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Undergraduate Mathematics in China

Lynn Arthur Steen

In June, at the invitation of the Chinese Mathematical Society and under the auspices of People-to-People International, a delegation of 56 U.S. and 2 Canadian mathematicians and 13 spouses visited the People's Republic of China. The delegation, led by former CUPM (Committee on the Undergraduate Program in Mathematics) Chairman Don Bushaw of Washington State University, represented all levels of undergraduate mathematics education and all regions of the U.S.

The delegation visited Beijing (Peking), Shanghai, and Guangzhou (Canton), each with several million residents, and Wuxi, Suzhou, and Hangzhou, smaller cities of about one million each. We visited universities, research institutes, technical schools, and middle schools, as well as the requisite tourist attractions. In many of the professional sessions, members of the delegation presented papers on various aspects of North American undergraduate mathematics education, and engaged in extensive discussions with Chinese

mathematics teachers. Delegates also talked with representatives of the Ministry of Education. These exchanges revealed a fragmentary picture of mathematics education in China, but suggest a pattern of intensity and specialization that is unlike anything in U.S. education.

China is a society in the midst of great change. It is less than 12 years since Richard Nixon re-opened U.S. relations with China—an act of political courage which the Chinese people still remember with frequent public appreciation—and only seven years since the deaths of Zhou Enlai and Mao Zedong, the end of the disastrous Cultural Revolution, and the overthrow of the "Gang of Four". In recent years, Deng Xiaoping and Hua Guofeng have moved forcefully to modernize China on four fronts: agriculture, industry, defense, and—most important for the mathematics education delegation—science and technology. Although China's population and poverty still exert an enormous drag on these "four modernizations", everyone we met—from hotel clerks to university professors—appeared to be encouraged about the direction (if not the speed) of change.

Education in China, including mathematics education, is designed to produce leaders for the four modernizations as efficiently and as rapidly as possible. Beginning with entrance requirements (influential parents or evidence of precocity)
(continued on page 2)



Leader Don Bushaw signs in for the Delegation at Fudan University in Shanghai as University Vice President Zhou Jin Qui and an interpreter look on.

Louisville to Host MAA Winter Meeting

The Sixty-Seventh Annual Meeting of the Mathematical Association of America will be held in the Commonwealth Convention Center and the Hyatt Regency Louisville in Louisville, Kentucky, from Wednesday, January 25, through Sunday, January 29, 1984. The meeting will be held in conjunction with the meetings of the American Mathematical Society and the Association for Women in Mathematics.

Highlights of the meeting may be found on page 5 of this issue. The preliminary meeting program, information about meeting arrangements, and preregistration and housing forms will be mailed to all MAA members in October.

China (continued from page 1)

for the few "key" kindergartens, access to every part of the formal educational system is controlled by examinations—only those who meet stringent intellectual, moral (often meaning "political") and physical criteria can proceed through the middle schools (grades 7-12) to the universities. The pattern of promotion through examination has a venerable history in China, echoing a nearly two-thousand-year tradition of imperial examinations for state office. In today's China these examinations shape the structure of higher education along selective (some might say elitist) lines:

- Fewer than 1% of China's college-age youth are admitted to universities and tertiary technical schools. (In the United States the comparable figure is about 30%.)
- Chinese universities offer few mathematics courses below the level of calculus. (In the United States nearly two-thirds of college mathematics enrollments are in courses below the level of calculus.)
- Chinese university students devote three-fourths or more of their time to their major fields; typically, the only courses outside the major department are politics (required), Chinese, physical education, and a foreign language, most often English. (In the United States, most students devote only one-third of their undergraduate time to their major field.)
- Undergraduate mathematics majors are generally required to take rigorous theoretical courses in analysis, algebra, and geometry, among others. (In the United States, few institutions still require all these courses for an undergraduate mathematics major.)
- Student-faculty ratios in the major universities are often 2 or 3 to 1, sometimes even 1 to 1; the average teaching load is one course. (In the United States, the average student-faculty ratio is about 20 to 1, with average teaching loads of 3-4 courses.)

The result of this intense specialization is an undergraduate mathematics major that is comparable in depth to the traditional U.S. master's degree, yet without the breadth of liberal arts usually associated with a U.S. bachelor's degree.

Mathematics plays a central role in many of China's educational policies. It is required of all students in every year of upper middle school (grades 10-12), and is included in the university entrance examinations for all students, both the exam for science students and the exam for those intending to major in humanities. Even apprentices at the National Embroidery Institute are required to study one year of mathematics as part of their training program.

Both university entrance examinations cover advanced algebra, trigonometry, and plane and solid geometry. Students in the prestigious "key" middle schools (with better teachers and facilities) prepare for these examinations by disciplined, rote learning, spare, old-fashioned classes, four columns by seven rows of desks, two students per desk, one-hour sessions, six days a week. To improve learning, mathematics classes meet only in the morning!

Many students in the ordinary middle schools (where the instruction is not as good and the demands are not as rigorous) as well as those not in school use widely-available self-study books to prepare for the university entrance exams. We observed several hotel clerks working trigonometry and geometry problems from these books in their idle moments. Informal quizzes in the universal language of mathematics revealed to our amazement that these clerks could solve quadratic and even factorable cubic equations!

Not all workers are at such an advanced level, however. China has two large and somewhat frustrated populations whose education is far below middle school standards: those whose schooling was interrupted by the cultural Revolution and those who are in rural school systems that frequently offer little beyond primary education. To help the millions of young people locked in this predicament, China has begun a TV university (trigonometry in prime time) and special "spare-time" schools. However, to conserve scarce university resources, the university entrance exam has recently been restricted to candidates under the age of 25. China is committed to catching up with the West by the year 2000; to this end, its best resources are concentrated on the brightest youth, and less intense educational opportunities are offered to the masses.

In our visits to universities and schools, our delegation saw much evidence of the severe limits on China's foreign currency. Except major research libraries, which were very strong, school and university libraries generally had few Western books or journals. Copies of the *Monthly*, for instance, are locally reproduced to save the cost of multiple subscriptions. Most rank-and-file university teachers are very intent on self-development, and very much want to be able to keep up on current mathematics research. Mathematicians with whom we talked expressed an urgent need for donations of current journals and conference proceedings; (continued on page 6)



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Enactment Likely for Major Science Education Measure

Peter Farnham

Science and mathematics education is now at the highest level of prominence in the national consciousness since the 1960's. It started last fall, when Congress essentially discovered the issue. Since then, several major—and very critical—reports have been released, which have fanned the flames of congressional interest. Furthermore, all announced and unannounced candidates for President, including the incumbent, have tried to seize the issue as a campaign centerpiece. Clearly, the time and effort spent by the many people who have talked about this issue for years has begun to pay off. In fact, there is now every indication that a major science and mathematics education bill will be signed into law by the end of the year.

Take the House. Acting with what some might consider uncharacteristic speed, it passed the "Emergency Mathematics and Science Education and Jobs Act and the National Engineering and Science Personnel and Jobs Creation Act of 1983" (H.R.1310) on March 2, 1983, a mere two months after introduction by Reps. Carl Perkins (D-KY) and Don Fuqua (D-FL), chairmen of the Education and Labor, and Science and Technology Committees, respectively. (See *FOCUS*, May-June 1983.)

Unfortunately, for some reason things are not moving as quickly in the Senate. Although the "Education for Economic Security Act" (S.1285) was reported out of the Labor and Human Resources Committee on May 11, it has yet to be dealt with on the Senate floor (this is expected shortly, however). S.1285 authorizes \$425 million in FY 1984, and \$540 million in FY 1985, for programs in science and mathematics education at both the National Science Foundation and the Department of Education (DOEd). It also establishes Presidential Awards for Teaching Excellence in Mathematics and Science, to be administered by the White House Science Office.

Title I of S.1285 establishes teacher institutes, to be funded by NSF grants to local education agencies applying jointly with an institute of higher education, and a program in which NSF, in conjunction with local education agencies and colleges and universities, helps develop teacher instructional programs and materials. Other Title I programs include Science and Mathematics Excellence in Teaching Awards, Congressional Merit Scholarships, and NSF Graduate Fellowships.

The largest program in the bill is authorized in Title II. This title establishes a DOEd program which makes financial assistance available to state and local education agencies and institutions of higher education to improve teacher skills in mathematics, science, computer learning, and foreign languages.

Title III establishes Partnerships in Education for Mathematics, Science and Engineering through which NSF matching grants can be used to supplement state and local education resources, and partnerships in education are encouraged between the business community, institutions of higher education, and elementary and secondary schools.

Finally, Title IV establishes a program of Presidential Awards for Teaching Excellence in Mathematics and Science; the President can make up to 100 such awards per year.

As one might gather from all this, H.R.1310 and S.1285 are clearly political documents. The bills specifically require equity in distributing any funds appropriated, especially so that underserved and disadvantaged populations will receive fair shares. Also, NSF and DOEd both receive substantial authorizations, thus pleasing both scientists and educators, two groups whose interests do not always coincide. Both *state* and *local* education agencies get funds. Finally, some of the funds are allocated according to population formula, while others are allocated by merit. Thus, the bills clearly try to please everybody.

As with anything that tries to please everybody, the bills have provided a fair amount of grumbling as well. Nevertheless, they are useful first steps in dealing with a long-neglected issue. As the 1984 election draws nearer even more attention will be focused on it.

Peter Farnham is the Administrative Officer of the Council of Scientific Society Presidents (CSSP). The views expressed here are his own and do not necessarily reflect official CSSP policy. The information in this article was current as of August 11, 1983.

News from the National Science Foundation

Guidelines for the NSF **Honors Workshops for Precollege Science and Mathematics** and **Materials Development for Precollege Science and Mathematics** programs are now available. (See *FOCUS*, May-June 1983 for a description of these programs.) To receive copies of the guidelines, send a self-addressed mailing label to NSF Office of Scientific and Engineering Personnel and Education, 1800 G Street, N.W., Washington, D.C. 20550. There is no deadline for submission of proposals to either program.

NSF is seeking proposals from prospective host institutions in the U.S. for five-day regional conferences, the **NSF-CBMS Regional Conferences in the Mathematical Sciences**, each to feature ten lectures by a distinguished lecturer on a subject of current research interest in the mathematical sciences. The conferences should be planned for a summer week in 1984 (not earlier than May 1) or held during a recess in the succeeding academic year.

Inquiries regarding details of proposals for these conferences should be addressed to the Conference Board of the Mathematical Sciences, 1529 Eighteenth Street, N.W., Washington, D.C. 20036. The deadline for receipt of proposals by NSF is November 15, 1983.

A new program of research awards, entitled **Presidential Young Investigator Awards**, will provide cooperative research funds from \$25,000 to \$100,000 per year for up to five years to a maximum of 200 young (no more than seven years beyond the Ph.D.) science and engineering faculty members each year. This program, initiated by NSF at the request of President Reagan, is expected to help universities meet the wide demand for highly qualified personnel for academic and industrial research and for teaching. For further information, write to Presidential Young Investigator Awards, National Science Foundation, Room 414, 1800 G Street, N.W., Washington, D.C. 20550.

William G. Rosen, Head of the Mathematical Sciences Section of NSF since 1979, has been named Deputy Executive Director of the U.S.-Israel Binational Science Foundation in Jerusalem.

U.S. Places 2nd in IMO

Spearheaded by first-prize medalist Michael Reid of Brooklyn, New York, the U.S. team placed 2nd in the 1983 International Mathematical Olympiad (IMO), held July 6-7 in Paris. The five top teams and their scores were: West Germany (212), U.S.A. (171), Hungary (170), U.S.S.R. (169), and Romania (161).

One hundred ninety-two secondary school students from 32 countries participated, the largest number ever in the IMO's 25-year history. Each team had six members. There were two sets of three problems (4½ hours for each set!), with a possible score of 7 on each problem. This year four students received perfect scores, three from West Germany and one from U.S.S.R.

In alphabetical order, the five other U.S. Team members were: Douglas S. Jungreis (North Woodmere, New York), Jeremy A. Kahn (New York City, New York), Steven Newman (Ann Arbor, Michigan), John Steinke (San Antonio, Texas), and C. James Yeh (Mountain Brook, Alabama). All received second or third place prizes.

As usual, the team was selected through the examinations of the MAA Committee on High School Contests. The results of the first-round American High School Mathematics Examination (AHSME) were reported in the May-June 1983 *FOCUS*. From the AHSME, 1823 students went on to take the second-round American Invitational Mathematics Examination (AIME) on March 22. The top 54 students on the AIME, which is a new examination this year, were then invited to take the U.S.A. Mathematical Olympiad (USAMO) on May 3. The top eight were declared Winners. The Winners were the six students named above, plus Douglas R. Davidson (McLean, Virginia) and John T. O'Neil III (Princeton, New Jersey). The eight winners and their parents were brought to Washington on June 6-7 for the distinctive USAMO Awards Ceremonies which include a dinner at MAA Headquarters, speeches and awards at the National Academy of Sciences, and a banquet

at the elegant Diplomatic Reception Rooms of the Department of State.

Following the USAMO Awards Ceremonies, the Winners and 14 other USAMO participants attended a three-week IMO training session at the U.S. Military Academy at West Point. The purpose of the session was to prepare the U.S. Team for the IMO and train younger students who will be eligible in later years. The "trainers" were Professors Murray Klamkin and Andrew Liu, both of the University of Alberta, who also accompanied the team to France.

Last year the U.S. IMO Team was 3rd (behind West Germany and the U.S.S.R.); the year before it was 1st. This year's turnaround is especially sweet because the team was inexperienced. Only one member (Jungreis) had been on a previous IMO Team. However, three additional members (Kahn, Newman, Steinke) attended last year's training session.

Various publications on these examinations are available. There is a detailed summary of U.S. and Canadian AHSME and AIME results (\$1.50) which many college mathematics departments use to identify able students who might be encouraged to apply. One can also obtain the problems and solutions for the 1983 AHSME (40¢), AIME (50¢), and the USAMO/IMO (50¢ together). The AHSME and Olympiad booklets are available for several past years as well. To place an order (minimum \$4), or to pre-order next year's Summary Booklet, write to: Professor Walter E. Mientka, Executive Director, MAA Committee on High School Contests, Department of Mathematics and Statistics, University of Nebraska, Lincoln, NE 68588-0322.

The sponsors of the U.S. exams are the MAA, the Society of Actuaries, the National Council of Teachers of Mathematics, Mu Alpha Theta, and the Casualty Actuarial Society. The USAMO Awards Ceremony is made possible by a grant from IBM. Various prizes are provided by Hewlett-Packard and several book publishers. The IMO training session and the U.S. IMO Team are funded by the Army Research Office and the Office of Naval Research.



USAMO winners Steven Newman and Jeremy Kahn at the USAMO Awards Ceremony Banquet on June 7, 1983, puzzling over an unsolved problem posed by Ronald L. Graham, Bell Telephone Laboratories, in his address to the winners.

Sloan Awards Grants for Discrete Mathematics

The Alfred P. Sloan Foundation has awarded a grant of \$20,000 to fund a new MAA panel, Panel on Discrete Mathematics in the First Two Years. This panel plans to produce in two years a report similar in purpose to the recent MAA report *Recommendations for a General Mathematical Sciences Program*. It will describe existing programs incorporating discrete mathematics in the first two years of undergraduate mathematics study and will propose further syllabi for other schools to try. The panel chairperson is Martha Siegel of Towson State University. Colleges or universities that are already making changes to increase the role of discrete mathematics in the first two years are requested to provide Professor Siegel with information about their programs.

The Sloan Foundation has also announced grants of \$40,000 each to six institutions to develop a new mathematics curriculum involving more discrete mathematics. The funded institutions and their project directors are: Colby College, Donald Small; University of Delaware, Ronald Baker; University of Denver, Ronald Prather and Herbert Greensberg; Florida State University, John Bryant; Montclair State College, Kenneth Kalmanson; St. Olaf College, Loren Larson.

All six of these institutions are planning programs in which continuous mathematics (calculus of one and several variables) and discrete mathematics (including linear algebra) receive about equal time, one year of study; however, their programs differ significantly in how this study is arranged. As there is currently little text material for discrete mathematics at this level and in this context, most of the funded schools are planning to write their own texts.

MAA Panel Releases New Teacher Training Recommendations

In response to the changing needs of precollege mathematics education in the 1980's, the MAA Committee on the Undergraduate Program in Mathematics (CUPM) has released new recommendations for pre-service preparation of teachers of mathematics. The recommendations are contained in a report of the CUPM Panel on Teacher Training, published this summer as a second volume of the new series *MAA Notes*. Entitled *Recommendations on the Mathematical Preparation of Teachers (MAA Notes #2)*, the report is now available for purchase from the MAA. (See the advertisement on this page.)

The new guidelines build on earlier similar CUPM recommendations which were widely disseminated and discussed in the 1960's and early 1970's with the aid of grants from the National Science Foundation. These recommendations had a significant effect on the evolution of teacher preparation in mathematics during those years.

The Panel on Teacher Training was reactivated by CUPM in 1979 to re-examine the recommended curriculum in light of the special needs of the 1980's. The report of the panel, the product of several years of meetings and wide consultations, does not represent a major departure from the earlier recommendations, but rather a fine tuning to today's special needs. It recommends increased emphasis on applications of mathematics and problem-solving and reflects recent evolution in the content of college mathematics and the increased availability of computers.

The panel made considerable use of recent reports by the National Council of Teachers of Mathematics (NCTM) on the changing priorities of mathematics education. In fact, the panel's recommendations may be regarded as an effort by the mathematical community to interpret the *NCTM Guidelines for Preparation of Teachers* (1981) in concrete curricular terms.

While the recommendations are addressed primarily to the college curriculum for prospective mathematics teachers, the panel notes that they may also be useful in designing in-service programs for teachers of mathematics and in-service programs for teachers who are certified in other areas and wish to become mathematics teachers.

The MAA will mail copies of the report to all mathematics department chairs in the United States and Canada and to all state supervisors of mathematics to insure wide dissemination of the recommendations.

Other recent MAA publications related to these recommendations are *Problem Solving in the Mathematics Curriculum* (\$5, prepared by the MAA Committee on the Teaching of Undergraduate Mathematics) and *Mathematics Appreciation Courses* (\$1, prepared by a panel of CUPM). These publications may also be ordered from the MAA's Washington office.

Highlights of the National MAA Meeting in Louisville

The MAA Annual Meeting to be held January 25-29, 1984, in Louisville, Kentucky, will feature a Retiring Presidential Address by Richard D. Anderson, invited addresses on a variety of interesting topics, a panel discussion on retraining to teach computer science, and eight minicourses.

The title of Professor Anderson's address is *Reflections on the Mystique of R.L. Moore*. The invited addresses will be: *Some Examples of Combinatorial Averaging*, Herbert S. Wilf, University of Pennsylvania; *Mathematics in Industry-How Do Problems Arise?*, Henry O. Pollack, Central Staff Organization for the Regional Bell Operating Companies; *Computational Geometry: Paradigms and Applications*, Frances Yao, Xerox Corporation; *Beta and Gamma Functions from Euler to Selberg and Beyond*, Richard Askey, University of Wisconsin; *Turning Good Mathematics into Good TV*, Ross L. Finney and Donald Berman, COMAP; *Non-Expansive Maps*, Andrew Gleason, Harvard University; and *The Computer as a Grader*, Melvin Maron, University of Louisville.


The topics and organizers of the eight minicourses are: *Linear Programming*, Charles E. Haff, University of Waterloo; *Combinatorics*, Fred S. Roberts, Rutgers University, and Stephen B. Maurer, Swarthmore College and the Alfred P. Sloan Foundation; *Problem Solving*, Alan H. Schoenfeld, University of Rochester; *PASCAL*, Harley Flanders, Florida Atlantic University; *Mathematics in Industry*, Jeanne L. Agnew and Marvin S. Keener, both of Oklahoma State University; *Computer Graphics*, Joan Wyzkoski, Bradley University; *CONDUIT Microcomputer Software*; *Non-CONDUIT Microcomputer Software*.

As noted on page 1 of this issue, the preliminary meeting program, information about meeting arrangements, and pre-registration and housing forms will be mailed to all MAA members in October.

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Putnam Competition to be Held December 3

The 4th Annual William Lowell Putnam Mathematical Competition will be held at participating institutions on Saturday, December 3, 1983. This competition is supported by the William Lowell Putnam Prize Fund for the Promotion of Scholarship and is administered by the Mathematical Association of America.

All colleges and universities in Canada and the United States may register eligible undergraduates for the Putnam Competition. Registration forms will be mailed to institutions that participated in the 43rd competition by September 23, 1983. Other institutions that wish to enter undergraduates should request registration forms from Professor L. F. Klosinski, Director, The William Lowell Putnam Mathematical Competition, University of Santa Clara, Santa Clara, CA 95053. Completed registrations must be received by the Director no later than October 14, 1983.

Further details are given in the Announcement Brochure that is mailed with the registration material. Reports of previous competitions, including examination questions and outlines of solutions, may be found in past issues of the *American Mathematical Monthly*. The most recent of these reports appeared in the issues of November 1982, October 1981, October 1980, and November 1979.

China (continued from page 2)

requests through the bureaucracy for subscriptions or purchase orders can take years.

The availability of computers has suffered also, both from China's lack of foreign currency and because of restrictions on export of computer technology from the West (especially from the U.S.). Most universities have a few imported microcomputers (we saw Cromemco, Commodore, and Apple, and heard of others) and one or two minicomputers. Some of the latter were locally produced based on technology from the early 70s, and looked to us like museum pieces. We were told that there were five computers (Apples) in upper middle schools in all of China. Despite this severe shortage, several comprehensive universities offer specialization in computer science, either as a major or as a program within the mathematics department. The use of computers as instructional aids (especially CAI) is virtually unknown in China. Our delegates' presentations in this area produced much astonishment and much consternation among the translators who had to invent new Chinese terms on the spot.

Both in middle schools and in universities, the mathematics curriculum follows the traditional route of pure, classical mathematics. The newer applied topics enter only as advanced courses or, sometimes, in separate departments of applied mathematics. For the most part, applied mathematics in China is a post-functional analysis, research-oriented endeavor. What in the U.S. is called applications of undergraduate mathematics is in China called "popular" or "practical" mathematics—mathematics for the people. The chief proponent and practitioner of these applications is China's pre-eminent mathematician Hua Luogeng, Vice President of the Chinese Academy of Sciences and Director of both the Pure and Applied Mathematics Research Institutes in Beijing. Yet despite such high-level support, most mathematics teachers at universities show little enthusiasm for practical mathe-

matics because it is tainted with reminders of the Cultural Revolution when so many intellectuals were forced to work in the countryside or in the factories.

When students finish their undergraduate program, they are assigned to a job by one of the agencies that sponsors their university—the Ministry of Education in Beijing for national universities, or provincial ministries for provincial universities. Student preference seems to be for placement in research institutes or in postgraduate study; as in the U.S., and for many of the same reasons, middle school teaching is at the bottom of the prestige ladder. Placement is based largely upon scores on examinations, students with the best scores being more likely to be assigned to desirable positions. The top candidates either become research assistants or are enrolled as postgraduate students; others are assigned as "assistants" in colleges and universities (like U.S. teaching assistants but full time, without formal enrollment in a graduate degree program) or as members of an industrial team that needs someone with mathematical skills. Even graduates of the teachers colleges often do not go into the middle school classroom; frequently the best graduates are assigned as college teachers (with no further graduate training) at the same institution from which they graduated.

Graduate study in China vanished during the Cultural Revolution, and only now is making a slow comeback. A few major universities now have both master's and doctoral programs on the books, but usually they have few students. We were told that in recent years there were 5 students in all of China who received a Ph.D. in mathematics, and 4 of them were from Fudan University in Shanghai. Of course, quite a few Chinese graduate students are studying abroad, mostly in the United States. As they return and are assigned to positions in Chinese universities, the pace of Chinese graduate education will certainly quicken.

Previous mathematics delegations to China reported receiving heavy doses of ideology in repeated speeches linking mathematics to dialectical materialism. We heard practically none of this: the Chinese who addressed us, as well as those with whom we spoke, separated politics from mathematics as Americans separate church and state. Politics is, of course, often present just beneath the surface—in requirements of "moral standing" for university admission, in required courses in politics, and in the social control that permeates Chinese life and work. Nevertheless, Chinese rhetoric has now shifted from ideology to pragmatism, and mathematics (even pure mathematics) is now justified in its own terms rather than as a derivative of dialectics.

Despite severe economic and historical handicaps, China is moving rapidly into a new era of mathematics education that stresses basic mathematics as the foundation for its fourth modernization, science and technology. The pace of change is accelerating, and should be interesting to observe.

Lynn Arthur Steen, Professor of Mathematics at St. Olaf College in Northfield, Minnesota, was assistant leader of the Mathematics Delegation to China. He is Secretary of Section A (Mathematics) of the American Association for the Advancement of Science (AAAS) and former First Vice President of the MAA. Two further and more comprehensive reports concerning the delegation's observations will be available by the end of the year: a comprehensive daily journal being edited by Don Bushaw, and an analytical study of issues being edited by Lynn Steen.

People in the News



David Blackwell, Professor of Statistics at the University of California at Berkeley, has been selected by CIBA-GEIGY Corporation for its 1983 Exceptional Black Scientists Poster Series. The poster series was created to acquaint the general public with the accomplishments of black scientists and to encourage more minority students to pursue careers in science, medicine, and mathematics. Dr. Blackwell specializes in the fields of set theory and theory of games.



Peter Hilton, Professor of Mathematics at the State University of New York at Binghamton, has recently received an honorary Doctor of Science degree from the Memorial University of Newfoundland. Professor Hilton is widely known in the mathematical community not only for his research contributions in the fields of algebraic topology and homological algebra but also for his concern about mathematics education at the secondary and collegiate levels. In August, the Memorial University of Newfoundland sponsored an international conference on algebraic topology and homological algebra in celebration of Professor Hilton's 60th birthday.



David P. Roselle, Dean of Research and Graduate Studies at Virginia Polytechnic and State University, has been named Provost of that institution effective July 1, 1983. In announcing the appointment, University President William E. Lavery said, "Dr. Roselle has demonstrated excellent administrative leadership, strong teaching skills and outstanding scholarship, as well as national leadership in professional associations. He has a deep understanding of the University, of the land-grant mission, and of higher education in the commonwealth. His commitment to academic excellence and his unusual ability to bring incisive judgment and perception to that commitment will serve the University well in his new position of academic leadership."

Dr. Roselle joined the Virginia Tech faculty as a Professor of Mathematics in 1974 after teaching at the University of Maryland and Louisiana State University. He is well-known to MAA members as the Secretary of the Association, a post he has held since 1975.

Richard Schoen, University of California at Berkeley, and **Karen Uhlenbeck**, University of Chicago, are among the 14 new fellows to receive no-strings grants from the MacArthur Foundation. Professor Schoen will receive \$172,000 over the next five years. Professor Uhlenbeck will receive \$204,000. Schoen, the sixth Berkeley faculty member to win a MacArthur Foundation award, has been working on global nonlinear partial differential equations with applications to differential geometry. Uhlenbeck's work is in foundations of high-energy theoretical physics and topology in four dimensions.

Marshall Stone, Professor Emeritus of Mathematics at the University of Massachusetts, Amherst, was recently awarded the National Medal of Science. The medal, the country's highest scientific award, was presented by President Reagan to honor Professor Stone's outstanding contributions in mathematical research.

Wisconsin Section Plans Fall Workshop on Discrete Mathematics

The MAA Wisconsin Section will hold a Fall Workshop on October 28-29, 1983, at the University of Wisconsin-Madison. The topic of the workshop will be "Discrete Mathematics and Its Role in the First Two Years of the Undergraduate Curriculum."

For more information, contact Professor Richard L. Poss, Department of Mathematics, St. Norbert College, DePere, WI 54115 (414-337-3198).

Changes in the VLC Brochure Announced

The MAA's Committee on Visiting Lecturers and Consultants (VLC) has announced the following changes in its 1982-84 program brochure: **Richard Aló (C)** New address: Department of Applied Mathematics, University of Houston-Downtown, 1 Main Street, Houston, TX 77002. **Allan Butterworth (L)** passed away April 7, 1983. **Stephen Maurer (L)** Use the Sloan Foundation address listed in the brochure. **Gary Meisters (L)** will be unavailable during 1983-84. **Elmor Peterson (C)** is now in the *Mathematics* Department (no institution change). **Seymour Schuster (L)** Address for *fall semester* only: Department of Mathematics and Computer Science, Western Washington State University, Bellingham, WA 98225. The following corrections (italics) should also be noted. **Gerald Shedler (L)** K51-281; Zip Code: 95193. **Karl Smith (L)** Santa Rosa.

Copies of the VLC brochure are mailed each September to all mathematics department chairmen. Additional copies may be obtained from the Mathematical Association of America, 1529 Eighteenth Street, N.W., Washington, D.C. 20036.

Call for Applications and Nominations

Coordinator of Government Relations for the Mathematical Sciences

A new position has been authorized by the governing bodies of the AMS, MAA, and SIAM, to be under the direction of the Joint Concerns Committee for Mathematics. The appointment is half-time during the academic year and full-time during the summer. The position will continue for at least one year, starting January 1, 1984.

The coordinator must be prepared to spend a considerable amount of time in Washington, D.C.—one or two trips a week, if he or she does not live in the Washington area.

The following are important qualifications for the job: stature and broad acquaintanceship in the mathematical sciences community; good understanding of political and legislative processes in the Federal Government; awareness of and concern about the problems facing the mathematical sciences community with regard to mathematics education, funding of research, and nurture of mathematicians. Salary will be commensurate with background and experience.

Applications and nominations should be sent to: Joint Concerns Committee for Mathematics, % American Mathematical Society, PO Box 6248, Providence, RI 02940 and must be received by October 31. Names of suitable references should be provided.

Congressional Science Fellowship Applications Invited

Applications are invited from candidates in the mathematical sciences for a Congressional Science Fellowship for the twelve-month period beginning September 1, 1984. The fellowship is supported jointly by the American Mathematical Society, the Mathematical Association of America, and the Society for Industrial and Applied Mathematics. It is one of some thirty similar fellowships supported by scientific societies in a program administered by the American Association for the Advancement of Science. Congressional Science Fellows spend their fellowship year working on the staff of a member of Congress or on the staff of the Congressional

Office of Technology Assessment.

The 1984-85 stipend for the AMS-MAA-SIAM Fellowship is \$26,000. The stipend may be supplemented by a small amount toward relocation and travel expenses and possibly even by sabbatical salary or other employer contributions.

The 1983-84 Fellow is Charles G. Bird, a Staff Research Scientist in the Mathematics Department of the General Motors Research Laboratories.

Application forms may be obtained by writing to the Conference Board of the Mathematical Sciences, 1529 Eighteenth Street, N.W., Washington, D.C. 20036. The deadline for receipt of completed applications is January 1, 1984. The award will be announced by February 15, 1984.

Calendar

National MAA Meetings

67th Annual Meeting, Louisville, Kentucky, January 25-29, 1984.

68th Annual Meeting, Anaheim, California, January 11-13, 1985.

70th Annual Meeting, San Antonio, Texas, January 23-25, 1987.

Sectional MAA Meetings

Eastern Pennsylvania and Delaware Bryn Mawr College, Bryn Mawr, Pennsylvania, November 19, 1983.

Indiana Indiana-Purdue University at Fort Wayne, Fort Wayne, Indiana, October 15, 1983.

Louisiana-Mississippi Southeastern Louisiana University, Hammond, Louisiana, February 17-18, 1984.

Maryland-DC-Virginia University of the District of Columbia, Washington, D.C., November 18-19, 1983.

New Jersey Kean College of New Jersey, Union, New Jersey, November 5, 1983.

North Central South Dakota State University, Brookings, South Dakota, October 28-29, 1983.

Northeastern Providence College, Providence, Rhode Island, November 18-19, 1983.

Northern California San Francisco State University, San Francisco, California, February 25, 1984.

Ohio Baldwin-Wallace College, Berea, Ohio, November 4-5, 1983.

Seaway Niagara University, Niagara, New York, November 4-5, 1983.

Other Meetings

SEPTEMBER 1983

23-24. **Eleventh Annual Mathematics and Statistics Conference—Operations Research and Mathematics as Applied in Business**, Miami University. Speakers: William Lucas, Harvey Wagner, Tom Shriber. Contact: Stan Payne, Department of Mathematics and Statistics, Miami University, Oxford, OH 45056.

23-24. **Annual Student Conference of the Ohio Delta Chapter of Pi Mu Epsilon**, Miami University. Contact: Milton Cox, Department of Mathematics and Statistics, Miami University, Oxford, OH 45056.

OCTOBER 1983

13-15. **22nd Annual Northwest Mathematics Conference**, Seattle, Washington. Contact: Richard Spangler, Tacoma Community College, Tacoma, WA 98465.

14-16. **Annual Meeting of the Dozenal Society of America**, Nassau Community College. Contact: Professor Gene Zirkel, Department of Mathematics, Nassau Community College, Garden City, NY 11530. (516-222-7611 or 516-669-0273.)

18-20. **IEEE Educational Computing Conference—Applying Technology to Education in the Next Ten Years**, Silicon Valley, California. Contact: M. Dundee Maples, Educational Computing Conference Co-chairman, P.O. Box 535, Cupertino, CA 95015. (408-252-3224.)

24-26. **Association for Computing Machinery Annual Conference**, Sheraton Centre Hotel, New York City. Contact: Mr. Thomas A. D'Auria, ACM '83 Conference Chairman, Assistant Commissioner, City of New York, Computer Service Center, 111 8th Avenue, 11th Floor, New York, NY 10011. (212-620-5055.)

28-29. **Fall Workshop of the MAA Wisconsin Section—Discrete Mathematics and Its Role in the First Two Years of the Undergraduate Curriculum**. (See "Wisconsin Section Plans Fall Workshop on Discrete Mathematics" on page 7 of this issue.)

NOVEMBER 1983

7-9. **Joint National Meeting of the Operations Research Society of America and The Institute of Management Sciences**, Orlando, Florida. Contact: ORSA, 428 East Preston Street, Baltimore, MD 21202.

7-9. **Society for Industrial and Applied Mathematics Fall Meeting**, plus a special conference on parallel processing, November 10-11, Norfolk, Virginia. Contact: SIAM, Suite 1405, 117 South 17th Street, Philadelphia, PA 19103.

10-13. **American Mathematical Association of Two-Year Colleges Annual Convention**, Orlando, Florida. Contact: Bill Jordan, AMATYC Convention Chairman, Seminole Community College, Sanford, FL 32771. (305-323-1405.)

DECEMBER 1983

5-7. **Second series of Everett Pitcher Lectures**, Lehigh University. Lecturer: Jean-Pierre Serre of the College de France. Contact: Department of Mathematics, Lehigh University, Christmas-Saucon Hall 14, Bethlehem, PA 18015.

27-30. **Annual Meeting of the Association for Symbolic Logic**, held in conjunction with the American Philosophical Association Meeting, Boston, Massachusetts. Contact: ASL, P.O. Box 6248, Providence, RI 02940.

JANUARY 1984

25-29. **90th Annual Meeting of the American Mathematical Society**, Louisville, Kentucky. Contact: AMS, P.O. Box 6248, Providence, RI 02940.

25-29. **Meeting of the Association for Women in Mathematics**, Louisville, Kentucky. Contact: AWM, Women's Research Center, Wellesley College, 828 Washington Street, Wellesley, MA 02181.

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