

Association for Women in Mathematics

Volume 12, Number 4

NEWSLETTER

July-August 1982

PRESIDENT'S REPORT

Toronto. The Joint Mathematics Meetings will be held at Toronto this summer, and as usual we will have an AWM presence at the meetings. A panel on "Women mathematicians in Canada" will be held at 9:50 a.m. on Wednesday, August 25. The panelists so far are Alice Turner, Mary McLeish and Reine Fournier. Alice Turner got her Ph.D. from the University of Toronto in 1932, worked as a statistician in industry for several years and then was on the faculty of York University. She is a Fellow of the Royal Statistical Society. Mary McLeish is in the Department of Computer Science at the University of Alberta. Reine Fournier is a French Canadian who has taught at the University of Sherbrooke until recently, and I am sure she will provide an interesting perspective on the French Canadian experience. I am also very happy that the panel will be chaired by the distinguished mathematician Cathleen Morawetz of Courant Institute, NYU, who is originally from Toronto. The panel will be preceded by an AWM Breakfast and our Business Meeting at 7:45 a.m., on the same day. As usual, there will be an AWM table. I look forward to an interesting meeting and hope to see many of you there. I particularly hope that many of our Canadian colleagues will be in the audience and contribute to the discussion following the presentations of the panelists.

Other news. I have still not recovered from the euphoria of the Emmy Noether Symposium, about which I keep hearing enthusiastic comments all the time. An article by Amy Irenas, a student at Bryn Mawr College, giving her view of the Symposium appears in this Newsletter. As you know, Anna Pell Wheeler played a big role in inviting Noether to Bryn Mawr. The presentations given at our Anna Pell Wheeler Symposium in Ann Arbor, in August 1980, also appear in this Newsletter. As I said in my last report, my co-editor Judith Sally and I will start working on the Proceedings of the Noether Symposium, to be published by Springer-Verlag, very soon.

Our second annual Emmy Noether Lecture was given by Olga Taussky Todd in San Francisco in January 1981. She has written up this lecture, and it has recently appeared as an article entitled "The Many Aspects of the Pythagorean Triangles" in Linear Algebra and its Applications 43(1982), pp. 285-295.

I wish you all a good and enjoyable summer, and look forward to seeing you in Toronto.

Bhama Srinivasan
Math. Dept.
Univ. of Illinois at Chicago Circle
Chicago, IL 60680

REFLECTIONS ON THE EMMY NOETHER SYMPOSIUM

by Amy Irenas, Bryn Mawr College, '85

The math conference began on March 16th with the 793rd meeting of the American Mathematical Society. There were 130 lectures and over 300 participants. These participants came from across the world and spanned many generations, but all shared a love of mathematics. I was told by one mathematician that math had become so specialized that mathematicians in one field were incapable of understanding work in another. If this is indeed true, it didn't pose a problem. As early as the Tuesday night cocktail party, mathematicians from many different specialties and universities were chatting excitedly with old friends and new acquaintances.

Wednesday night was the beginning of the symposium sponsored by AWM honoring Emmy Noether, a famous woman algebraist who taught at Bryn Mawr for two years. There were nine lectures in all which were focussed on the work of Emmy Noether and its influence on current mathematics. Having only a semester and a half of algebra thus far, much of the mathematics escaped me, but the aura that surrounded the conference is one which I am not likely to forget. Thursday evening there was a panel discussion where Noether's nephew, three mathematicians who had been her students at Bryn Mawr, and a mathematician who had taught at Bryn Mawr while Noether was teaching discussed their memories of Noether.

As one mathematician candidly put it, "She was a great mathematician, and a lot of people here seem to think she was also a very nice person. I don't know which is more important." From the Thursday night panel discussion one could easily gather that Emmy Noether artfully blended these two qualities. She was not discouraged by the difficulty a woman in the early 1900's had in breaking into a man's field, but at the same time she was not a rebel. She seemed almost oblivious to her status as one of the foremost women mathematicians of this century. She related to her students as friends and colleagues and enjoyed taking walks and having them over for tea, the conversation tending, of course, to mathematics. Noether seemed a woman who thoroughly enjoyed her life and her work despite any hardships that she had to overcome.

By Friday evening the lectures were over, and only a few mathematicians remained. One of the Bryn Mawr students who helped Rhonda Hughes keep the conference running smoothly passed a man sitting on the steps outside Pembroke. When asked if anything was wrong he replied, "No, I was just thinking--letting everything sink in. It was such a sensitive, moving symposium. I'm so glad to have had the chance to learn about the life and work of such a remarkable woman." I am sure many others share his sentiments.

NEWS FROM AWM MEMBERS

from Anita E. Solow, Grinnell College:

An AWM lunch was held on Saturday, March 27, 1982 in conjunction with the Iowa section MAA meeting at Grinnell College. Seven people attended, which was better than expected.

As the organizer of the lunch, I'll report on my perceptions of the meeting.

1. There are very few women in math in Iowa. Most are at the state universities, with a tiny number at the small colleges. By my count, there was a total of 7 women at the MAA meeting out of about 60 people attending. It is worth noting that there were three women speakers out of 15.
2. There was a strong feeling at lunch that the AWM is more concerned with the problems facing female research mathematicians than with the women who are more teaching-oriented. Most felt that AWM is much closer to AMS than to MAA.

It is my opinion that AWM could use some publicity with MAA members, to educate them about the many projects of AWM that affect them.

from Pat Kenschaft, Montclair State College:

The New Jersey Chapter of AWM helped the corresponding chapters of the MAA and NCTM include two talks about Emmy Noether at their joint spring meeting at Georgian Court College on April 17, 1982. Mark Krusemeyer of Douglas College spoke on "Her Work." Her nephew, Gottfried Noether of the University of Connecticut, had been scheduled to speak on "Her Life," but was unable to do so because of illness. Therefore Pat Kenschaft gave the talk about "Her Life."

The joint meeting was followed by a brief reception by AWM.

from Bettye Anne Case, Tallahassee Community College:

At the March meeting of the Florida Section, MAA, Alexandra Skidmore arranged the program for the AWM session, held as one of the parallel sessions on Friday afternoon of the meeting. Judith Provost, Rollins College, spoke on "Learning Styles and the Teaching of College Mathematics." At the business session following, Betsey Whitman, Florida A&M University, agreed to arrange a session for the following year's meeting. (Traditionally this group appoints a person to arrange the meeting one year later who is located somewhere near the site of that meeting, since the Executive Committee of Florida Section MAA extends the courtesy of inviting that person to its meeting at which planning is done.) Bettye Anne Case said that, circumstances permitting, she would be inviting AWM and AWM friends to a party at her home during that meeting, which will be held in Tallahassee. The hope was expressed by those present that one of the speakers from out of state would be an AWM member, and that person would be honored guest at the party. Since travel funds are getting very scarce, the possibility of local AWM members inviting out-of-town AWM members without travel funds to stay in their homes was considered a good idea, the problem being that there aren't usually many local members.

from Mary W. Gray, AWM CBMS Representative, American University, Washington, DC:

CBMS has reorganized, no longer being able to budget as much professional staff. (Marcia Sward, Associate Executive Director of MAA is now funded for a small amount of her time by CBMS.) Nevertheless, Al Rosen at NSF says the Summer Regional NSF-CBMS Conferences will continue, under guidelines similar to previous years'. There has been no official announcement yet; one will appear in a fall issue of the AMS Notices.

U.S.-CHINA PROGRAM OF THE NSF

Five fields have been added to the list of fields of cooperation under the U.S.-China Cooperative Science Program: Plant Sciences, Earth Sciences, Engineering Sciences, Information Sciences, and International Studies. Cooperation will continue in the six original fields: Archeology, Astronomy, Linguistics, Chemistry of Natural Products, Materials Science, and Systems Analysis. Proposals may be submitted at any time for cooperative research projects and a limited number of joint seminars. Write U.S.-China Program, Division of International Programs, NSF, Washington, DC 20550.

CONGRATULATIONS

Congratulations to the following recipients of NSF Mathematical Sciences Postdoctoral Research Fellowships: Patricia Bauman, University of Minnesota, for Courant Institute, NYU; Devra Garfinkle, Massachusetts Institute of Technology; and Judith A. Packer, Harvard University, for University of California, Berkeley. The stipend of \$26,000 was awarded on the basis of ability of the applicant and likely improvement of her scientific future.

ANNA JOHNSON PELL WHEELER (1883-1966): COLLOQUIUM LECTURER, 1927

Proceedings of the Symposium held on August 20, 1980, at Ann Arbor, MI.
Edited by the Moderator, Bettye Anne Case, Tallahassee Community College.

[Editor's note: Generous help from the participants and contributors listed is gratefully acknowledged and was an early indicator of the special feeling the Symposium was to have. Information and encouragement from John Oxtoby and Alice Schafer was instrumental in our being able to locate so many who knew Professor Wheeler. It was not possible to contact all who knew her, however; if others have comments to add, we hope they will send them to the Editor of this Newsletter for subsequent publication.]

Talks: Louise S. Grinstein, Paul J. Campbell, Nancy J. Owens, Ruth Stouffer McKee

Participant Reminiscences: Dorothy Browne Shaffer, Christine Williams Ayoub,
Lida Kittrell Barrett, Olga Tausky-Todd

Written Reminiscences: Gustav Hedlund, Vera Ames Widder, D.V. Widder,
Dorothy Maraham Stone

The moderator opened the Symposium on behalf of the Association for Women in Mathematics by noting that the first woman to be A.M.S. Colloquium Lecturer since Anna Johnson Pell Wheeler in 1927 was the current lecturer, Julia Robinson; those attending were invited to a party the next evening at which Professor Robinson would be the honored guest.



Wheeler

Figure 1

Louise S. Grinstein, Paul J. Campbell

At their request the text of the talks by Grinstein and Campbell is not reproduced here because of its overlap with their published accounts of the life and work of Professor Wheeler. Paper [3] below includes their Symposium talks as well as some other material presented at this Symposium. Special attention is called to the research description ([3], pp. 43-47) and the chart showing Professor Wheeler's work and the theses of her students.

1. (Grinstein and Campbell), Anna Johnson Pell Wheeler, 1883-1966, parts 1 and 2, this Newsletter, v. 8, September 1978 pp. 14-16 and November 1978 pp. 8-12.
2. (Grinstein), Anna Johnson Pell Wheeler, Notable American Women, The Modern Period, A Biographical Dictionary, Sicherman et al., ed., The Belknap Press of Harvard University Press, 1980, pp. 725-6.
3. (Grinstein and Campbell), Anna Johnson Pell Wheeler: Her life and work, Historia Mathematica 9 (1982), pp. 37-53.

The biographical chronology of Professor Grinstein's talk, and Professor

Campbell's description of Professor Wheeler's research, help put in context the personal reminiscences of the following eleven contributors who knew her.

Nancy J. Owens

"As Bettye Anne told you, I am Anna Pell Wheeler's grandniece; my mother was her niece and my grandmother her sister. I have brought some slides of photographs from our family album so you could see what she looked like at different stages of her life. Before I begin I would like to thank the Association for Women in Mathematics and Bettye Anne Case in particular for organizing this program. It is a great honor for my aunt, and my family is very appreciative. My mother called me the night before I left home and said she would be thinking of us today and that she was very pleased that this symposium is being held."

(Nancy then showed pictures and made comments about them.)

"This photo has a date on the back of it - 1906 - it was taken in Göttingen [Fig. 1]. The second picture [Fig. 2] is one that Ruth McKee places later, probably during the time she was married to Wheeler.

The next one - none of them have dates except the Göttingen one - Ruth places earlier primarily because she is wearing a hat [Fig. 3]. She was probably in college in Vermilion, South Dakota, along with her sister Esther. Her father lived in Akron, Iowa, which is near the South Dakota border. There is some correspondence between him and the girls at college. He would write things like: 'Well, I think you need some hats. I have chosen twelve of them. I will bring them up and you can select what you like.' Perhaps Ruth McKee will tell you the Emmy Noether 'hat story' and you will understand why the presence of the hat dates this picture.

"This is a picture of Anna later on, probably after her retirement [Fig. 4]. It is much more informal and more like I remember her. I was only three years old when she retired from teaching [1948]. By the time I knew her well she was eighty years old. That was during the 1960's when I was an undergraduate at Bryn Mawr College.

"The fifth slide [Fig. 6] is of a letter that is part of a collection written upon her retirement when a number of her colleagues and students wrote letters of congratulation to her. This one is from Annita Tuller Levine. It is one my mother particularly likes because it expresses the kind of influence my aunt had on others. I'll read it to you:

'Dear Mrs. Wheeler, At a time like this one can't help reminiscing. Isolated (pronounced with a short *i* a la Miss Lehr [Marguerite Lehr, a colleague of Professor Wheeler at Bryn Mawr]) items come to mind. I remember the foot marks on the wall of the math seminar room. You had the habit of standing on one foot while leaning the sole of the other against the wall. I remember being hauled off a tennis court to be told that Modern Algebra was good for my soul. I remember your stopping the car at an intersection in the middle of nowhere while you tried to identify a bird call which only you had heard. I remember the very "practical" application of some theory in mathematical physics to a vibrating string with a finite number of discontinuities. But most of all I remember my father's words after he met you on Commencement Day in 1930. The thought



Figure 2

of his daughter aspiring to be a female mathematician was a bit horrifying to him. However, after he met you, he said, "Such a woman I would like you to be." That, of course, was impossible. However, I hope I will be able to pass on to my students a bit of the feeling for mathematics which you have given yours. I hope you enjoy the many years of leisure before you."

[Fig. 5 is a portrait taken later in Professor Wheeler's life.]

"The first time I saw my aunt I was a young girl. We lived in Seattle. She lived out on the East Coast. In fact she was the only one of the family, which all started in the midwest, who went east. Everybody else went west, including my father's side of the family. Being so far away we didn't see her very often. When she came to visit I must have been between 7 and 10 years old and I was totally awed by her. She seemed incredibly exotic. She wore sun glasses, used a cane and smoked cigarettes with a fancy cigarette holder. She was the first academic intellectual I met and there was a specialness about her. We had tea every day at four when she was there. That was a new 'ceremony' to me, and added to the exoticness of her visit. Later when I went to college at Bryn Mawr my mother warned me that if I were ever with her to stop whatever we were doing by four and have tea! Another very special thing happened on that visit; there were 4 of us children and we were allowed to take turns sleeping in the same room with my aunt at night. When it was my turn she taught me about prime numbers. It was lots of fun. She took enormous delight in the fact that I could comprehend what she was talking about. It made me feel very good because of the delight she expressed.

"When I was in the 8th grade my mother had the opportunity to go back east and she took my older sister and me back with her to look at Eastern women's colleges. When we were at Bryn Mawr we stayed with my aunt. Ruth McKee's daughter, Clara, who was at Bryn Mawr at the time, took us around and showed us things and took us to a math class which was being taught by John Oxtoby. After the class my aunt asked us about it and I described to her what he was talking about and again she took such incredible delight that I was able to follow the discussion. I remember it was some kind of matrix that had to do with those k and j 's and I can't say that I was able to understand it, but I could follow it and I did enjoy it.

"When my father stopped working in mid career to go back to get a Master's degree (he was a mechanical engineer) and had to take up mathematics again, Aunt Anna gave him the same feeling of encouragement and interest in mathematics. She let him know she was very proud of him in his willingness to start over. I give these examples because I think they illustrate the kind of joy that she had in math and the infectious appreciation of math that she was able to pass on to her students and others, and that shows in the kinds of letters she received.

"One other thing I would like to mention has to do with my aunt being a woman and a woman mathematician. It is interesting that her mother, Amelia, had always been sorry that she herself hadn't gotten an education, and she was determined that her daughters would get an education. There were two girls and one boy in the family. The two



Figure 3

daughters were sent to college and Elmer wasn't. Amelia thought Elmer just wasn't college material. My mother says that Elmer probably was underrated, but that in any case the two girls overshadowed him and they went to college while he did not. (Remember that this was at the turn of the century.) My grandmother's stories of their school years, from elementary on, center around the two girls. Esther (my grandmother) recognized Anna's gift in mathematics, and often felt she (Esther) must be stupid if she couldn't keep up with the brains of her sister. It is unfortunate that Esther developed this picture of herself as inferior because she was very good in her own area of interest, which was history.

"I would like to say that it has been important to me that my Aunt Anna and my grandmother were such strong independent women, and my mother also. I have this feeling, myself, of having come from a long line of independent women, which has been important to me, and I am thankful for this kind of background.

"My aunt was a wonderful story teller. I wish she could be here to tell you some. I am sure you would find them very amusing. (Ruth McKee remembers a good many of the stories.) Unfortunately, no one in my family has taken on her ability as a story teller. One of the stories she told that I'll try to tell correctly, although I'm not sure I have it just right, is about Emmy Noether. When Emmy was in Germany there was some mathematical function going on. My recollection is that it was a lecture by a well-known mathematician. The men faculty were talking about it and trying to decide if Emmy could attend the lecture because she was a woman. They didn't think she should attend. A great many of them were saying she shouldn't be allowed to attend at all, and finally one of the colleagues spoke up and said: 'Gentlemen, this is an academic society, not a bathing club.' So a compromise was reached and Emmy Noether was allowed to listen, but behind a screen.

"Thank you very much."

Ruth Stouffer McKee

"I would like to share with you some of my memories of Mrs. Wheeler as a teacher. First of all her general advice to read critically has been most useful to me in my career as an analyst for the Pennsylvania State Legislature. Daily I applied her admonitions such as: Don't accept a statement just because it is printed; Be especially critical of any statement following the word 'obviously'; Don't believe anything unless you have thought it through for yourself.

"As a department head Mrs. Wheeler refused to be limited by the smallness of her department, or of her budget. Her standards were those which she would expect were there no such limits imposed upon her. She saw to it that her faculty members had opportunities to teach graduate students as well as undergraduates. In addition, the course load was limited so that each faculty member had time to work on research and had up-to-date reference books available. All these goals cost money and, as to be expected in a girls' college, the percentage of students majoring in mathematics was small and could hardly justify the kind of money Mrs. Wheeler wanted for her department.



Figure 4

"She did her best in obtaining money, then managed judiciously. She chose promising young instructors for her department. She considered the quality of their research and their relationship with colleagues. Her regular attendance at mathematical meetings provided her with a chance to discuss the prospects' work with colleagues and to listen to their papers. Once hired, it was only a matter of a few years until they were enticed to large universities by salaries with which Mrs. Wheeler could not compete, and off she was again in search of other promising scholars.

"Although these teachers whom she hired were excellent, she wanted to expand the experience of her students beyond the material which could be covered by a faculty of three or four. This she accomplished by sharing faculty with neighboring institutions... Sometimes a member of the University of Pennsylvania faculty brought his students to Bryn Mawr to give lectures there; other times a member of our faculty would drive us to the Penn campus and give a course to a combined group of Penn and Bryn Mawr students...

"In addition to exposure to a wide variety of courses, Mrs. Wheeler wanted us to have the stimulation of learning about research in progress. She wanted to stretch our minds beyond the course material. She formed a mathematical club, The Journal Club. We met once a month and invited scholars from neighboring institutions to join us. The explicit duty of the graduate students was to serve tea, but the result was real mental stimulation for them. Faculty members, advanced graduate students, or scholars from other institutions presented papers on the progress of their work, what they had succeeded in solving and what they were currently struggling with. We were delighted to recognize techniques which we understood as we saw them applied to an unfamiliar problem. Probably the most memorable talk at our Journal Club was that of John von Neumann on Game Theory.



Figure 5

"Another accomplishment of Mrs. Wheeler's was the extensive library which she succeeded in building with her small budget. Not only were basic texts and books covering new fields in mathematics available but also the important journals. It should be noted that it was a multi-language library. We were encouraged to tackle any language necessary. Our trips to Princeton were further mind-stretching experiences. At the time I studied at Bryn Mawr, during the early thirties, the Institute for Advanced Study at Princeton was the spot to be. For example, we heard Hermann Weyl, John von Neumann, and Albert Einstein speak. Sometimes we were told early about the opportunity and the time and place to meet. Other times it was almost on the spur of the moment. 'Come along,' Mrs. Wheeler would say, and off we rushed for her car.

"All this Mrs. Wheeler did for us to develop our mathematical abilities. But there was another side to her concern for us. She recognized that we needed help in our emotional and philosophical growth. She encouraged us to come for tea, to just drop in. She was a good listener. I don't know how she did it, but before you knew it you had told her all sorts of things which you had never intended to tell her. This was my experience but I have since learned that this was true with many of her students. I am sure that she was a helpful listener for

Emmy Noether. Mrs. Wheeler was the kind of person who recognized the needs of others and made herself available. She had a good cook, Mary, who made very good lemon sponge pie. When a pie that she had made for a big dinner party seemed to be a little too dark she would bake a second one and tell Mrs. Wheeler that she thought the girls could eat the dark one. The next day we would get an invitation for tea and pie. Much later Mrs. Wheeler, chuckling, told me that she thought that Mary made a pie a little dark on purpose. It seemed that we were always welcome. It was only years later that I truly appreciated the many hours of her precious time she generously gave us.

"A description of Mrs. Wheeler as teacher would be incomplete without mentioning her appreciation of nature and how she shared it with us. Her love of nature opened new doors. She took us on walks in the woods and taught us to listen for the titmouse and to look for the speckled leaf of the dog-toothed violet. A new pleasure for me was to build a small fire in the woods for tea and toast. We learned from her how to leave the site tidy and to drown the fire with lots of water.

"Perhaps I have painted too serious a picture of my friend and teacher. In fact she did a lot of laughing. There were two very special stories she loved to tell. The one was about the time the students had asked her to hide a monkey in her apartment for a week. At the end of the week the monkey was to be produced for the Freshman Show. The hour of the Show arrived and the monkey would not leave Mrs. Wheeler; she had to go with him to the Show. The other story had to do with Emmy Noether's hat. Emmy Noether had been told in Germany that the people at Bryn Mawr were very sophisticated and everyone wore hats. Dutifully wearing a newly purchased hat, Miss Noether arrived in Philadelphia; she took one look at Mrs. Wheeler wearing a comfortable suit, practical oxfords, but no hat. Thereupon Miss Noether took off her hat, tossed it in the back of Mrs. Wheeler's car and never wore it again.

"In summary, I would like to say that Mrs. Wheeler stretched our minds mathematically, taught us to think critically, to enjoy nature and selflessly gave of her time."

The moderator then read excerpts from the written contributions which follow that were sent on the occasion of the Symposium.

Gustav A. Hedlund

It is fitting that a symposium about Anna Pell Wheeler be held and as one of her many admirers, I would like to express my appreciation to the Association for Women in Mathematics for bringing it about. She was an extraordinary person--talented in and dedicated to her beloved world of Mathematics--but with wide interests, by no means confined to that world. She had the highest ideals and principles and possessed the strength of character to fight for them when need be. Her affection and generosity for those whom she respected were unbounded.

It was a privilege to be her colleague during my fledgling years and I owe her a great debt of gratitude for making those years at Bryn Mawr the happiest and most

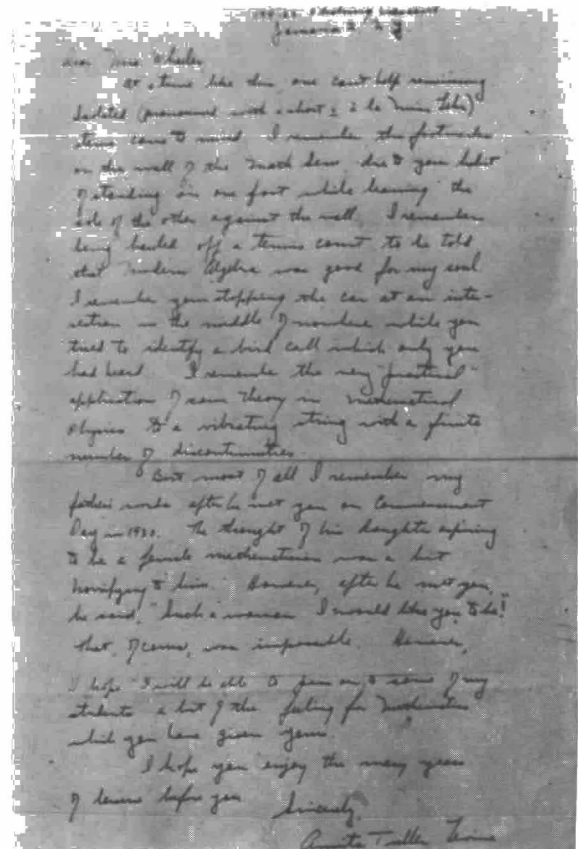


Figure 6

productive of my life. I hope that I have been able to pay off at least part of that debt by passing the wisdom gained from her on to the next generation.

Vera Ames Widder

My personal note is about the Anne Wheeler I became acquainted with at Q.E.D., her Adirondack home. In the summer of 1933, Anne wanted very much to rewrite her Colloquium Lectures in book form, but she found herself unable to do so. The year following Mr. Wheeler's death had been very strenuous, including moving from Princeton to Bryn Mawr and becoming, once again, head of the Mathematics Department there. Mr. Wheeler's daughter and seven year old grandson, Tony, from England, were with us at Q.E.D. most of that summer. I still remember Tony's constant questions and my efforts to keep him far enough ahead of Anne on the mountain trails so that she could listen for the bird songs and feel the silence of the woods that she enjoyed so much.

Though Anne successfully combined career and marriage, it was not an easy road. During most of the long years of Mr. Pell's illness, she carried a heavy teaching program and the economic problems of living on a woman's salary. During her happy years in Princeton, as a professor's wife, I suspect she was influenced by a fairly prevalent attitude: "One career in a home is enough" - words used by George David Birkhoff to me in 1939, soon after Dave and I were married.

Anne was such an important part of my life it is difficult to express the love and admiration I feel for her. She influenced me very strongly in my attitude toward teaching and encouraging students. I have enjoyed passing on the reply that she gave to my question, "How can I ever repay you for the many ways in which you have helped me?" Her reply was, "The best way to repay me is just to pass it on to other struggling students." I feel that some of Anne's enthusiasm for research has been passed along to her namesake, our daughter, Edith Anne, who is now working in neurobiology at U.C.S.B.

I am delighted that this symposium has been planned to honor Anna Pell Wheeler, my favorite teacher and a very special person. Whether my reminiscences are read or not, I have enjoyed having this occasion to think about Anne in this special way and to put my thoughts on paper.

D. V. Widder

Anna Pell Wheeler had many fine characteristics. But the one which made her unique was her total and complete devotion to mathematics and mathematical research. This greatly manifested itself in many ways. She devoted her own spare time to the advance of her specialty: the theory of integral equations and of infinitely many variables. Some notion of the importance of her contribution may be judged by the fact that she delivered, by invitation, the Colloquium Lectures of the American Mathematical Society in 1927. This is a series given by eminent members of the Society on recent advances in and around their own research. Indeed, Mrs. Wheeler was the only woman ever to be so honored [at the time this reminiscence was written].

Other tangible consequences of Mrs. Wheeler's loyalty to her subject were produced through the influence she exerted on the long sequence of graduate students whom she taught at Bryn Mawr. These disciples very quickly became aware of her ideals and tended to imitate them. She directed Ph.D. theses at a time when few women in the country were advancing to that level in mathematics. Quite naturally she had feminist proclivities and glorified in the success of her charges.

Mrs. Wheeler's influence was not limited to the inspiration she exerted on her students. Her colleagues came equally under her spell. As chairman of her department, she had constantly to choose young assistants and instructors for positions which often turned out to be short-term. These young scholars were given light teaching loads and all possible encouragement to continue their own research. This was at a time when many another college only reluctantly accepted research as a part of a teacher's activities. I am sure that this succession of her colleagues would attest to the lasting effect on their own attitudes, produced by contacts with her.

The friends of this great teacher will like also to recall her love of nature. She spent her summers at St. Hubert's in the heart of the Adirondacks. She and Mr.

Wheeler owned a lovely cottage there, named Q E D, nestled among the highest peaks. To this haven she would invite her friends and, in earlier years, go on climbs and picnics with them. In later years, she made a collection of wild flowers, planting them in the bed of a tiny mountain stream beside her cottage. Here she delighted to add some new variety. She resisted any effort at "civilization", always trying to maintain the natural and primitive aspects of the place. Each year she would have the constant companionship of her latest trainee, a chipmunk that became very bold and companionable by summer's end. It is good to know that in her declining years she was still able to spend her summers in this ideal retreat which she loved so much.

If I may add a personal note, let me remark that I was one of the young instructors referred to above. It is certainly due to the opportunity and encouragement that Mrs. Wheeler gave me to do research that I was able to join the faculty of my alma mater. For this and for introducing my wife to me, I am eternally grateful to her.

Dorothy Maraham Stone

Thank you for your letter and suggestion that I talk about Anna Pell Wheeler and her work. I am delighted that she is getting recognition; she was a very wonderful person and a fine mathematician, and I developed a deep appreciation and profound respect for her. Unfortunately, though, I cannot accept your kind suggestion that I talk about her; in the first place, I may not be able to attend the summer meeting, and in the second, although she was my thesis supervisor, I actually worked in a field quite different from her own. All I could contribute would be a few small stories on the personal level. Still, I shall really try to be at the meeting and...if, for instance, there is an informal session on small stories and anecdotes, I might recall something to contribute.

The moderator then invited those present who knew Professor Wheeler to contribute reminiscences. [The following were reconstructed from the very poor quality tape that resulted from passing the microphone around, and correspondence.]

Dorothy Browne Shaffer

"I am very pleased about this Symposium. I had the privilege only of being an undergraduate at Bryn Mawr; certainly it couldn't have been a more wonderful education. It was especially valuable later when I was a graduate student. I still cherish the experiences that I had, the courses that I took, ... and knowing Anna Pell Wheeler ... I see that I'm not the only one of us that's here..."

Christine Williams Ayoub

I was amused when Bettye Anne wrote that she could not hear ANYTHING of what I said on her tape. This is because Mrs. Wheeler had expressed concern about my teaching on account of my speaking so softly.

My introduction to Analysis was in a class taught by Mrs. Wheeler in my senior year at Bryn Mawr. She had been quite ill and often sat at the table part of the class period and talked about the subject rather than giving a formal lecture. The class was a revelation to me. It was the first time I had seen an ϵ or δ and I fell in love with them! I suddenly understood expressions like "becomes and remains arbitrarily close to" -- expressions which had always seemed very vague. As many students have a battle with the little creatures before making their peace with them, I believe that Mrs. Wheeler had the rare ability of giving a feeling for the subject. In any case, the year of Analysis I took with her was a real joy; I have kept my notes and problems from the course for all these years.

Mrs. Wheeler encouraged me to go to graduate school and kept in touch during my years there. When I was awarded the Alice Freeman Palmer scholarship (a scholarship she herself had held) she wrote to me saying that I should go into Analysis as so few women did. She, no doubt, remembered my enthusiasm in her class, but by that time I had found a new love so that I disappointed her and became an algebraist.

Josephine M. Mitchell

"I got my Ph.D. at Bryn Mawr in 1942. Mrs. Wheeler gave me the problem to work on and then I worked until I completed the doctorate. In the courses I took from Mrs. Wheeler...when you finished you knew what mathematics was about."

[Professor Mitchell's doctoral director was Professor Hilda Geringer.]

Olga Taussky-Todd

[Professor Taussky-Todd was present at the Symposium and contributed a copy of the letter Professor Wheeler sent to her when she moved to the West. See Fig. 7.]

819 MONTGOMERY AVENUE
BRYN MAWR, PENNSYLVANIA

May 21, 1957

Dear Olga & Jack-

I received your news with mixed feelings. I realize that you must have had a very good offer (later Mr. Rademacher gave me more details) and for that I was delighted. But many of us in the East will miss you very much. Although I did not see you often it was a comfort to know you were near and that there was the possibility of seeing you at meetings. I hope you will come ^{East} frequently. Also I hope that I shall be able to go to Berkeley to see my sister and at a time when there is a meeting in the West not too far away.

With all best wishes for pleasant surroundings in your new home

Anna Bell Wheeler

Figure 7

Lida Kittrell Barrett

"I was not a student at Bryn Mawr. In the fall of 1951 I enrolled as a part-time graduate student at the University of Pennsylvania. My husband had just completed his doctorate at the University of Texas and was a young faculty member at the University of Delaware; so I was going part-time. I attended the first Colloquium Lecture at Penn. This woman came and simply stood before me. She didn't introduce herself. I didn't have

any idea who she was. She was just all of a sudden right there and said 'And who are you?' I identified myself as Lida Barrett; she said 'No, who are you?' I vividly remember this confrontation. So I explained that I was a graduate student. She went on to pursue by a series of questions, what I was taking, where I was from, what was my background? She charged across the room and met my husband who was there for the talk and encouraged him to see that I stayed in graduate school. This began a friendship which went on for the three years that I was at Pennsylvania. This was 1951. Wheeler had been dead for a long time. She still had very close ties at Princeton. We had two very good friends who were at the Institute for Advanced Study during that particular period and so on Sunday mornings we would drive to Bryn Mawr, pick Mrs. Wheeler up at her apartment--there was a slight detour coming up from Delaware--not that far out of the way, though--and we would go across to Princeton, leave her with her friends in the Classics Department and go on and spend the day at the Institute. Much of that time she spent talking to my husband about integral differential equations and in general about people in mathematics. I very literally was a part-time student the first year. My intentions at that point when I started in--I guess I can put in a personal story--well, I had agreed when I married to stay in graduate school until I got pregnant. I have a Ph.D. from Penn and three adopted children. But it is very fair to say that Mrs. Wheeler was a large part of my staying in graduate school. I believe that she would have come to Newark, Delaware and collared me right into class if she thought I was dropping out from graduate school.

"One more story: I got my doctorate at the end of 1954. During the academic year 1954-55 I was not employed as a mathematician. The University of Delaware had a nepotism rule; my husband was on the faculty there. I did go back and forth to Penn. In the spring of 1955 my husband accepted a position to work a year at Yale with Einar Hille. Mrs. Wheeler was very aware of this. I received a letter from Wellesley asking if I would be interested in a position and saying that I had been highly recommended and would I consider coming for an interview. I thought that was a strange letter. Everybody at Penn knew I was at Delaware with my husband and I wasn't as liberated in those days as some people are now. The next week Mrs. Wheeler asked me, 'Have you had any interesting letters lately?' I immediately knew why the letter from Wellesley had come. I accused her of it. She said, 'Why, of course, Wellesley didn't ask me if I knew of anyone who might be available; they asked me who would be good to teach at Wellesley, particularly a woman; and although I knew you could not go there I simply answered their letter.' I greatly appreciated that. She went on to say that she didn't feel that she was being unfair to Wellesley, and that she felt I needed to get acquainted with the Wellesley faculty! She really made an effort to see that women with Ph.D.'s in mathematics got a chance to know each other. I never heard her use terms which are prevalent today such as a network of women mathematicians, but she, herself, realized its importance. She felt a direct obligation, even for people like me who had no part of their education at Bryn Mawr. She was simply concerned about people and was a delight to know. I could go on with stories...

"It is really hard for me in looking back to realize when I met her she had been retired for two years or that she was actually retired at all, because she remained so involved in the colloquium--there was an area-wide colloquium--and in the activities of Bryn Mawr and the lives of a great many people."

WOMEN IN THE PROFESSIONS

The Honor Society of Phi Kappa Phi has published a special issue of its journal entitled "Women in the Professions." This issue contains articles on "Comparable Worth," "Math Anxiety," "Blue-Collar Jobs for Women," "The Nursing Profession," "Double-Career Marriages," and many other topics. Single copy: send \$2.75 to Subscription Dept., National Forum, Box 19420A, East Tennessee State University, Johnson City, TN 37614.

ERA ACTIVITIES CONCLUDE

by Bettye Anne Case, Tallahassee Community College, AWM ERA Coordinator
since 1978

The fate of the current Equal Rights Amendment is known on your today. As I write this, it is not known on my today.

Whatever its fate, the efforts of AWM and AMS not to hold meetings in unratified states will necessarily have ceased. (The one exception to this is that we have been asked to try to have a meeting in any state which ratifies if, for example, one or two do but not three. Should that situation arise, I would ask both the Executive Committee and the Membership Meeting in Toronto to consider the matter.)

I appreciate the encouragement and cooperativeness of our membership concerning AWM's official efforts regarding the ERA, and especially of those of you who had some reservations about those efforts.

The only woman ever to be a member of the Securities and Exchange Commission has a portrait of Susan B. Anthony on her wall and answers, when asked why, something to the effect that: If she hadn't done what she did, I wouldn't be here.

Although I would never encourage any young woman without tenure to spend any time which would otherwise be used for research on such activity, there is a point in our lives at which many of us feel we must recognize this debt that we owe (and especially owe to the women and men mathematicians who have given us chances not there 75 years ago).

Let us respect the conscience of each individual to do what they have to to insure the opportunities wishes for our grandchildren. We coined a slogan when dealing with the legislature in Florida in 1977. Whatever today's status, "ERA WON'T GO AWAY."

SOME RECENT LEGAL DEVELOPMENTS CONCERNING SEX DISCRIMINATION IN ACADEME

by Mary W. Gray, General Counsel, AWM

After years of discouraging decisions, the courts have recently become somewhat less sympathetic to universities' claims that institutional autonomy insulates their personnel practices from judicial review. The following discussion is not inclusive, but highlights some recent developments which may be of interest.

Kunda v. Muhlenberg College. The Third Circuit upheld the District Court's award of tenure conditional upon completion by Kunda of a master's degree in physical education. Kunda, unlike her male colleagues, had not been informed that the receipt of the degree was necessary for tenure; the president and dean of the college had overruled faculty recommendations for tenure so the decision was also an affirmation of the primacy of the faculty role in such judgments. The award of tenure, even conditionally, had not previously been granted as a Title VII remedy.

Penk v. Oregon State Board of Higher Education. Plaintiffs have obtained class certification for faculty women at all state institutions in Oregon. Earlier the same judge had found for the plaintiff in a Title VII case at one of the institutions under the Board's jurisdiction. Salary is the central issue; the amount of statistics to be generated and analyzed is enormous and will take a considerable amount of time.

Marshall v. Georgia Southwestern College. Judge Owens found violations of the Equal Pay Act at Georgia Southwestern through one-on-one comparisons of male and female faculty, but in his decision suggested that discrimination may pervade the pay structure of all the universities, state colleges and community colleges in the state of Georgia which are under the control of the same Board of Regents. In the two years since the original decision the EEOC (now in charge of EPA cases) and the Regents have been arguing over a proper means of identifying and remedying systemic pay discrimination.

In re Dinnan. In this case the same Judge Owens sent Professor Dinnan to jail for 90 days for refusing to reveal how he voted in a tenure case. The 5th Circuit upheld the judge's ruling. The underlying case (Blauberger) has yet to be heard. In another confidentiality case the Ninth Circuit reversed the District Court's refusal to require that the plaintiff in Lynn v. Board of Regents of the University of California be shown her personnel file. The case is on remand and also involves tenure denial. In the third current confidentiality case, Gray v. LaGuardia Community College, this involving charges of race discrimination, plaintiff did not fare so well, being denied access to information on his negative tenure decision; he is currently appealing to the 2d Circuit.

Griffin v. Board of Regents of the Regency Universities. The plaintiff has been able to secure an injunction to keep her on the payroll while litigation proceeds. Such an injunction is very difficult to secure in Title VII cases since among other things irreparable damage (not capable of being remedied by money) must be shown. The Seventh Circuit has recently upheld the issuance of the injunction. A class certification has been obtained; the primary issue is Illinois State University's practice of placing women disproportionately in temporary rather than tenure track positions. Class certification can be crucial in Title VII cases, and is becoming harder to get. For example, in Faculty Women's Association v. Michigan State University, it was held that hiring, tenure, promotion and salary issues are decided at the departmental level so that the claims of all women at the University lack the commonality required for class actions.

Not all goes well, however. In Ricks v. Delaware State College, the Supreme Court severely limited the time available to file charges of discrimination with the EEOC (prerequisite to filing suit under Title VII). The court determined that the 180-day period begins when one first learns of nonrenewal or tenure denial, not after final university action, exhaustion of internal appeal procedures, or actual termination of employment.

TIAA Litigation. (EEOC v. Colby College, Peters v. Wayne State University, Spirt v. Long Island University, EEOC v. Lewis, American Nurses Association v. University of North Carolina, etc.). Four years ago in City of Los Angeles Water and Light v. Manhart, the Supreme Court declared that requiring female employees to contribute more to get the same pension benefits as their male colleagues violates Title VII. Under TIAA-CREF, which is the pension carrier for most private higher education faculty and many in the public sector, the same contributions are required from men and women, but benefits are less for women (under the single life option). In Peters v. Wayne State, Spirt v. Long Island University and EEOC v. Colby College, the courts held that Manhart teaches that the TIAA-CREF plan also violates Title VII. There are variations in the decisions--for example, the trial court in Peters held TIAA itself to be covered by Title VII whereas Spirt exempts TIAA on the grounds that it is in the business of insurance and thus protected from federal regulation by the McCarran-Ferguson Act. (CREF, paying variable annuities, was held not to be "in the business of insurance" since the investment risk is that of the policyholder, not that of CREF.) Practically this is not crucial since in any event an employer cannot use an insurer which uses sex-segregated tables. These two cases are on appeal; in fact, the Sixth Circuit will probably have handed down its decision by the time you read this. In Lewis the EEOC seeks to compel the New York Superintendent of Insurance to approve a unisex annuity plan it negotiated in a settlement with TIAA-CREF as to benefits derived from prospective contributions. The Superintendent first approved a plan and then reversed himself and then reversed himself again, but the third plan--which he approved--is held by the EEOC to be itself a violation of Title VII. Those of you who are TIAA-CREF participants may recall the carrier's announcement in the fall of 1979 that it was "going unisex". That pledge has been withdrawn by the company, and no resolution is in sight even for benefits from future contributions, much less for benefits from past contributions. If only prospective contributions were deemed to be subject to unisex payouts, it would be well into the 21st century before equality would be achieved.

There are a variety of other complex issues surrounding this litigation--issues of whether TIAA-CREF is acting as an agent of the employer, of what the extent of backpay

liability is and who pays (TIAA or the colleges and universities), of whether ERISA (Employees Retirement Income Security Act) covers TIAA-CREF, of what happens to those already drawing benefits, etc. Since it is conceivable that there will be a future cutoff date for unisex benefits (e.g., all those taking their annuities after January 1, 1984 will get all benefits computed on a unisex basis), women at or near retirement age may want to consider deferring the taking of their annuities as long as possible.

In Colby College, the college's life insurance plan, unlike group life insurance plans of many colleges and universities charged men the same amount for lesser benefits. TIAA has also promised to go unisex on all life insurance but has not yet done so. Men also are disadvantaged by choosing the joint-survivor option on annuities since the use of sex-segregated tables results in a greater reduction in their benefits if their wives are younger. This serves as an additional disincentive for men to provide for their survivors. Such a scheme was held to violate Title VII in the Probe case in California (teacher retirement system) and in Shaw v. International Association of Machinists. In another pension case, Norris v. Arizona, the Ninth Circuit upheld a District Court decision declaring a voluntary supplementary retirement plan which provided for a lump sum option at retirement to be a violation of Title VII. Other cases holding plans similar to TIAA-CREF's in violation of Title VII are two New York cases--Hannah v. Teachers' Retirement System and Women in City Government United v. City of New York--and Henderson v. Oregon (state retirement system). Robertson v. Reilly found a state teachers retirement scheme which used sex-segregated tables to violate the U.S. and Indiana state constitutional guarantees of equal protection.

If you are interested in details of any of these cases, you should be able to locate them in your local law library. If you have more general questions, feel free to call (202-686-2393).

LOUISE JOHNSON ROSENBAUM

by Burton W. Jones, University of Colorado, and Robert A. Rosenbaum, Wesleyan University
L. Rosenbaum was the first woman to receive a Ph.D. in mathematics at the University of Colorado.

Laura Louise Johnson was born on Jan. 21, 1908 in Carrollton, Illinois. When she was ten, she and her parents moved to Boulder, Colorado, and lived on a farm northeast of town. Boulder and the University of Colorado had undergone dramatic changes in the years before and were on the eve of equally important ones to come. The town had begun about 1860 with the discovery of gold and other minerals in the foothills and was first incorporated in 1871 with a population of less than a thousand. The University considered itself founded in 1876, but the only tangible evidence of this was a building (Old Main), completed in July of that year, and the fifty-two acres on which it was built. The following Spring the Regents elected two faculty members: President Joseph Sewall (Ph.D., Harvard) and Professor Justin E. Dow, formerly principal of Boulder's High School, at salaries of \$3000 and \$2000 respectively. The first students entered in the fall of 1877 and the first graduating class, consisting of six students, received their degrees in 1882.

By 1907 mining had begun to wane and the University had freed itself of its Preparatory Department by donating some of its meager funds to help support the public schools. Nevertheless, when Louise entered high school fourteen years later it was still known by the name of "Prep".

She had gone to a country school through grade 9; but, since Latin was not offered there, she took a light-housekeeping room in town--at age 13!--in order to complete her high-school education. The program at "Prep" was notably strong; for example, Latin was taught by Mrs. Fred B. R. Hellems, whose husband was for many years Dean of the College of Arts and Sciences of the University and who often gave lectures at "Prep". The couple were affectionately nicknamed "Mother Nature" and "Father Time".

After World War I, the University increased in size until when she entered in 1924 it contained about 2500 students. Charles A. Hutchinson was head of the Department of Applied Mathematics in the College of Engineering; and Ira M. DeLong, of the somewhat smaller department in the College of Arts and Sciences. The following year Aubrey J. Kempner (Ph.D., Göttingen under Landau in 1911) took DeLong's place, and the other members of the department were Professor George Light (Ph.D., Yale, 1916), Assistant Professor Claribel Kendall (Ph.D., Chicago, under Wilczynski, 1923), an instructor and probably some assistants. Louise, as a sophomore, was a member of Kempner's first class in Calculus in Boulder. The early years of the thirties brought the depression. A number of the men of the town took to the hills to make a bare living by working old mining claims, grubstaked by the local hardware store, but the days of the narrow gauge railroads were almost past.

Louise's financial resources for her undergraduate career consisted of a contribution of \$50 from her parents. Throughout her 4 years she worked as a checker in the University cafeteria; the canonical compensation was board for 3 hours of work per day and room for 1 hour. As a lover of the outdoors, she often skimmed on meals to have time for the weekend outings of the Hiking Club. She might have majored in geology if she could have afforded the laboratory and field trip fees. But, in those days, a female geologist was even rarer than a female mathematician!

Some of Louise's contemporaries at the University became well-known in the mathematical world. A. J. Lewis, head of the mathematics department at the University of Denver for many years, received his Ph.D. degree under Kempner in 1932. Jack R. Britton, another of Kempner's students (Ph.D., 1936) had a large part in the coming of age of the Applied Mathematics Department. In 1931, Edwin J. Purcell wrote a Master's thesis under Professor Kendall, went on to receive his Ph.D. degree at Cornell University and to teach for many years at the University of Arizona; he wrote a very successful textbook in Analytic Geometry and Calculus still in use. Earl D. Rainville received his B.A. degree in 1930 and went on to the University of Michigan. In 1934 a B.A. degree was granted to D.C. Spencer who had a distinguished career at Princeton and Stanford Universities, is now retired and living in Durango, Colorado.

Upon graduation from the University in 1928, with election to Phi Beta Kappa, Louise began teaching high school in eastern Colorado, where her teaching duties included physics, civics, and economics, as well as the complete curriculum in mathematics. After two years of high school teaching, she returned to Boulder and supported herself with various sub-faculty and part-time faculty teaching assignments at the University while doing graduate work in mathematics. As is still common for people with such status, she would not know until the last minute what her assignment would be, or, indeed, whether she would have a job at all. For administrative reasons, she was always described as a "part-timer", even during those (rare) quarters when she taught 17 or 18 hours per week, the full-time load being 16 hours. With scrupulous attention, Kempner saw to it that she received more than a full-time salary on such occasions. During one year of the early thirties, Louise commuted substantial distances to a CCC installation to teach mathematics.

She received her Master's degree in 1933 under Kempner with a thesis on transfinite numbers. It contains the basic ideas of set theory and the various kinds of "simply and well-ordered aggregates [sets]". The fundamental properties of ordinal numbers and Zermelo's axiom are discussed in detail and the list of twelve references ranges from Cantor to Whitehead.

There were two women who received their Ph.D. degrees under Kempner in 1939. One was Marjorie Louise Heckel Beaty, writing on "Complex Roots of Algebraic Equations", who went on to the University of South Dakota where she is now Emeritus Professor. Louise's thesis was on the Diophantine equation:

$$P_n = x(x+1) \dots (x+n-1) = y^k, \quad n \text{ and } k > 1.$$

After a rather extensive review with some proofs of solutions of special cases of this equation as described in Dickson's "History of the Theory of Numbers" and some papers not there listed, she proved four little theorems followed by two rather significant results:

1. If $n = 2k$, there are no solutions.
2. The equation has at most one solution if $n = 4, 5, 6$, or 7 and k is a prime greater than 5 .

For the former a rather involved argument is given using symmetric functions and based on work of Liouville, Sylvester, and Schur. The latter uses the following result of C.L. Siegel ["Die Gleichung $ax^n - by^n = c^n$ ", Math. Ann., 114 (1937), 57-68]:

$|ax^n - by^n| \leq c$, for a, b, c positive integers and $n \geq 3$,
has at most one solution x, y in relatively prime positive integers if

$$|ab|^{\frac{1}{2}n} - 1 \geq \lambda_n c^{2n-2}, \text{ where } \lambda_n = 4 \left[n \prod_{p|n} p^r \right]^n, r = 1/(p-1).$$

Her proof uses some ideas of S. Narumi ["An Extension of a Theorem of Liouville's", Tôhoku Math. Jour., 11(1917), 128-142]. Her thesis, except for the expository material was published in the American Mathematical Monthly 47(1940), 280-89. At the close of her paper a communication was mentioned of Paul Erdős, dated February 22, 1940, to the effect that he had proved but not published her first result above and that G. Szekeres (no reference given) had proved that the title equation has no solutions for $n < 9$.

Louise was very active assisting Professor Hutchinson in the University Recreation Department. In the summers and at other times of the year she arranged and guided tours of students into the mountains by bus or back-packing and climbed many of the high peaks of Colorado. She assisted in the entertainment of the members of the Mathematical Association of America and the American Mathematical Society and their families at their summer meeting in 1929, frightening Mrs. James Pierpont and Dunham Jackson, among others, by her nonchalant driving on narrow dirt mountain roads. Mrs. Hutchinson remembers that they found her very dependable and were thankful when on occasion, she offered to stay with their children when she and her husband were out of town. She also recalls that Louise was a very attractive red-headed girl who preferred the informal dress of the out-of-doors and got along very well with people.

After receiving her degree she was told by Kempner that there was really no future for her in Boulder since two of the four professorial members of the department were women. She went to Reed College on a General Education Board Fellowship to work with Professor F. L. Griffin on the preparation of an integrated mathematical curriculum for a small liberal-arts college, the other fellows in the program being Harry Goheen, Robert Rosenbaum, and Henry Scheffé. She and Rosenbaum remained at Reed as faculty members after the fellowship year, and they were married in 1942. While her husband served as a naval aviator in the Pacific, Louise continued to teach at Reed, carrying a particularly heavy load in a military pre-meteorology program. She and Professor Griffin were proud that the Reed unit stood first in the nation on the uniform exams administered to all students in the program.

Despite the duties of a growing family--three sons were born and reared--there was no semester during which Louise did not teach at least one course, but she often experienced the tension between the demands of her career and those of her home. Nevertheless, she functioned smoothly in both environments, directing some notable undergraduate theses, serving on major College committees, running a household with minimal help, and joining her husband and sons in skiing and hiking in Oregon, in Europe, and especially in her beloved Colorado.

In 1953 she gave up her position at Reed to go to Connecticut, where her husband was appointed to the Wesleyan University faculty. Louise held visiting appointments in the mathematics departments of Trinity, Connecticut, and Smith Colleges, and a professorship at St. Joseph College in West Hartford, Connecticut. She was active in mathematics education, serving on a School Mathematics Study Group committee, directing summer institutes for teachers in Connecticut and Oregon, collaborating with her husband on a "Bibliography of Mathematics for High School Libraries" (which went through five editions), and writing a highly successful booklet on "Mathematical Induction" for Houghton-Mifflin. For the eleven years during which her husband held various positions in Wesleyan's central administration, Louise was called upon to do very extensive entertaining of University visitors, as well as the informal entertaining of students and colleagues which she had begun at Reed with warm natural hospitality.

For much of the last ten years of her life she was afflicted with a progressive circulatory disorder. She endured the end of her hiking and the imposition of other restrictions with quiet stoicism, and she succumbed to the disease on January 16, 1980.

Although she curtailed her mathematical activity to devote time and energy to her family, she never complained of the jewels of theorems that she sacrificed. She was proud of the upbringing she provided her sons, and might well have echoed the Roman matron who introduced her children to a bedecked guest with the words, "Ecce, gemmae meae!"

SEX DIFFERENCES IN GEOMETRY ACHIEVEMENT

by Roberta L. Dees, Purdue University Calumet

Recent research has indicated that no significant sex differences exist in mathematics achievement through the first year algebra course. In a recent study of achievement in geometry, conducted at the University of Chicago, similar results were found.

The NIE-supported project, Cognitive Development and Achievement in Secondary School Geometry (CDASSG), Zalman Usiskin, principal investigator, tested 2700 students in 13 schools in 5 states. The primary purposes of the project were to assess achievement on standard geometry content and to test the developmental theory of the van Hiele's, two researchers from the Netherlands. These purposes were met by Usiskin and colleagues Roberta Dees and Sharon Senk.

As a peripheral study, Dees investigated the performances of boys and girls on the various measures. Two tests were given in the fall, the van Hiele test and a multiple choice test of standard vocabulary and concepts from geometry, designed to test how much knowledge of geometry the student had upon entering the course. On this Entering Geometry (EG) test, the boys' mean was about one item higher (on a 19-item test) than the girls' mean.

At the end of the year, the van Hiele test was administered again, along with a standardized 40-item test of geometry content. The boys' mean was then one item (out of 40) above that of the girls. However, an analysis of covariance showed that if scores were adjusted for knowledge of entering geometry, there were no significant differences in achievement on this measure.

In the spring, a test of students' proof-writing ability was also given in classes which studied proof and whose teachers agreed to participate. Analysis by Senk showed that there were no significant differences between boys' and girls' proof-writing ability, in spite of the fact that boys entered the course with slightly more knowledge of geometry.

Persons wishing the complete results on sex differences in this study may write the author at: Department of Mathematical Sciences, Purdue University Calumet, Hammond, Indiana 46323.

EDUCATION COMMISSION TO EXPLORE IMPROVEMENT IN SCIENCE, MATH ACHIEVEMENT

news release

Background information will appear in the next Newsletter.

Solutions to this country's critical need for high school graduates with solid backgrounds in science and mathematics will be explored by a new Commission on Pre-college Education in Mathematics, Science and Technology just established by the National

Science Board (NSB). The NSB is the policymaking body of the National Science Foundation.

The Commission of 18 highly respected individuals from a wide variety of fields was appointed by the NSB and will be co-chaired by William T. Coleman, Jr., former Secretary of Transportation and now a senior partner in the law firm of O'Melveny and Myers, and by Dr. Cecily Cannon Selby, formerly National Executive Director of the Girl Scouts, U.S.A., and chairperson of the Board of Advisors of the North Carolina School of Science and Mathematics.

The purpose of the Commission is to define a national agenda for improving mathematics and science education in this country. It will develop an action plan that will include a definition of the appropriate roles of federal, state and local governments, professional and scientific societies, and the private sector in addressing this problem of national dimension. Expected outcomes are the identification of the steps to be taken, the assignment of responsibility for action, and a time table for their accomplishment.

"The quality and accessibility of education for our young people puts a limit on everything we can accomplish as a Nation," said Dr. Lewis M. Branscomb, Chairman of the NSB and Vice President and Chief Scientist of IBM, Inc. "Already many citizens on their own initiative are working to improve their schools; many mathematicians, scientists and engineers, worried about the quality of secondary education in their disciplines, are looking for ways to strengthen it. The Commission will seek to encourage professional societies and other organizations already at work on this problem. We expect the work of the Commission to lead to clear action plans for improving the quality of secondary school science and mathematics."

Dr. John B. Slaughter, Director of the National Science Foundation, said, "The decline in student achievement in mathematics and physical sciences at the precollege level has reached a point where this country's strength in science and technology may be affected.

"Education is a function assigned to state and local governments, but the quality of that education as it affects American industrial productivity, employment opportunity and social progress is a national concern. We must find ways to reverse the decline in precollege education in science and mathematics. Establishing the Commission now is an important step toward this goal. I view it as the most important matter I will face during my tenure as Director of NSF."

Mr. Coleman said, "I view the purposes of the Commission as highly important to the economic and social development and to the future security of this country. We need to focus our attention and that of the public on the sagging quality of science and mathematics education, what that means, and then determine what might be done to reverse that trend."

"The potential for successful and rewarding work in science and mathematics can be found in countless able and eager students in every community across the Nation," Dr. Selby said. "The resources for the critically-needed improvement in our education system exist in our educational, scientific, technological, industrial, and military communities. Top priority must be given to reallocation of these resources to better serve our needs and aspirations on one hand and our scientific and technological communities on the other hand."

The Commission will be active over a period of 18 months and is expected to issue interim reports on its findings at six-month intervals. In the course of its meetings it will:

- * Examine existing evidence on the quality of general and pre-professional secondary school education in mathematics and science;
- * Develop an understanding of the roles that government and private organizations, professional groups and individuals can play in improving mathematics and science education;
- * Identify where current policies fail to ensure the entry, selection, education and exploitation of the full range of potential talent in science, mathematics and engineering;

- * Specify existing mathematics and science programs, teaching materials and teaching techniques whose success justifies imitation;
- * Establish a set of principles, options and strategies which can be used to improve the quality of secondary school science and mathematics education.

Commenting on the Commission, Dr. George A. Keyworth, Director, Office of Science and Technology Policy and Science Adviser to the President said, "The Commission will be addressing a problem of national magnitude. I believe the Commission will be capable of developing visionary initiatives. It will identify ways for all of the concerned communities to work together in addressing the problems of math and science education in our secondary schools."

OF POSSIBLE INTEREST

On Campus with Women is no longer free. A one-year individual subscription is now \$15. Persons contributing to the Project on the Status and Education of Women will automatically receive a one-year subscription for contributions over \$30; those contributing \$50 or more will receive a two-year subscription. I find this publication to be extremely interesting (you may recall excerpts which I reprint from time to time). Write: Project on the Status and Education of Women, Association of American Colleges, 1818 R Street, NW, Washington, DC 20009. Checks should be made payable to AAC/PSEW.

Would you be interested in a free audio-visual package to use in your career guidance program for women in the science field? Under a grant from the National Science Foundation, a group of professional women at the Aerospace Corporation has designed and developed such a package for nationwide distribution. The audio-visual package consists of three slide shows keyed to cassette tapes. An instructional manual and script come with the package. The topics explored in each slide show are "Make Success Your Game Plan", "The Re-Entrant Woman", and "Educational Preparation for Careers in Science". Write: Dodie Amundson, The Aerospace Corporation, 2350 E. El Segundo Blvd., El Segundo, CA 90247.

The Summer Institute for Women In Higher Education Administration is a residential program on the Bryn Mawr College campus offering women faculty and administrators intensive training in educational administration and management skills. The seventh annual such program will be held July 6 through July 30, 1982. Write: Summer Institute, Bryn Mawr College, Bryn Mawr, PA 19010.

National Forum, quarterly journal of Phi Kappa Phi, offers a stimulating presentation of articles on provocative, contemporary problems and significant, intellectual movements. Send \$10 to National Forum, Box 19420A, East Tennessee State University, Johnson City, TN 37614.

Women's Studies, Praeger Special Studies, Praeger Scientific, 521 Fifth Ave., New York, NY 10175.

Women's Studies, Yale University Press, 92A Yale Station, New Haven, CT 06520.

Women: An International Perspective; UNIPUB, 345 Park Ave. South, NY, NY 10010.

Frontiers: a journal of women studies. 3 issues per volume, \$12. Frontiers, Women Studies, University of Colorado, Boulder, CO 80309.

DEADLINES: July 23 for Sept.-Oct., Sept. 24 for Nov.-Dec., Nov. 24 for Jan.-Feb.
AD DEADLINES: Aug. 5 for Sept.-Oct., Oct. 5 for Nov.-Dec., Dec. 5 for Jan.-Feb.

ADDRESSES: Send all material except ads to Anne Leggett, Math. Dept., Western Illinois University, Macomb, IL 61455. Send everything else, including ads, to AWM, Women's Research Center, Room 204, Wellesley College, 828 Washington St., Wellesley, MA 02181.

Job Ads

Institutional members of AWM receive two free ads per year. All other ads are \$10.00 apiece and must be prepaid. The vacancies listed below appear in alphabetical order by state. All institutions advertising below are Affirmative Action/Equal Opportunity employers.

Purdue University. Department of Mathematics, West Lafayette, IN 47907. M. S. Baouendi, Head. Several regular or research assistant professorships beginning 8/1983. Exceptional research promise & excellence in teaching required. Send resume and 3 letters of recommendation by Jan. 15, 1983.

Purdue University. Department of Mathematics, West Lafayette, IN 47907. M. S. Baouendi, Head. One or two senior positions in applied mathematics (professor/associate professor with tenure). Salary competitive & negotiable. Excellent research credentials required. (Position (s) available for academic year 1983-84. Apply to M. S. Baouendi, Head.

Purdue University. Department of Mathematics, West Lafayette, IN 47907. M. S. Baouendi, Head. Possible one position at assoc. prof/prof level beginning Aug., 1983. Excellent research credentials required. Send resume & 3 letters of recommendation.

Benedictine College. Department of Mathematics. Computer science/mathematics position open Fall, 1982. To assist in developing undergraduate program in computer science and teach undergraduate courses in computer science/mathematics. Master's degrees in both computer science & mathematics preferred. Send resume, transcripts & 3 letters of recommendation to George Blodig, Dept. of Mathematics, Benedictine College, Atchison, KS 66002.

Kansas State University. Department of Mathematics. Asst. Professor temporary position for academic year 1982-83. Salary approximately \$14,000-\$24,000 for 9 month appointment commensurate with qualifications. Will consider candidates in all fields of mathematics. Expect strong interest in both teaching & research. Require Ph.D. in math or equivalent. By 7/15/82 contact R. Richard Summerhill, Dept. Head, Dept. of Math, KS State University, Manhattan, KS 66506.

Trenton State College. Dept. of Mathematical Sciences. One tenure track position starting Sept., 1982. Program Improvement Line in Computer Science. Required: Master's degree in Computer Science or Ph.D. in related area with expertise in computer science. (Candidate with masters will be expected to pursue doctorate.) Asst. Prof. or Assoc. Prof. dependent on qualifications. Salary range \$19,000 to \$27,000. By 8/2/82 apply to Dr. Yong Lee, Computer Science Coordinator, Dept. of Mathematical Sciences, Trenton State College, Hillwood Lakes, CN550, Trenton, N.J. 08625.

Cleveland State University. Department of Mathematics, Cleveland, OH 44115. T. W. Hungerford, Chairman. Tenure track or visiting position for Fall, 1982. Rank open. Required: Ph.D. with established record and/or strong potential in research. Commitment to excellence in teaching & broad undergraduate teaching interests are necessary. Normal teaching load: 2 courses per quarter. Competitive salary & excellent fringe benefits. Send vita & at least 3 letters of recommendation.

Vanderbilt University. Department of Mathematics. Subject to administrative approval one senior position in applied mathematics or classical analysis. Special title of Centennial Professor may be awarded. Duties begin in Jan. or Sept., 1983. International reputation in research is required as well as excellence in teaching. Have curriculum vitae & at least 4 letters of recommendation sent to Prof. R. R. Goldberg, Chmn., Dept. of Math, Vanderbilt University, Nashville, TN 37235.

Marshall University. Department of Mathematics, Huntington, W. V. 25701. At least one tenure track Asst. Professorship 8/31/82. Ph.D. required. Completed application, resume, transcripts, & 3 letters of reference due by 8/4/82. Official application forms must be used & can be obtained from Gerald E. Rubin, Math Search Committee (at above address).

Wesleyan University. Department of Mathematics. Junior tenure-track position in Computer Science, beginning Fall, 1983, possibly earlier. Area of specialization is completely open. Teaching responsibilities are two courses per semester. Please send vita & 3 letters of recommendation to: Anthony W. Hager, Mathematics Dept., Wesleyan University, Middletown, CT 06457.

ASSOCIATION FOR WOMEN IN MATHEMATICS
MEMBERSHIP APPLICATION

The AWM membership year is October 1 to
October 1.

Name and
Address _____

New _____ Renewal _____

Individual \$15.00 _____

Family \$20.00 _____

Retired, Student, Unemployed \$5.00 _____

New Member Rate: Individual,
for each of first 2 years \$10.00 _____

Institutional affiliation, if any _____

Institutional \$25.00 (Two free advertisements
in the Newsletter) _____

Make checks
payable to: ASSOCIATION FOR WOMEN IN MATHEMATICS

Contributing Member \$20.00 or more in
addition to regular dues _____

and mail to: Association for Women in Mathematics
Women's Research Center, Wellesley College
828 Washington Street
Wellesley, Massachusetts 02181

Association for Women in Mathematics
Women's Research Center, Wellesley College
828 Washington Street
Wellesley, Massachusetts 02181

July-August, 1982

NON-PROFIT ORG.
U. S. POSTAGE
PAID
BOSTON, MASS.
PERMIT NO. 12548

H K NICKERSON
184 WASHINGTON RD
PRINCETON

NJ 08540