Cleveland, Ohio 44115.

Denison University. Computer Scientist. Contact: D. D. Bonar, Dept of Math Sciences, Denison University, Granville, Ohio 43023.

University of Oklahoma. 4 positions. **Algebraist** with research interests in commutative or non-commutative ring theory, algebraic geometry, linear algebra or algebraic number theory. **Functional Analyst** with preference given to candidates complementing present departmental interests: ordinary and stochastic differential equations, abstract differential systems, control theory. **Topologist** with research interest in one or more of the following: geometric topology, rings of continuous functions, abstract space topology. **Statistician** with knowledge of several areas of statistics and probability and strong mathematics background. For all of the above, Ph.D. required and applicants should combine excellent teaching ability with outstanding research potential. Contact: Gene Levy Chairman, Dept of Math., Univ. of Oklahoma, 601 Elm Ave., Rm. 423, Norman, Oklahoma 73069.

Shippensburg State College. Assistant Professor of Computer Science. Ph.D. in Computer Science required. Preference given to persons having record of teaching experience, research potential, and (non-teaching) experience. Candidates must submit graduate and undergraduate transcripts, reprints of selected publications (if any) and at least 3 letters of recommendation. Apply to: Dr. James L. Sieber, Chairman, Dept of Math, Shippensburg State College, Shippensburg, PA 17257. Closing date: April 1, 1975.

College of Charleston. 2 positions. Assistant Professor of mathematics to teach applied math. operations research or computer science. Ph.D. required. Teaching experience desirable. **Instructor in Mathematics**, masters degree in mathematics and some teaching at college level required. Send resumé to: Hilburn Womble, Dean of the College, College of Charleston, Charleston, SC 29401.

University of Texas at Dallas. Faculty positions in Applied Mathematics, Computer Sciences and Statistics. Rank open. Qualification: Ph.D. demonstrated competence in teaching and research, interdisciplinary interest preferred. Send letter detailing salient interests, experiences and current vita to: Chairman, Mathematical Sciences Recruitment Committee, The University of Texas at Dallas, Station 15D, Box 688, Richardson, TX 75080. Indication of ethnicity and sex for affirmative action requested not required.

The University of Texas at Dallas. Faculty positions in mathematics and science education. Rank open. Qualifications: Ph.D. or professional degree, strong preparation in discipline and evidence of teaching and research competence. Send letter detailing your salient interests and experiences and current vita to: Chairman, Education Recruitment Committee, The University of Texas at Dallas, Station 15E, Box 688, Richardson, TX 75080. Indication of ethnicity and sex for affirmative action requested not required.

Fairhaven College of Western Washington State College, Bellingham, Washington 98225. Position of Academic Dean. Comprehensive job description available. Deadline March 31, 1975.

Washington State University. Assistant Professor of Applied Mathematics. They seek a person with a doctorate whose research involves quantifying and studying from mathematical point of view phenomena arising in the natural sciences and engineering. Prefer life sciences but would consider experts in stochastic processes and/or continuum mechanics. Submit detailed curriculum vitae, academic record and the names of at least 3 references to: Calvin T. Long, Chairman, Dept of Pure and Applied Mathematics, Washington State University, Pullman, WA 99163.

The American University. Position for Assistant or Associate Professor for September, 1975. Ph.D. in Computer Science or Math with background in Computer Science for teaching and research on graduate and undergraduate levels. Contact Dr. Basil P. Korin, Chairman Department of Mathematics, Statistics, and Computer Science, The American University, Washington, D. C. 20016.

Gallaudet College. Two positions. Instructor of mathematics at liberal arts college for the deaf. M.A. in mathematics and Ph.D. in mathematics or related area preferred. Prior experience with deaf desirable but not necessary. Paid to attend mandatory summer program to learn to communicate with deaf students. Contact: Dept of Math., Gallaudet College, Washington, D.C. 20002, by April 1.

University of Toronto, Toronto, Canada. Assistant or Associate Professor positions in Mathematics, Applied Mathematics or Statistics anticipated. Ph.D. and evidence of excellence in teaching and research required. Contact Chairman, Department of Mathematics, University of Toronto, Toronto, Ontario, Canada M5S 1A1, if possible before February 28, 1975.

The fee for each regular advertisement to appear in the Newsletter is \$5 per issue. With our low dues structure and the high cost of publication, this is the minimum fee we can charge in order to break even. On the other hand, if a college, university or organization cannot afford the fee, then we will publish the advertisement without charge.

ORGANIZATION OF INTEREST

Catalyst is a nonprofit organization founded in 1962 by five college presidents (those of Smith, Wellesley, Sarah Lawrence, Lawrence and Mills) to expand career opportunities for college-educated women. Catalyst operates a Roster which is open to women age 24 and over who have completed at least one year of college and who are seeking administrative, managerial, technical or professional positions. Women are listed on the Roster without charge. If you want more information, either for a position for yourself or for a woman to fill a position you have, you might wish to contact Catalyst. Write to Dee Fensterer, Vice President, Director of Employer Relations, Catalyst, 14 East 60th St., New York 10022.

COMMITTEE ON COMMITTEES OF THE AMS

Lipman Bers, President of the AMS, has appointed a Committee on Committees with the charge of considering the activity and function of Society committees, and the way the Society nominates, selects and appoints its officers and the members of its committees. For example, should nomination by petition be allowed for the office of (1) President, (2) member of the Board of Trustees? (Many of us in AWM think that the answers to (1) and (2) are yes.) You are invited to write to any member of the Committee with comments on the above topics. The Committee Chairman is P. Emery Thomas, Univ of California-Berkeley. Members of the Committee who also belong to AWM are Jonathan L. Alperin, University of Chicago; Chandler Davis, University of Toronto; Phyllis J. Cassidy, Smith College; Everett Pitcher, Lehigh University.

AMS-MAA JOINT COMMITTEE ON WOMEN IN MATHEMATICS

The above committee held its first meeting in Washington, D.C. on January 25. Discussion centered on issues and problems which the Committee felt it could and should consider: Obtaining a roster of women with bachelors and/or masters in mathematics, urging societies to invite more women to be speakers at their meetings, determining concerns of women who teach in two-year colleges--are they the same as other women in the four-year colleges or universities or are they special to the two-year college people, determining the information which other organizations

already have, etc. If you have any suggestions for the work of this committee, please write to any one of the members: Shirley Hill, Chairman, University of Missouri-Kansas City; Dorothy Bernstein, Goucher; Jane Cullum, IBM, Yorktown Heights, NY; Mary Gray, American University; I. N. Herstein, University of Chicago; Cathleen Morawetz, NYU; Charles Morrey, Jr., University of California, Berkeley; Jacqueline C. Moss, Paducah Community College; Jane Cronin Scanlon, Rutgers University; Gail S. Young, University of Rochester; Alice T. Schafer, Wellesley College.

THEY'VE DONE IT AGAIN DEPARTMENT

In the Death notices of the January AMS NOTICES (p. 74) the only person whose age is not mentioned is Cecilia K. Dunaj. She happens to be the only woman listed!

ANNOUNCEMENTS: FUTURE MEETINGS OF AWM

BOSTON, March 19, 1975. Room 2-131, MIT, 8 p.m. Bhama Srinivasan, "Have a simple group for tea".

MOBILE, March 20, 21, 1975. Luncheon meeting on one of those two days. For information contact Lida Barrett, University of Tennessee, Knoxville.

NEW YORK, March 25, 1975. Park Lounge, Biltmore Hotel. Informal Sherry Hour, 4-5 p.m.

COMING IN THE APRIL NEWSLETTER

Report on the AMS Council meeting in Washington, D. C. by Mary Gray.

Copy of speech by Lenore Blum at Washington AWM meeting.

FORM FOR NOMINATIONS OF OFFICERS OF AWM

For President, 1975-77:

For Representative from the South, 1975-79:

For Treasurer/Editor of Newsletter, 1975-77:

Please submit your nominations, self or otherwise, for the above offices to Alice T. Schafer, Department of Mathematics, Wellesley College, Wellesley, MA 02181, by March 28, 1975.

An election ballot will appear in the April Newsletter. If a runoff election is necessary, a second ballot will appear in the May Newsletter.

ASSOCIATION FOR WOMEN IN MATHEMATICS
MEMBERSHIP APPLICATION

Name _____
Address _____

Institutional affiliation, if any _____

Position _____

Make checks payable to
and mail to

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Alice T. Schafer
Department of Mathematics
Wellesley College
Wellesley, MA 02181

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Retired or Student _____ \$1. -
~~(\$2.00)~~
Institutional _____ \$2. -
(\$10.00)

*Contributions welcome
and needed.*

\rightarrow \$1.50 to Oct. 1, 1975
\$5.00, Oct. 1, 1975 - Oct. 1, 1976

AWM
Department of Mathematics
Wellesley College
Wellesley, MA 02181

March 1975

April